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SUMMARY WITH CRITICAL APPRAISAL

Fall Prevention Guidelines for Patients in Wheelchairs or Patients with Delirium: A Review of Evidence-Based Guidelines

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Abbreviations

WRHA

Winnipeg Regional Health Authority

Context and Policy Issues

In general, falls are defined as sudden unintentional changes in position resulting in an individual landing on a lower level.¹ Falls incur two billion dollars per year of direct health care costs in Canada and cause 95% of hip fractures. Falls resulting in injuries increased 43% between 2003 and 2008 while falls resulting in death increased 65% over the same period. Falls are the leading cause of injury among seniors with 20 to 30% experiencing at least one fall per year, accounting for 85% of seniors' injury-related hospitalizations and over 30% of seniors' subsequent admissions to long-term care.^{2,3} Even falls that do not incur injury can result in future health care costs since they may lead seniors to limit their activities, leading to declines in health and function and increasing the risk of future falls with serious outcomes.^{3,4} Fall prevention may reduce injuries, long-term care admissions, hospitalizations, and overall health care costs; preventing 20% of falls could reduce 7,500 hospitalizations and save the Canadian health care system \$138 million per year.⁴

While in theory assistive devices such as wheelchairs promote independence, mobility, and fall prevention, they are not always properly used or maintained. Falls during transfer – defined as transferring one's body from one surface to another – may result from an improperly maintained wheelchair. For example, if a wheelchair's locking mechanism is not functioning properly or is not appropriately engaged, then the wheelchair becomes unsafe and can then lead to falls instead of preventing them.^{4,5} Installation of automatic or more robust wheel locks as well as use of a wheelchair maintenance schedule may reduce injurious falls.^{5,6} Improper transfer techniques (from wheelchair to and from bed or toilet) as well as unassisted transfers may also increase the risk of injurious falls.^{5,6} Nearly 60% of people using manual wheelchairs experience falls and face the challenges of independent or assisted recovery. Independent recovery relies on the patient maintaining contact with the wheelchair and having the physical capacity to recover on their own. If independent recovery is not possible, then the patient remains on the ground until assistance is available. If a patient remains on the ground for a prolonged period of time, it is predictive of future injurious falls and is also associated with declines in activities of daily living, increased hospital admissions, and increased long-term care admissions.⁵

Another consideration for fall risk is delirium. Delirium, also known as acute confusional state, has an acute onset, developing over one to two days and is a common clinical symptom characterized by fluctuating consciousness, cognitive function, attention, thinking, or perception.^{7,8} Patients presenting with delirium may be: restless, agitated, and aggressive; withdrawn, sleepy, and quiet; or a mixture of these characteristics.⁷ Delirium and subsequent confusion are risk factors for falls. Additionally, older patients are at risk of developing delirium after a hip fracture, which itself is a serious consequence of a fall.^{4,7,9} Patients with a hip fracture and delirium have increased hospital stays, falls, pressure sore development, and risk of death than those without delirium.^{7,9} Fall prevention for patients with delirium thus involves preventing delirium or identifying and managing the underlying causes of the delirium such as: orienting the patient to person, place, and time (who the people around them are, their location, what the time and date are); providing an environment with context and familiarity (e.g., a room with a window or clock filled with personal belongings or pictures); talking and providing explanations in a calm, reassuring voice; as well as reviewing and changing medications to limit those that may cause or worsen delirium.⁷⁻⁹

As Canada's population continues to age, falls and fall prevention will continue to be a growing public health issue. Effective fall prevention accounts for the combination of fall risk factors unique to each senior, tailoring the intervention to target the individual's specific health status, situation, and environment. Evidence-based fall-prevention guidelines can assist in assessment of individual patients' fall risks as well as establish standards to decrease the number and effect of falls.³

The objective of this report is to summarize the relevant evidence-based guidelines associated with the prevention of falls in patients requiring wheelchairs and patients with delirium in institutionalized care.

Research Questions

1. What are the evidence based guidelines to prevent falls for older adults requiring wheelchairs in institutionalized care?
2. What are the evidence based guidelines to prevent falls for adult patients with delirium in institutionalized care?

Key Findings

One evidence-based guideline was included in this review that addressed fall prevention in both patients in wheelchairs and patients with delirium.

For patients in wheelchairs, multifactorial fall prevention interventions that include individualized gait, balance and functional coordination exercises are recommended (level II evidence). In addition, it is recommended that fall prevention for patients in wheelchairs include: supervised exercise; assessment of a patient's ability to use their wheelchair (including transfers) and whether this mobility aid is appropriate for the patient; and ensuring the wheelchair is in good condition (clinical experience and expert consensus).

