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What interventions prevent falls in long-term care? The case of Saint-Louis Residence

A Bruyère Rapid Review

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Contents

Key messages

- Evidence from available long-term care Minimum Data Set (MDS) data and staff perception show that cognitive impairment and mobility status are common risk factors for falls at Saint-Louis Residence that could be considered in falls prevention strategies.

- Factors contributing to the high rates of falls included client and environmental factors such as cognitive impairment, lack of safety inspection of ambulatory devices, as well as organization of care factors, e.g., limited occupational therapy.

- Falls prevention interventions including falls risk assessment on admission and after a fall, multifactorial interventions, client and staff education as well as strength and balance training have been recommended in previous guidelines.

Executive summary

Falls are a major public health problem among seniors. Health Quality Ontario (HQO) set benchmarks for quality indicators to enable comparison of performance between long-term care (LTC) facilities and encourage quality improvement. The quality indicator used to monitor falls in LTC is the percentage of residents who fell in the last 30 days. The rate of falls at Saint-Louis Residence (SLR) is higher than the HQO benchmark of nine per cent.

To investigate the reasons for the high rate of falls at SLR, we examined available data, conducted staff interviews as well as an evidence review on risk factors for falls and the effectiveness of falls prevention interventions in LTC.

Available data and staff perceptions showed that the top two risk factors present at SLR where actions could be taken are cognitive impairment and mobility status. Most of the falls occurred during the day and evening shifts when residents are awake and active. Factors contributing to the high rates of falls included client and environmental factors such as cognitive impairment, lack of safety inspection of ambulatory devices, as well as organization of care factors, e.g., limited occupational therapy.

Falls prevention interventions including falls risk assessment on admission and after a fall, multifactorial interventions, client and staff education, as well as strength and balance training have been recommended in previous guidelines. The preventive interventions where data from SLR identifies actionable gaps are multifactorial interventions tailored to client and family needs, as well as strength and balance training.

Based on the evidence, we recommend the following strategies to reduce falls rates at SLR:

1. Improve data for monitoring impact of changes.
2. Prioritize interventions based on data and needs; including client and staff education, falls risk assessment and multifactorial interventions along with continuing existing good practices such as vitamin D and medication review.
3. Communication between SLR and Élisabeth Bruyère Residence (EBR), as well as within SLR across different disciplines.
4. Human resources alignment with peak periods, e.g., increased use of volunteers during peak periods.

Context of falls at Saint-Louis

SLR is one of Bruyère's LTC facilities with 198 beds in seven units including four LTC units, a convalescent care unit and two units with special services for patients with dementia. It has three levels of staff with a staffing ratio of one staff to ten patients.

Resident characteristics

SLR has a sicker and frailer population than the average LTC population of Ontario, with 53 per cent meeting the Cognitive Performance Scale (CPS) criteria of severe impairment compared to the average LTC Ontario population where only 28 per cent meet this level. There is also a larger proportion of women (82 per cent) vs. 62 per cent in the average Ontario LTC residence.

Falls data

Falls at SLR are 8.2 per cent above the HQO benchmark of nine per cent, with a percentage of residents who fell in the last 30 days of 17.2 per cent. There may be a higher proportion of falls in the dementia units (19 per cent vs. nine per cent) according to data collected from September 2013 to March 2014. These proportions may be misleading because they are based on proportion of beds available and all beds may not be occupied.

According to the Bruyère Risk Incident Management System (RIMS) data, 300 unique incident falls were reported at SLR from January 1 to September 25, 2014. Of these, 21 per cent were witnessed; 57 per cent were found on the floor. Of the 300 falls, 45 per cent were attributed to loss of balance. The three most common positions from which people fell were standing position (22 per cent), chair (21 per cent), and wheelchair (19 per cent). Injuries were reported for 17 per cent of the falls (51 falls), with five per cent of these injuries in the head and neck region, and 0.7 per cent assessed as serious.

Most of the falls occurred in the day shift (44.3 per cent) and evening shift (41.3 per cent) when residents are awake and active; only 14.3 per cent at night. When plotted according to time, there are peaks in falls at 7 a.m., 10 a.m., 3:30 p.m. and 7 p.m.

PROTECTIVE MEASURES AND RISK FACTORS

In almost half of incident falls, all protective measures in the care plan were in place (43 per cent). Protective measures in the care plan most commonly identified as being in place for the fall incidents were call bells (46 per cent of incident falls), low bed (32 per cent of incidents), constant care (15 per cent of incidents), and ambulation device (ten per cent of incidents).

Of the 171 incidents where some protective measures were identified as missing, the most common missing protective measures were: low bed (16 per cent), constant care (ten per cent), alarm (ten per cent) and ambulation device (five per cent).

At the time of incident falls, the top five risk factors identified on the RIMS report for these 300 falls were cognitive impairment (60 per cent), mobility status (46 per cent), difficulty following instructions (37 per cent), change in cognitive status (18 per cent) and increased frequency of falling (16 per cent).

