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Falls: Current Strategies for the Enduring Challenge



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Learning Objectives

- Describe current trends in CHI falls claims.
- Identify 3 variables contributing to falls and their associated risk mitigation strategies.
- Review 2 fall prevention technologies and consider usefulness in your environment.

Success Story – Falls Collaborative

- 12 large, multisite CCRCs participated from 2019 – 2021
 - Quarterly webinars, PIPs, monthly fall rates
- Decrease in fall rates (from 2019 through June 2021)
 - 11% decrease in overall fall rates and 20% decrease in LTC fall rates
- Decrease in claims \$ paid
 - Annual average number of falls claims decreased by 8.4%
 - 2019 through 2020, saved an estimated \$643K on claims per year
- Facilitated evaluation of falls programs and implementation of appropriate intervention



Current Challenges to Preventing Falls for Healthcare Providers

— What we see

- Frequent fallers
- [Staff education and training](#)
- [Root Cause Analysis](#)
- Data collection, tracking, analysis
- [Setting realistic expectations](#)

— What we hear

- “This is the way we’ve always done it”
- “If everyone is a high falls risk then no one is”
- “We have too many other priorities”
- “We currently don’t have the [staffing levels](#) to support our falls program”

Current Evidence-based Research

- Outdated Interventions and Processes
 - Bed and chair alarms¹
 - Ineffective Assessments²
- Mobility devices increase risk for falls^{3, 4, 5}
 - When using or not using a recommended device
- Technology is helping but be wary of initial results^{6, 7, 8}
 - Low quality studies, controlled environments, non-older adult samples
- Focus on preventing injuries⁹
 - Bone health risks, exercise, environment
- Dementia specific research still lacking^{10, 11, 12}
 - Significant increase in risk for falls and number of risk factors
 - Non-pharmacological interventions are best
- Most research focuses on community-dwelling older adults

Maintain mobility,
independence, and
autonomy

+

Prevent falls

=

?

Exploring Technology to Prevent Falls¹³

— First, be ready to:

- Be cautious with the research
- Talk to actual users about the tech
- Determine staff needs and preferences
- Assess your readiness for technology
- Assess system needs for technology
- Have questions and concerns ready during demo
 - Ask about compliance concerns
 - Ask about data security

— Then, discuss implementation with your staff:

- Is it appropriate for patient/resident population?
- Is it manageable and easy to use?
- Is it efficient?
- Is it easy to clean and disinfect?
- Is it readily available?
- Is it compatible with other products or systems in use?
- Does it have appropriate security features?

Considerations for Fall Prevention Technology¹⁴

- Does it meet basic requirements of safety and efficacy?
- What configuration is most appropriate based on your facility's existing workflow and clinical needs?
- Do you need two-way audio and video connectivity, or is one-way communication sufficient?
- Do you want to send data from cameras to the patient's electronic medical record (EMR)?
- Do you want the system to interface with peripheral devices or systems?
- Have you made sure to consider all associated costs?

Current Fall Prevention Technology¹⁵

— Prescriptive analytics¹⁶

- Reviews a patient's EMR and identify specific fall risk factors
- [Qventus](#)

— Predictive analytics

- [Foresight¹⁷](#)
 - Sensor systems ("sitter")
 - No sensors in bathroom
 - Predictive (based on gait and speed) and detective
- VirtuSense ([VSTOne](#))
 - Continuous video monitoring
 - Virtual rounding (vitals, telemetry, telehealth)



— Video review system

- [SafelyYou¹⁸](#)
 - Falls detection only
 - Decrease time on ground
 - Immediate review of fall to determine cause and potential for head injury

— Bed-exit alarm system

- VirtuSense ([VSTAlert](#))
 - Bed and chair exits
 - Staff may have to adjust camera throughout the day



Medications and Fall Risk

- Opioids^{19, 20}
 - Increased risk of falls, fall injuries, and fractures
 - Within 2 weeks of filling opioid prescription were 2.4 times more likely to have a fall
- Polypharmacy
 - Increases the odds of adverse related hospital visits by 88%²¹
 - Fall-related fractures make up 10% - 25%
 - Independent factor for both increased fall risk and hospitalization^{22, 23}
 - More medications = higher their fall risk²⁴
 - ≥4 medications increases fall risk by 18%
 - ≥5 medications by 21%
 - 10 or more medications increases fall risk by 50%

- Anesthesia^{25, 26}
 - Not directly associated to falls
 - Peripheral nerve blocks not associated with increased risk for falls
- Surgery^{27, 28}
 - Periop fall risk associated with age, frailty
 - Postop period risk for falls based on preop medical status, surgery type, hospitalization, pain meds