For patients with delirium, it is recommended that multifactorial fall prevention interventions address individual fall risk factors for patients in long-term care facilities (level I evidence) and in acute care facilities (level II evidence). Based on clinical experience and expert consensus, the guideline also recommends: treating delirium as well as the reversible causes of delirium, assessing the presence of delirium in older adults after a fall, modifying regular fall prevention interventions to suit the individual patient's situation, and avoiding the use of restraints unless all other options have been exhausted. Lastly, it is recommended that older adults with cognitive impairments be assessed for fall risk (expert opinion).

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including PubMed, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused Internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were fall prevention and either delirium or wheelchair users. Search filters were applied to limit retrieval to guidelines. Where possible, retrieval was limited to the human population. The search was

also limited to English language documents published between January 1, 2009 and June 19, 2019.

Selection Criteria and Methods

One reviewer screened citations and selected studies. In the first level of screening, titles and abstracts were reviewed and potentially relevant articles were retrieved and assessed for inclusion. The final selection of full-text articles was based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Question 1: Older patients (over 65 years of age) requiring wheelchairs in institutionalized care (e.g., care homes, hospital setting) Question 2: Adult patients with delirium in institutionalized care (e.g., care homes, hospital setting)
Intervention	Fall prevention strategies (e.g., using brakes or foot pedals on wheelchairs)
Comparator	Not applicable
Outcomes	Evidence-based guidelines
Study Designs	Evidence-based guidelines

Exclusion Criteria

Articles were excluded if they did not meet the selection criteria outlined in Table 1, were duplicate publications, were not published in English, or were published prior to 2009. Guidelines with unclear methodology were also excluded.

Critical Appraisal of Individual Studies

The included evidence-based guideline¹⁰ was assessed with the Appraisal of Guidelines for REsearch and Evaluation II (AGREE II) instrument.¹¹ Summary scores were not calculated for the included guidelines; rather, a review of the strengths and limitations of each included guideline were described narratively.

Summary of Evidence

Quantity of Research Available

A total of 244 citations were identified in the literature search. Following screening of titles and abstracts, 203 citations were excluded and 41 potentially relevant reports from the electronic search were retrieved for full-text review. One potentially relevant publication was retrieved from the grey literature search for full-text review. Of these potentially relevant articles, 41 publications were excluded for various reasons, and one evidence-based guideline met the inclusion criteria and was included in this report.¹⁰ Appendix 1 presents the PRISMA flowchart of the study selection. Additional references of potential interest are provided in Appendix 5.

Summary of Study Characteristics

Additional details regarding the characteristics of the included publication are provided in Appendix 2.

Study Design

One evidence-based guideline, by the Winnipeg Regional Health Authority (WRHA), was included in this review.¹⁰ The WRHA conducted a systematic review to identify published systematic reviews, meta-analyses, and clinical practice guidelines. Evidence quality was assessed using levels of evidence, ranging from “level I” (highest quality) to “no level stated” or “no level indicated” (lowest quality). “Level I” denotes evidence obtained from a systematic review of all relevant randomized controlled trials; “Level II” denotes evidence obtained from at least one properly designed randomized controlled trial; “no level stated” denotes evidence obtained from expert opinion; and “no level indicated” denotes areas without strong research evidence deemed important based on clinical experience or expert consensus. The methodology of recommendation development was unclear and ratings of the strength of recommendations were not provided. The guideline was validated through stakeholder feedback.¹⁰

Country of Origin

The WRHA guideline is meant to apply in Canada.¹⁰

Patient Population

The target population for the WRHA guideline is adults over the age of 65 or any adult at risk of falling, including patients in wheelchairs and patients with delirium. The planned users of this guideline are all health care providers including direct care staff working with older adults, policy makers, educators, and administrators.¹⁰

Interventions

The interventions considered for patients in wheelchairs were: assessing balance and mobility limitations; environment and equipment safety; safe patient handling; and staff training and information for patients and families.¹⁰

The interventions considered for patients with delirium were: assessing and addressing risk factors or complications of delirium, environment safety, fall risk assessment, and restraints.¹⁰

Outcomes

The outcome considered in the included guideline was falls.¹⁰

Summary of Critical Appraisal

Additional details regarding the strengths and limitations of the included publication are provided in Appendix 3.