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Staff perceptions on falls at SLR

A focus group discussion with the SRL staff identified the following observations:

CLIENT FACTORS

- Staff perceives all residents to be at high risk of falling.
- Dementia patients push each other.
- Residents are impatient bringing them to take risks that lead to falls.

ENVIRONMENTAL FACTORS

- Low mattresses on the floor can be a tripping hazard.
- Wheelchairs and other equipment may not be used properly (e.g., unfixed safety belts), not regularly inspected for safety or may be absent for cleaning at times.
- Most falls occur at dawn or evening.

ORGANIZATION OF CARE

- Staff feels stressed at mealtimes because of the short time to feed many residents.
- Communication within SLR about residents could be improved (e.g., housekeeping staff may not be aware of changes in a resident's cognitive status).
- Occupational therapy limited in availability.
- Communication across Bruyère Continuing Care and how SLR is included because of its distance.

Evidence review

We searched for relevant systematic reviews and guidelines published between January 2007 and November 2014 in Trip Database. Trip Database is an online database with links to resources for evidence-based medicine (EBM) including clinical guidelines and systematic reviews. Content is updated every two weeks from PubMed using a validated search. In addition, we examined reference lists of relevant articles and consulted experts at the Bruyère Research Institute. The search results and potentially eligible articles were screened and reviewed by two authors. The quality of eligible guidelines and systematic reviews were assessed using the Appraisal of Guidelines, Research and Evaluation (AGREE) score and the Assessing the Methodological Quality of Systematic Reviews (AMSTAR) checklist respectively.

We included clinical guidelines and systematic reviews if they considered interventions to prevent falls or injuries from falls in older adults (aged 65 or more) in LTC facilities such as residential care or nursing homes, compared to usual care or other interventions. The interventions could be aimed at the staff, clients, physicians or changes to the setting such as environmental modification. We excluded guidelines and systematic reviews on interventions in community-dwelling and hospitalized populations. We also excluded those on post-fall interventions only.

Evidence review: Risk factors for falls

Based on a 2013 updated assessment of risk by the American College of Physicians, the most important predictors of risk of falling for LTC residents are the use of restraints (ten times higher risk), history of a previous fall (three times higher risk), systolic hypotension (two times higher risk, the presence of polypharmacy or benzodiazepines (two to seven times higher risk) and cognitive impairment (1.8 times higher risk).

Evidence review: Systematic reviews of falls prevention

We identified three systematic reviews (1-3) and five guidelines (4-8) with evidence focused on the long-term care setting. A 2012 Cochrane review of high quality (AMSTAR score: 11/11) assessed interventions for preventing falls in older people in care facilities (1). The mean age of the participants was 84 years (77 per cent women) and some studies specifically recruited participants with cognitive impairment.

Summarizing the evidence, most interventions were conducted in an older population (mean age: 80 years). Cognitive status was not well reported, but some trials did include residents with dementia. Most results suffered from low-quality evidence (due to study limitations and imprecise estimates) from a limited number of randomized controlled trials. The interventions which were shown to prevent five or more falls per 100 people per year were:

- Client education on personal risk factors and risk reduction strategies (in younger adults, mean age: 70).
- Staff education on patient safety (including falls, urinary tract infection and pressure ulcers).
- Strength and balance training.
- Medication review of all medications.
- Multifactorial program of low-intensity exercise, fluid for dehydration and management of urinary incontinence.
- Wireless position monitoring vs. usual care.
- Vitamin D supplementation.
- Staff education on patient safety (including falls, urinary tract infection and pressure ulcers).

Interventions with evidence of benefit of less than five falls per year were: multifactorial interventions, fall risk assessment, pharmacist outreach program, brisk walking). Carpet floors (when compared to vinyl) increased fall rates in a subacute hospital.

Evidence review: Clinical guidelines for fall prevention

We included clinical guidelines from Canada (Registered Nurses Association of Ontario-RNAO 2011)(9), UK (NICE guidelines, 2013)(5), Australia (Australian RACF guidelines, 2009)(6), the USA (AGS/BGS guidelines 2010)(7). We also assessed the ACOVE3 statement on preventing falls in vulnerable elderly (2007)(8).

INTERVENTIONS RECOMMENDED BASED ON HIGH QUALITY EVIDENCE

- Assessment of fall risk using multiple factors (e.g., cognition, mobility, vision, medication) on admission and/or after a fall.
- Multifactorial interventions to prevent falls, tailored to the local context and client's risk factors.
- Strength and balance evaluation and training.
- Home safety interventions in people with a history of falls.
- Psychotropic medication review and withdrawal.

INTERVENTIONS RECOMMENDED, DEPENDING ON SETTING

- Client education which may not be accepted by some clients.
- Staff education in falls risk and prevention.

INTERVENTIONS WITH INSUFFICIENT EVIDENCE

- Low intensity exercise and incontinence programs.
- Hip protectors.

INTERVENTIONS NOT RECOMMENDED

- Untargeted group exercise.
- Brisk walking.