Preventing Medication-related Falls

- Common medication errors related to falls²⁹
 - Failure to anticipate inherent risks for medications
 - Inadequate proactive clinical assessments
 - Communication gaps
 - [Medication Reconciliation](#)
 - Failure of medication-use processes
- Medication Reviews³⁰
 - Prevents fall-related injuries and fractures
 - LTC – Med Directors & Pharmacists
 - [Pharmacist Fall Risk Assessment](#)

Facilitators to Improving Medication Review Processes³¹

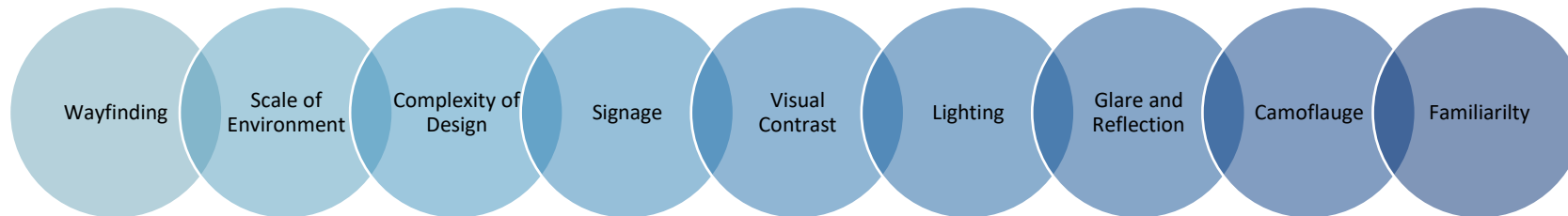
- Ability to prioritize medications through resident collaboration
- Use of screening tools/decision aids
- Unfamiliarity with the actual resident, leading to unbiased decisions
- Education through multidisciplinary team collaboration
- Full medical chart for pharmacist review

Barriers to Improving Medication Review Processes³¹

- Lack of collaboration with residents who have cognitive deficits
- Unfamiliarity with screening tools and/or decision aids
- Unfamiliarity with the actual resident, leading to dependence on clinical literature
- Multidisciplinary team lack of understanding of each other's roles
- Physicians limiting the roles of nurses and pharmacists
- Postponed new medication orders
- Lack of time for nurses to participate in medication reviews
- Difficulty educating resident on medication changes or difficulty reaching a resident representative

Dementia-related Falls

- Non-pharmacological interventions need to be first line intervention to reduce behavioral & psychological symptoms in dementia (BPSD)
 - Exercise
 - Long term exercise (≥ 1 year) can decrease risk of falls and decrease risk of injurious falls³²
 - Sleep
 - Predicts mental well-being, ability to perform ADLs, fall risk, risk of hospitalization³³
 - Lowest risk of falls 7-8 hours of sleep per day³⁴
 - Therapeutic Activities
 - Reduce BPSD through activity kits, sensory stimulation, recreational activities³⁵
 - Environment³⁶
 - Greater declines in vision and hearing, visual-spatial orientation, and misperceptions of visual images (shadows)



Mitigating Risk of Falls and Risk of Claims

— What is working

- Huddles
- Purposeful Rounding
- Staff education and training
- Falls Leader
- Internal benchmarking

— What we also recommend

- [Setting realistic expectations](#)
- Patient/resident education
- [Disclosure](#)
- [Culture of safety](#)



Recommendations to Endure the Challenge

- Evaluate fall risk assessment for appropriateness
- Focus on internal benchmarks
- Take the time to assess your needs for technology and discuss with staff
- Evaluate medication review processes for effectiveness
- Strive for person-centered interventions for dementia residents
- Collaborate with other providers
- Rely on your Therapy staff for fall prevention strategies, interventions, education, etc.