Evidence-Based Guideline

The WRHA guideline¹⁰ had a clearly described scope and purpose through specific descriptions of the overall objectives, health questions, and target populations. The guideline development group included individuals from all relevant professional groups (Australian Commission on Safety and Quality in Health Care and Regional Falls Prevention Leadership Committee). The views and preferences of the target population were sought (stakeholder feedback across the Winnipeg Regional Health Authority), and a clear definition of the target users was provided (i.e., all health care providers including direct care staff working with older adults, policy makers, educators, and administrators). In

general, the guideline was developed through a rigorous process that involved: systematic methods to search for the evidence; consideration of the health benefits, side effects, and risks in formulating the recommendations; an explicit link between the recommendations and supporting evidence; external review prior to publication; and provision of a procedure by which the guideline may be updated. However, the criteria used to select the evidence were not described, the strengths and limitations of the body of evidence were not reported, and the methods for formulating the recommendations were unclear. The guideline was clearly presented through specific and unambiguous recommendations, clear presentation of different options for management of the condition, and clearly indicated key recommendations. The guideline described facilitators and barriers to its application, provided advice and tools on how to implement these recommendations, and presented monitoring and auditing criteria. However, this guideline fails to provide potential resource implications of applying the recommendations. The guideline is editorially independent in that it is unlikely that the views of the funding body have influenced guideline content, but exact conflicts of interest of guideline development group members were not listed or addressed.¹⁰

Summary of Findings

Appendix 4 presents a table of the main study findings and authors' conclusions.

Evidence-Based Guideline

Fall Prevention for Patients in Wheelchairs

The WRHA guideline recommends involving an occupational therapist or physiotherapist as part of a multifactorial fall prevention intervention to develop individualized gait, balance and functional coordination exercises (based on level II evidence).¹⁰ Level II evidence is evidence obtained from at least one properly designed randomized controlled trial. This guideline additionally recommends: that patients exercising in wheelchairs be under the supervision of trained professionals; an assessment of a patient's ability to use their wheelchair and whether this mobility aid is appropriate for the patient's needs; ensuring the wheelchair is an appropriate height for the patient and is in good working order; providing education on or review of wheelchair safety with patients and their caregivers; and ensuring that a proper transfer method for the patient is assessed, clearly communicated, and consistently applied. These additional recommendations were based on clinical experience and expert consensus due to the absence of strong evidence.¹⁰

Fall Prevention for Patients with Delirium

The WRHA guideline recommends fall risk assessment for older adults with cognitive impairments such as delirium (based on expert opinion).¹⁰ A multifactorial fall prevention intervention addressing the identified fall risk factors is recommended by this guideline for patients in long-term facilities (based on level I evidence) and in acute care facilities (based on level II evidence). Level I evidence is evidence obtained from a systematic review of all relevant randomized controlled trials; level II evidence is evidence obtained from at least one properly designed randomized controlled trial. This guideline additionally recommends: assessing for delirium and underlying causes of delirium; addressing the delirium and its causes via treatment with evidence-based interventions for delirium; reassessing presence of delirium after a fall; involving family and caregivers in intervention-related decisions; and that interventions which are effective in adults without cognitive impairments should not be withheld from patients with cognitive impairments, but rather modified to suit the individual

patient's situation. These additional recommendations were based on clinical experience and expert consensus due to the absence of strong evidence.¹⁰

The WRHA guideline recommends against the use of restraints, and suggests investigating reversible causes of agitation, wandering, delirium, and other fall risk behaviours prior to consideration of restraints as an option (based on expert opinion). The guideline stated that there is no evidence that restraints prevent falls or serious injuries and that there is evidence that restraints may cause death, injury, or infringement of autonomy, but importantly failed to provide the supporting evidence for these statements. The guideline also stated that in long-term care facilities, side rails may cause entrapment, serious injury, or death, but also failed to provide supporting evidence for this statement. These statements should be considered with caution due to the absence of supporting evidence. The guideline provided additional recommendations based on clinical experience and expert consensus due to the absence of strong evidence, as follows: focusing the care for patients with delirium on addressing delirium and the causes of delirium instead of trying to control patients through restraints; that all alternatives to restraints should be considered, discussed with the patient and caregivers, and trialed prior to restraint use; that if these alternatives are exhausted, then rationale and duration for using the restraints should be agreed upon and documented by the health care team, patients, family, and caregivers; that any restraint use should be reviewed regularly; and that if medications are used as a restraint, the minimal dose needed should be used and also reviewed and monitored to ensure the patient's safety.¹⁰

Fall Prevention in General

The WRHA guideline recommends multifactorial fall prevention interventions be routine care in acute and long-term care facilities (based on level I evidence).¹⁰ The guideline also recommends supervised exercise programs in acute care facilities as a method of reducing falls (based on level I evidence). Level I evidence is evidence obtained from a systematic review of all relevant randomized controlled trials. The guideline recommends this multifactorial fall prevention intervention be individualized by the patient's fall assessment (based on level II evidence). Level II evidence is evidence obtained from at least one properly designed randomized controlled trial. In acute care facilities, the WRHA guideline additionally recommends the following based on clinical experience and expert consensus due to the absence of strong evidence: addressing fall risk factors during admission or through discharge planning; screening older adults for fall risk and making referrals for fall prevention interventions; and managing fall risk factors which can have wider benefits beyond preventing falls.¹⁰

Limitations

During the screening process for this review, it was identified that much of the fall-related evidence was concerned with identifying fall risk factors. There was a paucity of evidence regarding the effectiveness of preventing falls by addressing or preventing these risk factors. Additionally, there were few guidelines specifically addressing the at-risk subgroups of patients in wheelchairs and patients with delirium.

