

# Exploring the Relationship between Falls in Long Term Care and Psychoactive Prescribing

L.D. Hughes

NES GP Academic Fellow, University of St Andrews, United Kingdom

Corresponding Author: Lloyd Hughes, University of St Andrews Bute Medical School, University of St Andrews School of Medicine, United Kingdom, [lloyd.hughes@nhs.scot](mailto:lloyd.hughes@nhs.scot)

## Abstract

Almost half of patients of nursing home residents experience one fall per year. Falls have associated significant morbidity and mortality, and a proportion of falls can be deemed avoidable. There are a variety of risk factors associated with falls, many of which are not modifiable. There has been increasing focus upon the relationship between psychotropic medications and falls as this is seen a potentially modifiable risk factor. This article reviews some of the clinical challenges about balancing falls risk mitigation strategies with the management of behavioral and psychological symptoms of dementia.

*Key words:* Neuroleptics, prescribing, long-term care, nursing homes, falls.

system (3). In 2016 an observational study of over 2000 nursing home residents reported a 3-fold increase in fall incidence in residents receiving scheduled doses of psychotropic medications, with increased risk even for patient receiving medications on an as required basis (7). The relationship between falls and psychoactive prescribing is particularly important as older people are commonly prescribed medications with psychoactive properties (3). Indeed, Guthrie et al showed that patients with dementia in Scotland have a 17% chance of being prescribed one or more psychoactive medications (including antipsychotics, antidepressants and hypnotic/anxiolytics) (8). More broadly, a study analyzing nursing home psychoactive prescribing in 12 European countries reported rates of antipsychotic prescribing of between 12% to 59% and antidepressant prescribing of 19% to 68% (9).

## Introduction – Geriatric Falls in Nursing Homes

Over 40% of nursing home residents experience at least one fall each year (1). A fall is generally defined as ‘an event that leads to a person coming to rest on the ground or other lower level’ (2). Indeed, falls and falls related injuries such as neck of femur fractures are leading problems in residential aged care facilities (3) and are associated with significant morbidity and mortality (1, 2) alongside significant carer and patient anxiety about future falls (4). Falls can also threaten the independence of older people and may be responsible for an individual’s loss of independence and socioeconomic consequences (5). There are a variety of risk factors associated with falls in elderly patients including previous history of falls, altered gait due to physical health pathology, higher rates of dependency, cognitive impairment, psychoactive medication use and excessive physical activity (6).

## Psychoactive Prescribing – a modifiable falls risk factor?

There is increasing awareness of the relationship that psychoactive prescribing may have upon residents’ risk of falls, which is seen as a potentially modifiable risk factor. Psychoactive medications are defined as agents that affect mood, perception, cognition, behavior, or consciousness as a result of changes in the functioning of the central nervous

## Neuropsychiatric Symptoms & Psychoactive Prescribing in Nursing Home Residents

A significant reason for the high rates of psychoactive prescribing in this patient group is that patients in nursing homes are generally frail, multimorbid and experience neuropsychiatric symptoms at significant rates. A systematic review, indicated that 82% of residents of nursing homes exhibited at least one neuropsychiatric symptoms, with agitation and apathy being most prevalent (10). The prevalence of specific behavioral and psychological symptoms of dementia (BPSD) was the focus of a recent systematic review, which reported rates of specific symptoms low prevalence (4% for elation and mania) to higher prevalence (32% for apathy) with varying symptoms identified depending on dementia sub-type (11). The authors reported that apathy, depression, anxiety, irritability, agitation and aggression were common individual BPSD symptoms in patients with Alzheimer’s disease, and depression and agitation and aggression were common in patients with multi-infarct dementia (11). This review focused upon community-dwelling adults with dementia, with rates known to be significantly higher in patients in long-term care (12).

These symptoms affect both the quality of life of residents and the work-load of nursing staff (13). Guidelines routinely suggest non-pharmacological interventions as the first-line therapy for neuropsychiatric symptoms, due to the side effect profile of these medications, but there is a significant gap

between guideline recommendations and practice within nursing homes (14). The prescribing of psychotropic agents is primarily to relieve symptomatic distress associated with neuropsychiatric symptoms which can be significant for patients, staff and carers. Furthermore, there have been well documented challenges to delivering effective non-drug strategies to manage neuropsychiatric symptoms in long term care facilities (15).