References

1. LeLaurin JH, Shorr RI. Preventing Falls in Hospitalized Patients: State of the Science. *Clin Geriatr Med*. 2019;35(2):273-283. doi:10.1016/j.cger.2019.01.007
2. Matarese M, Ivziku D, Bartolozzi F, Piredda M, De Marinis MG. Systematic review of fall risk screening tools for older patients in acute hospitals. *J Adv Nurs*. 2015;71(6):1198-1209. doi:10.1111/jan.12542
3. Thies, S.B., Bates, A., Costamagna, E. et al. Are older people putting themselves at risk when using their walking frames?. *BMC Geriatr* 20, 90 (2020). <https://doi.org/10.1186/s12877-020-1450-2>
4. Clare Luz, PhD, Tamara Bush, PhD, Xiaoxi Shen, MS, Do Canes or Walkers Make Any Difference? NonUse and Fall Injuries, *The Gerontologist*, Volume 57, Issue 2, 1 April 2017, Pages 211–218, <https://doi.org/10.1093/geront/gnv096>
5. Muir-Hunter SW, Montero-Odasso M. The attentional demands of ambulating with an assistive device in older adults with Alzheimer's disease. *Gait Posture*. 2017;54:202-208. doi:10.1016/j.gaitpost.2017.03.011
6. Lapiere N, Neubauer N, Miguel-Cruz A, Rios Rincon A, Liu L, Rousseau J. The state of knowledge on technologies and their use for fall detection: A scoping review [published correction appears in *Int J Med Inform*. 2018 Aug;116:9]. *Int J Med Inform*. 2018;111:58-71. doi:10.1016/j.ijmedinf.2017.12.015
7. Huter K, Krick T, Domhoff D, Seibert K, Wolf-Ostermann K, Rothgang H. Effectiveness of Digital Technologies to Support Nursing Care: Results of a Scoping Review. *J Multidiscip Healthc*. 2020;13:1905-1926. Published 2020 Dec 9. doi:10.2147/JMDH.S286193
8. Cooper K, Pavlova A, Greig L, et al. Health technologies for the prevention and detection of falls in adult hospital inpatients: a scoping review. *JBI Evid Synth*. 2021;19(10):2478-2658. Published 2021 Jun 18. doi:10.11124/JBIES-20-00114
9. Bischoff-Ferrari HA, Bhasin S, Manson JE. Preventing Fractures and Falls: A Limited Role for Calcium and Vitamin D Supplements? *JAMA*. 2018;319(15):1552-1553. doi:10.1001/jama.2018.4023
10. Fillit H, Aigbogun MS, Gagnon-Sanschagrin P, et al. Impact of agitation in long-term care residents with dementia in the United States. *International Journal of Geriatric Psychiatry*. 2021;36(12):1959-1969. doi:10.1002/gps.5604
11. Fernando E, Fraser M, Hendriksen J, Kim CH, Muir-Hunter SW. Risk Factors Associated with Falls in Older Adults with Dementia: A Systematic Review. *Physiother Can*. 2017;69(2):161-170. doi:10.3138/ptc.2016-14
12. Burgon C, Darby J, Pollock K, et al. Perspectives of healthcare professionals in England on falls interventions for people with dementia: a qualitative interview study. *BMJ Open*. 2019;9(2):e025702. Published 2019 Feb 11. doi:10.1136/bmjopen-2018-025702
13. ECRI. Falls Toolkit, 2021 Dec [cited 2022 Jan 7]. <https://www.ecri.org/EmailResources/PSRQ/CaringComm/Falls%20Toolkit%20Revision%202021-%20FINAL%2012-3.pdf>
14. ECRI. Key Considerations for Selecting a Tele-Sitting System. 2020 Nov [cited 2022, Jan 7]. <https://www.ecri.org/components/HDJournal/Pages/Key-Considerations-for-Selecting-a-Tele-sitting-System.aspx>
15. Oh-Park, Mooyeon MD; Doan, Thao MD; Dohle, Carolin MD; Vermiglio-Kohn, Valerie RN, MSN, CRRN; Abdou, Andrew DO Technology Utilization in Fall Prevention, *American Journal of Physical Medicine & Rehabilitation*: January 2021 - Volume 100 - Issue 1 - p 92-99 doi: 10.1097/PHM.0000000000001554
16. Bertsimas D, Li ML, Paschalidis ICh, Wang T. Prescriptive analytics for reducing 30-day hospital readmissions after general surgery. Yeh CC, ed. *PLOS ONE*. 2020;15(9):e0238118. doi:10.1371/journal.pone.0238118
17. Potter P, Allen K, Constantinou E, et al. Evaluation of Sensor Technology to Detect Fall Risk and Prevent Falls in Acute Care. *The Joint Commission Journal on Quality and Patient Safety*. 2017;43(8):414-421. doi:10.1016/j.jcjq.2017.05.003
18. Bayen E, Nickels S, Xiong G, Jacquemot J, Subramaniam R, Agrawal P, Hemraj R, Bayen A, Miller BL, Netscher G Reduction of Time on the Ground Related to Real-Time Video Detection of Falls in Memory Care Facilities: Observational Study *J Med Internet Res* 2021;23(6):e17551 doi: 10.2196/17551