While examining cost-effectiveness of particular interventions was not within the purview of this report, some of the recommended fall prevention measures would be anticipated to be costly. Information relating the cost-benefit trade-off of implementing these measures was not considered in the included guideline.

The included guideline assessed the quality of the evidence supporting its recommendation but did not provide ratings for the strength of the recommendations. Guideline recommendations referencing strength of supporting evidence inform clinical judgement. Due to an absence of strong evidence, the guideline provided good practice points based on clinical experience and expert consensus. Strong statements related to the benefits and harms of restraints were made without providing supporting evidence. Any recommendation regarding chemical or physical restraints should be interpreted with caution.¹⁰

Conclusions and Implications for Decision or Policy Making

One evidence-based guideline was included in this review which addressed fall prevention for both patients in wheelchairs and patients with delirium.¹⁰

Overall, the WRHA guideline recommends multifactorial fall prevention interventions (which include occupational therapy, physiotherapy, and supervised exercise) for patients in wheelchairs. Additionally, this guideline recommends ensuring that the wheelchair is appropriate for the patient and that the patient is using it properly, including using proper transfer techniques and wheelchair maintenance.¹⁰

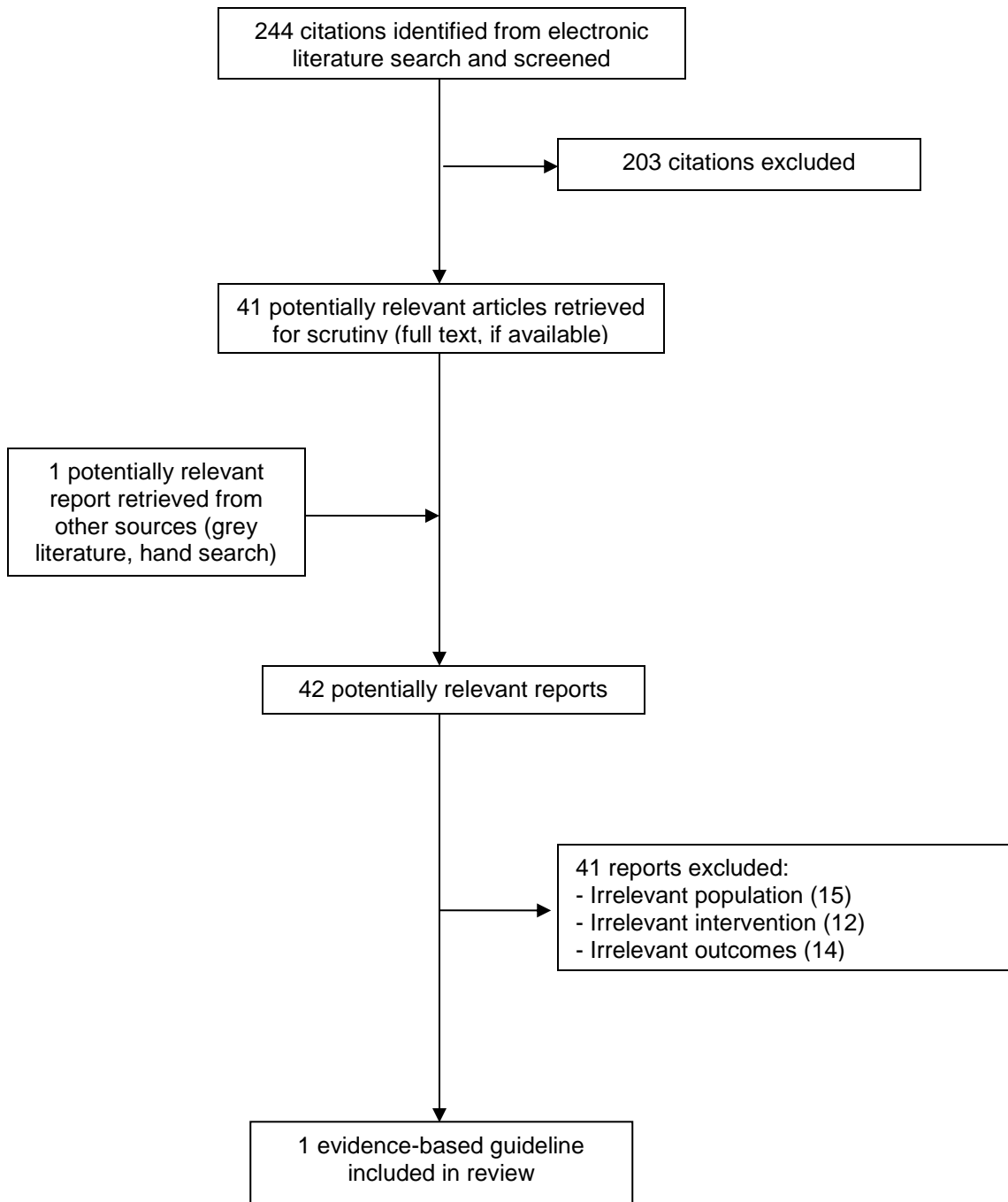
In general, for patients with delirium, the WRHA guideline recommends assessment, prevention, and treatment of delirium itself, as well as conducting a fall risk assessment to inform multifactorial fall-prevention strategies unique to each patient. Physical or pharmacological restraints are not recommended for these patients unless all other options have been exhausted.¹⁰