However, despite good intentions research suggests that only 10% of psychotropic drug prescriptions for neuropsychiatric symptoms are fully appropriate for residents with dementia, in terms of indication, evaluation, dosage, drug-drug interactions, drug-disease interactions, duplications, and therapy duration (16). The use of psychoactive medications, particularly antipsychotic medications, are associated with an increased risk of mortality, hip fractures and falls, thrombotic and cardiovascular events, cognitive decline and hospitalizations (17-19). Among adverse reactions secondary to psychotropic medications falls are particularly feared, due to falls being a major predictor of admission to hospital, and functional dependence (20).

### Psychoactive Prescribing & Falls

Balance and gait require coordination between numerous body systems and organs, with the nervous system involved at all levels. Psychoactive prescribing is an important culprit in impairing the process of coordination. There has been extensive work looking more deeply at the relationship between psychoactive prescribing and falls. A Spanish study utilized data from 4502 residents living in 41 nursing homes belonging to a Spanish nursing home chain, where there were a total of 490 falls over the one month study period (21). Two-thirds of the study population were prescribed psychotropic medications, with the paper reporting increased risk of injurious falls with typical neuroleptics, atypical neuroleptics and long half life benzodiazepines with odds ratios ranging from 1.42 – 2.57 respectively (21). Furthermore, a Dutch study of 1,415 residents, with a combined number of 698,567 patient-days and 3,879 fall incidents reported the risk of falling appeared to increase with the use of both typical and atypical antipsychotics, hypnotics and sedatives, antidepressants and anxiolytics, with adjusted hazard ratios (aHR) varying between 1.39 and 1.73 (22). Of particular interest was the isolation of higher risk medications with links to falls including: zolpidem (aHR 2.35), melatonin (aHR 1.97), quetiapine (aHR 1.99), temazepam (aHR 1.96), zopiclone (aHR 1.81) and haloperidol (aHR 1.54). Although there is evidence that some medications are associated with higher risk which is clinically useful, it is not the case that preferential prescribing of short-acting benzodiazepines instead of long-acting agents or atypical neuroleptics rather than typical neuroleptics will substantially decrease fall risk associated with the use of these medications (23).

### A Paradox – Mitigating Falls Risk and Managing BPSD

How can we manage the paradox between the high burden of neuropsychiatric symptoms and adverse drug reactions associated with medications prescribed to alleviate symptoms?

Firstly, we have a duty to utilize non-drug approaches to neuropsychiatric symptoms and support the provision of these wherever possible. Systematic reviews have identified a wide array of different approaches to mitigate BPSD including specific indirect interventions (e.g., professional development of staff, light focused) to specific direct interventions (e.g., art and theatre, animal based) (24, 25). The effectiveness of these interventions vary extensively between studies, highlighting that focused reviews of different specific nursing home contexts which may account for the successes, failures or partial successes of the interventions. At present there are no specific approach which is recommended, but promoting a caring environment for residents, individualization of care for residents to promote patient centered care and education for staff regarding BPSD management are all pertinent themes for the long-term care industry (24). Furthermore, time spent developing therapeutic relationships between care providers, the care recipients and the family members can be another way to promote meaning and purpose for patients with dementia in long term care facilities.

Secondly, it is pertinent to consider the reasons why psychotropic prescribing rates are high relative to their effectiveness. These may include physician and nurse attitudes to neuropsychiatric and psychotropic drugs and pressure placed on clinicians to prescribe these medications (26). Symptoms of BPSD can be very distressing to nursing home staff and family members, and often stimulate an urgent need to ‘do something’, which can make it difficult to have a nuanced discussion about side effect profiles. This conversation regarding risks of medication prescribing is vital to make an informed choice, with Dutch research reporting that almost 50% of family members feel poorly informed about the side effects of prescribed psychotropic medications (27). More broadly, care providers knowledge or experience of neuropsychiatric syndromes, the interpersonal skills of nurses, communication or cooperation between professionals and with family members, alongside external factors (e.g., staffing, accessibility to medical support, funding streams and local policies) all may play a role in higher rates of psychoactive prescribing (28). The provision of educational support, time to deliver nursing home medication reviews and financial incentives for particular prescribing outcomes may all facilitate safer psychoactive prescribing.