19. Daoust R, Paquet J, Moore L, et al. Recent opioid use and fall-related injury among older patients with trauma. *CMAJ*. 2018;190(16):E500-E506. doi:10.1503/cmaj.171286
20. Aya Yoshikawa, DrPH, PhD, Gilbert Ramirez, DrPH, MPH, Matthew Lee Smith, PhD, MPH, CHES, Margaret Foster, MS, MPH, AHIP, Anas K Nabil, MBBS, MPH, Sagar N Jani, MBBS, Marcia G Ory, PhD, MPH, Opioid Use and the Risk of Falls, Fall Injuries and Fractures among Older Adults: A Systematic Review and Meta-Analysis, *The Journals of Gerontology: Series A*, Volume 75, Issue 10, October 2020, Pages 1989–1995, <https://doi.org/10.1093/gerona/glaa038>
21. Bourgeois FT, Shannon MW, Valim C, Mandl KD. Adverse drug events in the outpatient setting: an 11-year national analysis
22. Bor, A., Matuz, M., Csatorjai, M. et al. Medication use and risk of falls among nursing home residents: a retrospective cohort study. *Int J Clin Pharm* 39, 408–415 (2017). <https://doi.org/10.1007/s11096-017-0426-6>
23. Hoel RW, Giddings Connolly RM, Takahashi PY. Polypharmacy Management in Older Patients. *Mayo Clinic Proceedings*. 2021;96(1):242-256. doi:10.1016/j.mayocp.2020.06.012
24. Dhalwani NN, Fahami R, Sathanapally H, et al. Association between polypharmacy and falls in older adults: a longitudinal study from England *BMJ Open* 2017;7:e016358. doi: 10.1136/bmjopen-2017-016358
25. Eduardo PC, Aniza Surinam GL, Giselle Andrea UC, et al. Lumbar-Sacral Plexus Block Anesthesia versus General Anesthesia for Total Hip Arthroplasty: Case Control Study. *Open Journal of Anesthesiology*. 2021;11(09):259-268. doi:10.4236/ojanes.2021.119025
26. Turbitt LR, McHardy PG, Casanova M, Shapiro J, Li L, Choi S. Analysis of Inpatient Falls After Total Knee Arthroplasty in Patients With Continuous Femoral Nerve Block. *Anesthesia & Analgesia*. 2018;127(1):224-227. doi:10.1213/ane.0000000000002703
27. Fortes Vitor A, Alves Moura L, Nunes De Lima Fernandes A, Rocha Botarelli F, Naiara De Medeiros Araújo J, Caroline Da Costa Vitorino I. *RISK for FALLS in PATIENTS in the POSTOPERATIVE PERIOD*. <https://docs.bvsalud.org/biblioref/2016/07/594/38509-151063-1-pb.pdf>
28. Kronzer VL, Wildes TM, Stark SL, Avidan MS. Review of perioperative falls. *Br J Anaesth*. 2016;117(6):720-732. doi:10.1093/bja/aew377
29. Ming Y, Zecevic AA, Hunter SW, Miao W, Tirona RG. Medication Review in Preventing Older Adults' Fall-Related Injury: a Systematic Review & Meta-Analysis. *Can Geriatr J*. 2021;24(3):237-250. Published 2021 Sep 1. doi:10.5770/cgj.24.478
30. Institute for Safe Medication Practices Canada (ISMP Canada). Medication incidents that increase the risk of falls: a multi-incident analysis. *Safety Bulletin* 2015 Dec;15(12). https://www.ismp-canada.org/download/safetyBulletins/2015/ISMPCSB2015-12_Falls.pdf
31. Wouters H, Foster JM, Ensink A, O'Donnell LK, Zuidema SU, Boersma F, Taxis K. Barriers and facilitators of conducting medication reviews in nursing home residents: a qualitative study. *Front Pharm*
32. de Souto Barreto P, Rolland Y, Vellas B, Maltais M. Association of Long-term Exercise Training With Risk of Falls, Fractures, Hospitalizations, and Mortality in Older Adults: A Systematic Review and Meta-analysis. *JAMA Intern Med*. 2019;179(3):394-405. doi:10.1001/jamainternmed.2018.5406
33. Dzierzewski JM, Dautovich ND. Who Cares about Sleep in Older Adults?. *Clin Gerontol*. 2018;41(2):109-112. doi:10.1080/07317115.2017.1421870
34. Wu L, Sun D. Sleep duration and falls: a systemic review and meta-analysis of observational studies. *Journal of Sleep Research*. 2017;26(3):293-301. doi:10.1111/jsr.12505
35. de Oliveira AM, Radanovic M, de Mello PC, et al. Nonpharmacological Interventions to Reduce Behavioral and Psychological Symptoms of Dementia: A Systematic Review. *Biomed Res Int*. 2015;2015:218980. doi:10.1155/2015/218980
36. Orfield SJ. Dementia Environment Design in Seniors Housing: Optimizing Resident Perception and Cognition. *Seniors Housing & Care Journal*. 2015;53:58-69.

Questions