The included guideline assessed the quality of the evidence supporting its recommendations but did not provide ratings for the strength of the recommendations. Several recommendations were based on clinical experience and expert consensus in the absence of strong evidence, and one recommendation was made without providing any supporting evidence. In particular, recommendations regarding chemical or physical restraints should be interpreted with caution.¹⁰

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Appendix 1: Selection of Included Studies



Appendix 2: Characteristics of Included Publication

Table 2: Characteristics of Included Guideline

Intended Users, Target Population	Intervention and Practice Considered	Major Outcomes Considered	Evidence Collection, Selection, and Synthesis	Evidence Quality Assessment	Recommendations Development and Evaluation	Guideline Validation
WRHA, 2011 ¹⁰						
<p>Intended Users All health care providers including direct care staff working with older adults, policy makers, educators, and administrators</p> <p>Target Population Adults over the age of 65 or any adult at risk of falling - Winnipeg Region, Canada</p>	<p>Fall Prevention Strategies</p> <ul style="list-style-type: none"> - Falls prevention interventions - Balance and mobility limitations - Cognitive impairment - Restraints 	Falls	Comprehensive literature review was conducted to identify currently published systematic reviews, meta-analyses, and clinical practice guidelines.	<p>Evidence quality assessed using levels of evidence.</p> <ul style="list-style-type: none"> - Level I = Evidence obtained from a systematic review of all relevant randomized controlled trials - Level II = Evidence obtained from at least one properly designed randomized controlled trial - No level stated = Evidence obtained from expert opinion - No level indicated = areas without strong research evidence but are deemed important based on clinical experience or expert consensus 	<p>Exact methodology of recommendation development was unclear.</p> <p>Strength of recommendations not evaluated.</p>	Stakeholder feedback.

WRHA = Winnipeg Regional Health Authority.

Appendix 3: Critical Appraisal of Included Publication

Table 3: Strengths and Limitations of Guideline using AGREE II¹¹

Item	Guideline
	WRHA, 2011 ¹⁰
Domain 1: Scope and Purpose	
1. The overall objective(s) of the guideline is (are) specifically described.	Yes
2. The health question(s) covered by the guideline is (are) specifically described.	Yes
3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.	Yes
Domain 2: Stakeholder Involvement	
4. The guideline development group includes individuals from all relevant professional groups.	Yes
5. The views and preferences of the target population (patients, public, etc.) have been sought.	Yes
6. The target users of the guideline are clearly defined.	Yes
Domain 3: Rigour of Development	
7. Systematic methods were used to search for evidence.	Yes
8. The criteria for selecting the evidence are clearly described.	No
9. The strengths and limitations of the body of evidence are clearly described.	No
10. The methods for formulating the recommendations are clearly described.	Unclear
11. The health benefits, side effects, and risks have been considered in formulating the recommendations.	Yes
12. There is an explicit link between the recommendations and the supporting evidence.	Yes
13. The guideline has been externally reviewed by experts prior to its publication.	Yes
14. A procedure for updating the guideline is provided.	Yes
Domain 4: Clarity of Presentation	
15. The recommendations are specific and unambiguous.	Yes
16. The different options for management of the condition or health issue are clearly presented.	Yes
17. Key recommendations are easily identifiable.	Yes
Domain 5: Applicability	
18. The guideline describes facilitators and barriers to its application.	Yes
19. The guideline provides advice and/or tools on how the recommendations can be put into practice.	Yes
20. The potential resource implications of applying the recommendations have been considered.	No
21. The guideline presents monitoring and/or auditing criteria.	Yes
Domain 6: Editorial Independence	
22. The views of the funding body have not influenced the content of the guideline.	Yes
23. Competing interests of guideline development group members have been recorded and addressed.	No

AGREE II = Appraisal of Guidelines for Research and Evaluation II, WRHA = Winnipeg Regional Health Authority.