Thirdly, involvement of a clinical pharmacist within primary care teams to support decision making around psychoactive prescribing has been advocated an approach to support clinicians appropriately start medications, review and stop medications (29-31). The support of pharmacists may enable general practitioners, especially for particularly complex cases, decide on appropriate psychoactive prescribing, identify key risk factors to discuss with family members alongside likelihood of benefit and arrange appropriate

review after medications are started. However, even with the support of pharmacy teams, careful consideration should be given before psychotropic polypharmacy is implemented (i.e.  $\geq 3$  psychotropics), possibly with early involvement of psychogeriatric team members / dementia liaison teams if this is required (32). Presently it is difficult to be definitive about the nature of the impact of pharmacy interventions for long-term care facility prescribing, with the limited evidence to date relating more to methodological factors rather than true lack of efficacy (33, 34). Further research is strongly advocated for with standardization of key outcome measures. Integration of pharmacy teams, alongside other health professionals, is becoming an important component of primary care reform in Scotland to support general practitioners.

## Conclusion

Psychiatric conditions and symptoms are common in older age, and even more so in long term care facilities, and this is reflected by the high rates of psychoactive prescribing. There are significant challenges providing appropriate, rationalized and effective psychoactive prescribing for patients, and evidence to date suggest that patients are experiencing significant harm due to the over-use of these agents. Falls in particular are associated with significant mortality and morbidity in long-term care, and are significantly more common in those receiving psychoactive medications.

A multifactorial approach is required, which should include the use of non-drug approaches to mitigate symptoms of BPSD, time and education for clinicians to review prescribing practices and the development of multidisciplinary teams for prescribing and polypharmacy reviews which include clinical pharmacists. This collaborative approach will need investment and support of policy-makers, but ultimately facilitates challenging decision-making that can improve patient care.

## Key Points

- Falls in nursing home residents are common, with a variety of non-modifiable and modifiable risk factors identified.
- Psychoactive prescribing is common in nursing home residents, with a variety of side effects including increased all-cause mortality, hip fractures, cardiovascular events and hospitalizations.
- Although psychoactive prescribing has a role in appropriately selected patients, the risk of harm must be considered.
- A multifactorial approach is required to address this clinical challenge, which should include the use of non-drug approaches to mitigate symptoms of BPSD, time and education for clinicians to review prescribing practices and the development of multidisciplinary teams which include clinical pharmacists.

*Conflict of interest:* The author has completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare that the study received no external funding, and the authors have no financial conflicts of interest to report.

*Declaration of original publication:* This manuscript contains original unpublished work and is not being submitted for publication elsewhere.

*Author contributions:* The author meets the requirements to be named as authors by the journal. The author meets all of the following criteria: (i) substantial contribution to conception and design, acquisition of data, or analysis and interpretation of data; (ii) drafting the article or revising it critically for important intellectual content; and (iii) final approval of the version to be published.

*Ethics approval and consent to participate:* Not applicable.

*Consent for publication:* All authors are aware of the submission, and consent for the submission to be appraised by the journal.

*Availability of data and material:* Not applicable.

*Funding:* The author is completing the work as part of a National Education Scotland funded fellowship.

*Acknowledgements:* Not applicable.

*Open Access:* This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, duplication, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