Synthesis of fall data, evidence review and staff perceptions

From the above evidence and findings, the top two risk factors present at SLR from falls data and staff perceptions where actions could be taken are cognitive impairment and mobility status. Preventive interventions including falls risk assessment on admission and post-fall, multifactorial interventions, client and staff education, strength and balance training have been recommended in previous guidelines.

The preventive interventions where data from SLR identifies actionable gaps are multifactorial interventions tailored to client and family needs and strength and balance training.

Gap analysis at Saint-Louis

A recent gap analysis by the RNAO falls prevention coordinator in 2011 showed that the SLR practice met or partially met all the RNAO Best Practice Guideline Recommendations for prevention of falls and falls injuries.

Several areas of good practice were already in place in accordance with the RNAO 2011 guidelines on falls prevention:

1. Medication review.
2. Use of hip protectors.
3. Vitamin D supplementation.
4. Nursing education: yearly education about falls prevention.
5. Policy for least restraint
6. Policy for organizational support
7. Policy for medication review

Action areas identified were:

1. Improved fall risk assessment on admission (e.g., validated tool, defining falls, completing RAPS, assessing vision, hearing).
2. Assessing fall risk after fall (e.g., neurological assessment after unwitnessed falls).
3. Explicit documentation of falls, falls risk, falls prevention measures in charts.
4. Add client education for those at high risk.
5. Formalize environmental assessments.
6. Existing exercise programming could be increased.

Discussion of evidence review:

The following four interventions were effective at reducing falls, based on systematic reviews and clinical practice guidelines: 1) Multifactorial falls risk assessment and risk reduction; 2) Multifactorial interventions; 3) Strength and balance training; 4) Psychotropic medication review and discontinuation (if appropriate).

One limitation of these recommendations is that there is uncertainty about the components of multifactorial assessment or interventions. For example, multifactorial risk assessment could include identification of falls history; assessment of gait, balance and mobility, and muscle weakness; assessment of osteoporosis risk; assessment of the older person's perceived functional ability and fear relating to falling; assessment of visual impairment; assessment of cognitive impairment and neurological examination; assessment of urinary incontinence; assessment of environmental hazards; cardiovascular examination and medication review.

Client education and staff education about falls risk and falls risk reduction were not uniformly recommended by clinical guidelines and may depend on the setting, and the quality of evidence is limited by a small number of small studies.

Regarding vitamin D, although there is evidence of benefit from randomized trials, there is controversy as to what dose of vitamin D should be given to prevent falls in older people, and none of the guidelines recommend vitamin D uniformly. However, there is evidence that the administration of 800 UI of vitamin D in older people with risk of vitamin D insufficiency or deficiency reduces the risk of falls and fractures. The RNAO guidelines recommend vitamin D supplementation for residents since they have a risk for vitamin D insufficiency or deficiency because the production of vitamin D in the skin falls to near zero for four to five months of the year in Canada.

Inferences and next steps

Based on our review of the data from SLR and the evidence review, we propose the following recommendations.

1. **Data structure**
   Bruyère Continuing Care should consider developing methods of analyzing RIMS data on falls incidents and make them available for continuous monitoring of falls prevention strategies. These methods should be able to generate a report of the number of falls, incidence of repeat fallers, associated risk factors and protective measures associated with each incident.

2. **Falls risk assessment**
   Staff should consider implementing falls risk assessment tools on admission, after a fall and when there is a change in cognitive status to detect fall-prone individuals and to identify their risk factors. They can then concentrate their efforts on fall-prone clients and implement strategies or interventions to reduce the occurrence of future falls.

3. **Staff education**
   Bruyère Continuing Care should continue its annual staff education program about falls risk, and consider including updated RIMS data in these annual sessions on protective measures in place and missing as well as resident risk factors to learn from experience. The staff should be encouraged to implement interventions that are compatible with the client's values, needs, wishes, preferences and risk factors.

4. **Client education**
   Client education is not currently done at SLR; is in line with the move towards patient-centred care, and could be implemented with clients at high risk of falling to share risk information with the clients and their family, discuss risk reduction strategies that the resident can take to prevent falls. Staff should engage the family as well in supporting client activity and assisting in falls prevention strategies.

5. **Communication**
   Based on staff consultation, there is a perception of a need for improved communication within SLR as well as between SLR and EBH. At SLR, communication between different health and service providers could assist in identifying people at high risk of falling and mitigating this risk. Communication across Bruyère Continuing Care (for example between SLR and EBR) could motivate staff to share experiences and strategies for improvement.

6. **Equipment safety checks**
   Based on the staff consultation, there appears to be a need to review that protective measures are in place, used appropriately and in good condition (e.g., wheelchairs and sofa chairs).

7. **Volunteer services**
   Consider how volunteer services could be incorporated at peak hours (e.g., meal time and shift change) when residents are at a greater risk of falling. Also, staff could be deployed differently to cover periods of peak activity such as meal times and also shift change.

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