Appendix 4: Main Study Findings and Authors' Conclusions

Table 4: Summary of Recommendations in Included Guideline

Recommendations	Strength of Evidence and Recommendations
WRHA, 2011 ¹⁰	
<p>Patients requiring Wheelchairs <u>Balance and Mobility Limitations – Long-Term Care Facilities</u> <i>“Involve occupational therapy and / or physiotherapy to develop supervised and individualized balance and gait exercises as part of a multifactorial intervention to reduce the risk of falls and fractures in personal care home residents.” (p. 32)</i> - Based on evidence from one systematic review</p> <p><i>“Consider using gait, balance and functional coordination exercises as single interventions.” (p. 32)</i> - Based on evidence from two randomized controlled trials</p> <p><i>“Good practice points:</i> - <i>Exercise should be supervised and delivered by appropriately trained individuals.</i> - <i>Assess the resident’s ability to use mobility aids including walkers, wheelchairs, etc.</i> - <i>Assess chairs, wheelchair and seating systems to ensure that they are appropriate for the resident’s needs.</i> - <i>Ensure assistive devices are an appropriate height for resident and within easy reach.</i> - <i>Ensure all assistive devices are in good working order.</i> - <i>Review education on safety with mobility aids with the resident and caregivers if applicable.</i> - <i>Ensure that the proper transfer method / logo for the resident is assessed, communicated and consistently applied. For residents requiring total assistance, ensure appropriate sling, correct sling size, integrity of sling and transfer logo.” (p. 32)</i></p>	<p>Level II: Evidence obtained from at least one properly designed randomized controlled trial.</p> <p>Level II: Evidence obtained from at least one properly designed randomized controlled trial.</p> <p>No level indicated. Area without strong research evidence but deemed important based on clinical experience or expert consensus.</p>
<p>Patients with Delirium <u>Cognitive Impairment – Acute Care Facilities</u> <i>“Older adults with cognitive impairment should have their risk factors for falls assessed.” (p. 18)</i></p> <p><i>“Identified falls risk factors should be addressed as part of a multifactorial falls prevention program, and injury minimization strategies (such as using hip protectors or vitamin D and calcium supplementation) should be considered.” (p. 18)</i> - Based on evidence from three randomized controlled trials</p> <p><i>“Good practice points:</i> - <i>Older adults presenting to a hospital with an acute change in cognitive function should be assessed for delirium and the underlying cause of this change.</i> - <i>Older adults with gradual onset, progressive cognitive impairment should undergo detailed assessment to determine diagnosis and, where possible, reversible causes of the cognitive decline.</i> - <i>Older adults with delirium should receive evidence based interventions to manage the delirium.</i> - <i>If an older adult with cognitive impairment does fall, reassess their cognitive status, including presence of delirium.</i> - <i>Where possible and appropriate, involve family and caregivers in decisions about which interventions to use, and how to use them. Family and caregivers know the older adult and may be able to suggest ways to support them.</i></p>	<p>No level stated. Evidence obtained from expert opinion.</p> <p>Level II: Evidence obtained from at least one properly designed randomized controlled trial.</p> <p>No level indicated. Area without strong research evidence but deemed important based on clinical experience or expert consensus.</p>