## References

1. Rubenstein LZ. Falls in older people: epidemiology, risk factors and strategies for prevention. *Age Ageing*. 2006;35:37–41. DOI: <https://doi.org/10.1093/ageing/af084>
2. Tideiksaar R. Falling in old age (prevention and management) 2. New York: Springer; 1997.
3. Ang SGM, O'Brien AP, Wilson A. Understanding carers' fall concern and their management of fall risk among older people at home. *BMC Geriatr*. 2019 ;19(1):144. DOI: <https://doi.org/10.1186/s12877-019-1162-7>
4. Rapp K, Becker C, Cameron ID, König HH, Büchele G. Epidemiology of falls in residential aged care: analysis of more than 70,000 falls from residents of bavarian nursing homes. *J Am Med Dir Assoc*. 2012;13(2):187.e1-6. DOI: <https://doi.org/10.1016/j.jamda.2011.06.011>
5. Vaishya R, Vaish A. Falls in Older Adults are Serious. *Indian J Orthop*. 2020;54(1):69-74. DOI: <https://doi.org/10.1007/s43465-019-00037-x>
6. Gama ZA, Gómez-Conesa A. Risk factors for falls in the elderly: systematic review. *Rev Saude Publica*. 2008 Oct;42(5):946-56. DOI: <https://doi.org/10.1590/s0034-89102008000500022>
7. Cox CA, van Jaarsveld HJ, Houterman S, et al. Psychotropic Drug Prescription and the Risk of Falls in Nursing Home Residents. *J Am Med Dir Assoc*. 2016 ;17(12):1089-1093. DOI: <https://doi.org/10.1016/j.jamda.2016.07.004az>
8. Guthrie B, McCowan C, Davey P, Simpson CR, Dreischulte T, Barnett K. High risk prescribing in primary care patients particularly vulnerable to adverse drug events: cross sectional population database analysis in Scottish general practice. *BMJ*. 2011. 342:d3514. DOI: <https://doi.org/10.1136/bmj.d3514>
9. Janus SI, van Manen JG, IJzerman MJ, Zuidema SU. Psychotropic drug prescriptions in Western European nursing homes. *Int Psychogeriatr*. 2016. 28(11):1775-1790. DOI: <https://doi.org/10.1017/S1041610216001150>
10. Selbæk G, Engedal K, Bergh S. The prevalence and course of neuropsychiatric symptoms in nursing home patients with dementia: a systematic review. *J Am Med Dir Assoc*. 2013;14:161–9. DOI: <https://doi.org/10.1016/j.jamda.2012.09.027>
11. Kwon CY, Lee B. Prevalence of Behavioral and Psychological Symptoms of Dementia in Community-Dwelling Dementia Patients: A Systematic Review. *Front Psychiatry*. 2021;12:741059. DOI: <https://doi.org/10.3389/fpsyg.2021.741059>
12. Makimoto K, Kang Y, Kobayashi S et al. Prevalence of behavioural and psychological symptoms of dementia in cognitively impaired elderly residents of long-term care facilities in East Asia: a cross sectional study. *Psychogeriatrics*. 2019;19(2):171-180. DOI: <https://doi.org/10.1111/psyg.12380>
13. Groot Kormelinck, C.M., van Teunenbroek, C.F., Kollen, B.J. et al. Reducing inappropriate psychotropic drug use in nursing home residents with dementia: protocol for participatory action research in a stepped-wedge cluster randomized trial. *BMC Psychiatry*. 2019. 19, 298. DOI: <https://doi.org/10.1186/s12888-019-2291-4>
14. Cousins JM, Bereznicki LR, Cooling NB, Peterson GM. Prescribing of psychotropic medication for nursing home residents with dementia: a general practitioner survey. *Clin Interv Aging*. 2017;12:1573-1578. DOI: <https://doi.org/10.2147/CIA.S146613>
15. Cohen-Mansfield J, Thein K & Dakheel-Ali M. What are the barriers to performing nonpharmacological interventions for Behavioral symptoms in the nursing home? *J Am Med Dir Assoc*. 2012. 13(4): 400–405. DOI: <https://doi.org/10.1016/j.jamda.2011.07.006>
16. van der Spek K, Gerritsen DL, Smalbrugge M, et al. Only 10% of the psychotropic drug use for neuropsychiatric symptoms in patients with dementia is fully appropriate. The PROPER I-study. *Int psychogeriatrics*. 2016;28:1589–95. DOI: <https://doi.org/10.1017/S104161021600082X>
17. McShane R, Keene J, Gedling K, Fairburn C, Jacoby R, Hope T. Do neuroleptic