Table 4: Summary of Recommendations in Included Guideline

Recommendations	Strength of Evidence and Recommendations
<ul style="list-style-type: none"> - <i>Interventions shown to work in cognitively intact populations should not be withheld from cognitively impaired populations; however, interventions for older adults with cognitive impairment may need to be modified and supervised, as appropriate.</i> (p. 18) 	
<p><u>Cognitive Impairment – Long-Term Care Facilities</u> <i>“Residents with cognitive impairment should have other falls risk factors assessed.”</i> (p. 33)</p> <p><i>“Address identified falls risk factors as part of a multifactorial falls prevention program, and consider injury minimization strategies such as hip protectors or vitamin D and calcium supplementation.”</i> (p. 33)</p> <ul style="list-style-type: none"> - Based on evidence from one systematic review <p><i>“Good practice points:</i></p> <ul style="list-style-type: none"> - <i>Address all reversible causes of acute or progressive cognitive decline.</i> - <i>Residents presenting with an acute change in cognitive function should be assessed for delirium and the underlying cause of this change.</i> - <i>Residents with gradual-onset, progressive cognitive impairment should undergo detailed assessment to determine diagnosis and, where possible, reversible causes of the cognitive decline. Reversible causes of acute or progressive cognitive decline should be treated.</i> - <i>If a resident with cognitive impairment does fall, reassess his / her cognitive status, including presence of delirium.</i> - <i>Interventions shown to work in cognitively intact populations should not be withheld from cognitively impaired populations; however, interventions for adults with cognitive impairment may need to be modified and supervised as appropriate.”</i> (p. 33) 	<p>No level stated. Evidence obtained from expert opinion.</p> <p>Level I: Evidence obtained from a systematic review of all relevant randomized controlled trials.</p> <p>No level indicated. Area without strong research evidence but deemed important based on clinical experience or expert consensus.</p>
<p><u>Restraints – Acute Care Facilities</u> <i>“Before restraint use is considered, causes of agitation, wandering and other behaviors should be investigated, and reversible causes of these behaviors (e.g. delirium) should be treated.”</i> (p. 25)</p> <p><i>“Note: there is no evidence that physical restraints reduce the incidence of falls or serious injuries in older adult. There is evidence that restraints can cause death, injury or infringement of autonomy. Therefore, restraints should be considered the last option for older adults who are at risk of falling.”</i> (p. 25)</p> <p>These statements should be considered with caution due to the absence of supporting evidence.</p> <p><i>“Good practice points:</i></p> <ul style="list-style-type: none"> - <i>The focus of caring for older adults with behavioral issues should be on responding to the older adult’s behavior and understanding its cause, rather than attempting to control it.</i> - <i>All alternatives to restraint should be considered and trialed for older adults with cognitive impairment, including delirium.</i> - <i>If all alternatives are exhausted, the rationale for using restraints must be documented and an anticipated duration agreed on by the health care team.</i> - <i>If medications are used specifically to restrain an older adult, the minimal dose should be used and the older adult should be reviewed and monitored to ensure his / her safety. Chemical restraint must not be a substitute for quality care.</i> - <i>Any restraint use should be agreed on by the health care team, and discussed with the older adult, family or caregivers.”</i> (p. 25) 	<p>No level stated. Evidence obtained from expert opinion.</p> <p>No level stated. Evidence obtained from expert opinion.</p> <p>No level indicated. Area without strong research evidence but deemed important based on clinical experience or expert consensus.</p>
<p><u>Restraints – Long-Term Care Facilities</u></p>	<p>No level stated. Evidence obtained from expert opinion.</p>

Table 4: Summary of Recommendations in Included Guideline

Recommendations	Strength of Evidence and Recommendations
<p><i>“Causes of agitation, wandering or other behaviors should be investigated, and reversible causes of these behaviors (e.g. delirium) should be treated before the use of restraint is considered.” (p. 40)</i></p>	
<p><i>“Note: physical restraints (including side rails) should be considered the last option for residents who are at risk of falling because there is no evidence that their use reduces incidents of falls or serious injuries in older adults. There is evidence that physical restraints can cause death, injury, or infringement of autonomy. Side rails have been shown to cause entrapment, serious injury, and death.” (p. 40)</i></p> <p>These statements should be considered with caution due to the absence of supporting evidence.</p> <p><i>“Good practice points:</i></p> <ul style="list-style-type: none"> - <i>The focus of caring for residents with behavioral issues should be on responding to the resident’s behavior and understanding its cause, rather than attempting to control it.</i> - <i>All alternatives to restraints should be considered, discussed with family and caregivers, and trialed. Examples of restraint alternatives include: individualizing resident’s routine-sleep patterns, activity patterns, toileting routines, and rehabilitation and exercise programs; companionship; and environmental considerations.</i> - <i>If all alternatives are exhausted, the rationale for using restraint must be documented and an anticipated duration agreed on by the health care team, in consultation with family and caregivers, and reviewed quarterly.</i> - <i>If medications are used specifically to restrain a resident, the minimal dose should be used and the resident reviewed and monitored to ensure his / her safety. Chemical restraint must not be a substitute for quality care.” (p. 40)</i> 	<p>No level stated. Evidence obtained from expert opinion.</p> <p>No level indicated. Area without strong research evidence but deemed important based on clinical experience or expert consensus.</p>
<p>General <u>Falls Prevention Interventions – Acute Care Facilities</u> <i>“A multifactorial approach to preventing falls should be part of routine care for all older adults in hospitals.” (p. 14)</i></p> <ul style="list-style-type: none"> - Based on evidence from two systematic reviews <p><i>“Supervised exercise interventions have been shown to reduce the risk of falling in hospital settings.” (p. 14)</i></p> <ul style="list-style-type: none"> - Based on evidence from one systematic review <p><i>“Develop and implement a targeted and individualized falls prevention plan of care based on the findings of a falls screen or assessment.” (p. 14)</i></p> <ul style="list-style-type: none"> - Based on evidence from three randomized controlled trials <p><i>“Good practice points:</i></p> <ul style="list-style-type: none"> - <i>Interventions should systemically address the risk factors identified, either during the admission or, if this is not possible, through discharge planning and referral to community services.</i> - <i>Screen older adults for falls risk and functional ability, and ensure that referrals for follow-up falls prevention interventions are in place.</i> - <i>Managing many of the risk factors for falls (e.g. delirium or balance problems) will have wider benefits beyond falls prevention.” (p. 14)</i> <p><u>Falls Prevention Interventions – Long-Term Care Facilities</u></p>	<p>Level I: Evidence obtained from a systematic review of all relevant randomized controlled trials.</p> <p>Level I: Evidence obtained from a systematic review of all relevant randomized controlled trials.</p> <p>Level II: Evidence obtained from at least one properly designed randomized controlled trial.</p> <p>No level indicated. Area without strong research evidence but deemed important based on clinical experience or expert consensus.</p>

Table 4: Summary of Recommendations in Included Guideline

Recommendations	Strength of Evidence and Recommendations
<p><i>“A multifactorial approach using standard falls prevention interventions and provided by an interprofessional team should be routine care for all residents of personal care homes / long term care facilities.” (p. 30)</i></p> <ul style="list-style-type: none"> - Based on evidence from one systematic review 	<p>Level I: Evidence obtained from a systematic review of all relevant randomized controlled trials.</p>
<p><i>“In addition to a multifactorial approach using standard falls prevention interventions, develop and implement a targeted and individualized falls prevention plan of care based on the findings of a falls screen or assessment.” (p. 30)</i></p> <ul style="list-style-type: none"> - Based on evidence from one cluster-randomized trial 	<p>Level II: Evidence obtained from at least one properly designed randomized controlled trial.</p>

WRHA = Winnipeg Regional Health Authority.

Appendix 5: Additional References of Potential Interest

Management of Delirium

Delirium (at risk) in the surgical patient. (Evidence informed guideline). Winnipeg (MB): Winnipeg Regional Health Authority; 2012: <http://www.wrha.mb.ca/extranet/eipt/files/EIPT-014-001.pdf>. Accessed 2016 Jul 6
Not specific to fall prevention.

Grover S, Avasthi A. Clinical Practice Guidelines for Management of Delirium in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S329-s340. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5840908/>
Guideline with unclear methodology.

Delirium, Seniors – Inpatient v 1.1. (Provincial Clinical Knowledge Topic). Edmonton (AB): Alberta Health Services; 2017: <https://extranet.ahsnet.ca/teams/policydocuments/1/klink/et-klink-ckv-delirium-seniors-inpatient.pdf>. Accessed 2019 Jul 6
Knowledge topic with unclear methodology.

Fall Prevention

Canadian Fall Prevention Education Collaborative. CFPC E-learning. (*Canadian Fall Prevention Curriculum*); 2013. <http://www.canadianfallprevention.ca/cfpc-e-learning/Curriculum>
Curriculum with unclear methodology.

Ganz DA HC, Saliba D, et al. Preventing Falls in Hospitals: A Toolkit for Improving Quality of Care. (Prepared by RAND Corporation, Boston University School of Public Health, and ECRI Institute under Contract No. HHS290201000017I TO #1.). Rockville (MD): Agency for Healthcare Research and Quality; 2013: https://www.ahrq.gov/sites/default/files/publications/files/fallpxtoolkit_0.pdf. Accessed 2019 Jul 6
Toolkit with unclear methodology.

Falls in older people: assessing risk and prevention. NICE clinical guideline CG161. London (GB): National Institute for Health and Care Excellence; 2013: <https://www.nice.org.uk/guidance/cg161>. Accessed 2019 Jul 6
Evidence-based guideline on fall prevention not specific to patients in wheelchairs or patients with delirium.

Summary of the Updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. J Am Geriatr Soc. 2011 Jan;59(1):148-157. <https://doi-org.proxy1.lib.uwo.ca/10.1111/j.1532-5415.2010.03234.x>
Evidence-based guideline summary on fall prevention not specific to patients in wheelchairs or patients with delirium.

Preventing Falls and Reducing Injury from Falls. (Clinical Best Practice Guidelines). Fourth ed. Toronto (ON): Registered Nurses' Association of Ontario; 2017:

https://rnao.ca/sites/rnao-ca/files/bpg/FALL_PREVENTION_WEB_1207-17.pdf Accessed 2019 Jul 6

Evidence-based guideline on fall prevention not specific to patients in wheelchairs, patients with delirium, or adults in institutionalized care.

Universal Falls Precautions (SAFE). Edmonton (AB): *Covenant Health*; 2016:

http://extcontent.covenanthealth.ca/PatientResident/PatientResident_Schmid_FRM_Refere_nce_20160630.pdf

Quick reference guide for fall prevention with unclear methodology.