- drugs hasten cognitive decline in dementia? Prospective study with necropsy follow up. *BMJ*. 1997; 314:266-70. DOI: <https://doi.org/10.1136/bmj.314.7076.266>
18. Gaugler JE, Duval S, Anderson KA, Kane RL. Predicting nursing home admission in the US: A Meta-Analysis. *BMC Geriatr*. 2007;7:13 DOI: <https://doi.org/10.1186/1471-2318-7-13>
  19. Chiu Y, Bero L, Hessel NA, Lexchin J, Harrington C. A literature review of clinical outcomes associated with antipsychotic medication use in North American nursing home residents. *Health Policy*. 2015. 119(6):802-13. DOI: <https://doi.org/10.1016/j.healthpol.2015.02.014>
  20. French DD, Campbell R, Spehar A et al. Drugs and falls in community-dwelling older people: A national veterans study. *Clin Ther* 2006;28:619-630. DOI: <https://doi.org/10.1016/j.clinthera.2006.04.011>
  21. Olazaran J, Valle D, Serra JA, Cano P & Muniz R. Psychotropic Medications and Falls in Nursing Homes: A Cross-Sectional Study. *J Am Med Dir Assoc*. 2013. 14:213-17 DOI: <https://doi.org/10.1016/j.jamda.2012.10.020>
  22. Janus SIM, Reinders GH, van Manen JG, Zuidema SU, IJzerman MJ. Psychotropic Drug-Related Fall Incidents in Nursing Home Residents Living in the Eastern Part of The Netherlands. *Drugs R D*. 2017;17(2):321-328. DOI: <https://doi.org/10.1007/s40268-017-0181-0>
  23. Landi F, Onder G, Cesari M, Barillaro C, Russo A, Bernabei R; Silver Network Home Care Study Group. Psychotropic medications and risk for falls among community-dwelling frail older people: an observational study. *J Gerontol A Biol Sci Med Sci*. 2005;60(5):622-6. DOI: <https://doi.org/10.1093/geron/60.5.622>
  24. Caspar S, Davis ED, Douzief A, Scott DR. Nonpharmacological Management of Behavioral and Psychological Symptoms of Dementia: What Works, in What Circumstances, and Why?. *Innov Aging*. 2018;2(1):igy001. DOI: <https://doi.org/10.1093/geroni/igy001>
  25. Coon JT, Abbott R, Rogers M et al. Interventions to reduce inappropriate prescribing of antipsychotic medications in people with dementia resident in care homes: a systematic review. *J Am Med Dir Assoc*. 2014;15:706-718 DOI: <https://doi.org/10.1016/j.jamda.2014.06.012>
  26. Ravona-Springer R, Davidson M. Considerations in psychotropic treatments in dementia--can polypharmacy be avoided? *Int J Neuropsychopharmacol*. 2014. 17(7):1107-17. DOI: <https://doi.org/10.1017/S1461145713000412>
  27. Cornegé-Blokland E, Kleijer BC, Hertogh CM van MR. Reasons to prescribe antipsychotics for the behavioural symptoms of dementia: a survey in Dutch nursing homes among physicians, nurses, and family caregivers. *J Am Med Dir Assoc*. 2012;13:e1-6. DOI: <https://doi.org/10.1016/j.jamda.2010.10.004>
  28. Smeets C, Smalbrugge M, Zuidema S, Derksen E, de Vries E, van der Spek K, et al. Factors related to psychotropic drug prescription for neuropsychiatric symptoms in nursing home residents with dementia. *J Am Med Dir Assoc*. 2014;15:835-40. DOI: <https://doi.org/10.1016/j.jamda.2014.08.016>
  29. Bell K, Hartmann C, Baughman AW. A pharmacist-led pilot using a performance dashboard to improve psychotropic medication use in a skilled nursing facility. *BMJ Open Qual*. 2020 ;9(3):e000997. DOI: <https://doi.org/10.1136/bmjopen-2020-000997>
  30. Frankenthal D, Lerman Y, Kalendaryev E, et al. Intervention with the screening tool of older persons potentially inappropriate prescriptions/screening tool to alert doctors to right treatment criteria in elderly residents of a chronic geriatric facility: a randomized clinical trial. *J Am Geriatr Soc* 2014;62:1658-65. DOI: <https://doi.org/10.1111/jgs.12993>
  31. Monane M, Matthias DM, Nagle BA, et al. Improving prescribing patterns for the elderly through an online drug utilization review intervention: a system linking the physician, pharmacist, and computer. *JAMA* 1998;280:1249-52. DOI: <https://doi.org/10.1001/jama.280.14.1249>
  32. Johnell, K, Jonasdottir Bergman, G., Fastbom, J., Danielsson, B., Borg, N., and Salmi, P. Psychotropic drugs and the risk of fall injuries, hospitalisations and mortality among older adults. *Int J Geriatr Psychiatry*. 2017. 32: 414-420. DOI: <https://doi.org/10.1002/gps.4483>
  33. Hughes CM, Lapane KL. Pharmacy interventions on prescribing in nursing homes: from evidence to practice. *Ther Adv Drug Saf*.2011;2(3):103-112. DOI: <https://doi.org/10.1177/2042098611406167>
  34. Ailred DP, Kennedy M-C, Hughes C, et al. . Interventions to optimise prescribing for older people in care homes. *Cochrane Database Syst Rev* 2016;2:CD009095. DOI: <https://doi.org/10.1002/14651858.CD009095.pub3>

How to cite this article: L.D. Hughes. Exploring the Relationship between Falls in Long Term Care and Psychoactive Prescribing. *J Frailty Aging* 2022; <http://dx.doi.org/10.14283/jfa.2022.53>