

Evidence *in* Context

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Exercise in Long-Term Care
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*Celebrating the 10th Anniversary of the
Contextualized Health Research Synthesis Program*



Health research – synthesized and contextualized for use in Newfoundland & Labrador

Exercise Interventions for Long-Term Care *in* Newfoundland & Labrador

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Given the importance of healthy aging strategies for our provincial healthcare system, our six health system partners asked the Contextualized Health Research Synthesis Program (CHRSP) to evaluate the evidence for interventions involving physical activity and exercise programming with a view to improving daily functioning among frail elderly residents within the province's Long-Term Care (LTC) facilities.

CHRSP assembled a project team that included Subject Matter Expert Isabelle J. Dionne, PhD., a Canada Research Chair in Exercise Recommendations for Healthy Aging at the Université de Sherbrooke. The Health System Leader for the project was David Diamond, CEO of Eastern Health. Our project team also included representatives from Eastern Health, Central Health, Western Health, Memorial University, the provincial Department of Children, Seniors, and Social Development, and the provincial Department of Health and Community Services.

Since the initial research question was very broad in scope, the Project Team worked together to clarify the project's parameters by limiting the specific populations, interventions, and outcomes that would be studied. The Team achieved consensus that the

research question for the project would focus on exercise-based interventions that have been shown to be effective in improving the day-to-day functioning of physically frail elderly in long-term care facilities. Only the following interventions were deemed eligible for consideration: interventions that require no equipment or minimal equipment; interventions that can be

carried out on site within a long-term care facility; and interventions that would not specifically exclude persons with dementia from participating. As we searched for relevant systematic reviews and recent primary studies, the inclusion criteria for this project allowed us

to consider a range of intervention/ outcome combinations. The interventions studied were: Multifactorial Interventions; Physical Rehabilitation; Step Training, and Tai-Chi. Outcomes under study were: Activities of Daily Living; Balance; Risk/ Rate of Falls; Gait; Mobility; Timed-Up-and-Go; and Walking Speed.

This report summarizes our key findings and the results of our contextualization interviews. On the final page, readers will find a series of implications that health system decision makers may wish to consider when developing exercise programs in Newfoundland & Labrador's long-term care facilities.



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The Research Question:

What exercise-based interventions have been shown to be effective in improving the day-to-day functioning of physically frail elderly in long-term care (LTC) facilities?"

Disclaimer: This document is an executive summary of a larger report that contains fully-referenced material. We have omitted references from this summary for the sake of brevity, but readers who wish to review the fully-referenced report are encouraged to do so at <http://www.nlcahr.mun.ca/CHRSP/> together with an online companion document describing the methodology, data extraction and detailed synthesis results.

Read the full report here: <http://www.nlcahr.mun.ca/CHRSP/>

What evidence did we find for this study?

Our research team located 13 eligible systematic reviews that examined four types of intervention and addressed seven outcomes, as summarized in Table 1.

Unfortunately, several challenges arose in synthesizing the results from these studies:

- Most of the included systematic reviews were rated as being of weak or very weak quality. Only 5 of the 13 included studies were of sufficient quality to support robust conclusions.
- There was virtually no overlap in the reported Intervention/Outcome combinations in the included studies. This lack of consistency reduced our capacity to combine findings from different systematic reviews and meant that we could draw only limited conclusions from the evidence.
- None of the high-quality evidence in the synthesis examined the *frail* elderly population that was the subject population for this study.
- A lack of consistent definitions for the terms '*frail*' and '*frailty*' posed challenges when interpreting the findings.
- Similarly, the definition of long-term care used in Newfoundland & Labrador differs from that used in the literature. As a result, patient populations in NL LTC facilities were not comparable to the populations described in the literature, either in terms of frailty or healthcare needs.
- There were too few recent primary research studies that had not been included in the systematic review literature for us to reach definitive conclusions regarding *frail* populations.
- Although the literature was less fragmented for *non-frail* populations, it was still heterogeneous enough to limit confidence in drawing conclusions.

Table 1: Summary of strength of evidence for exercise interventions

Moderate-to-strong evidence (conclusions may be drawn)	
Strength of Evidence	Intervention/Outcome/ Population
Strong Body of Evidence showing intervention is effective	<ul style="list-style-type: none"> • Step Training for improving falls rate in exclusively or primarily <i>non-frail elderly</i>
Moderate Body of Evidence showing intervention is effective	<ul style="list-style-type: none"> • Physical Rehabilitation for improving Activities of Daily Living (ADL) Barthel scores in exclusively or primarily <i>on-frail elderly</i>
Moderate Body of Evidence showing intervention makes no difference	<ul style="list-style-type: none"> • Physical Rehabilitation for timed up-and-go and walking speed in exclusively or primarily <i>non-frail elderly</i>
Very weak to weak evidence (inconclusive findings)	
Strength of Evidence	Intervention/Outcome/ Population
Weak or Very Weak Body of Evidence showing intervention is effective	<ul style="list-style-type: none"> • Multifactorial Interventions for improving gait in <i>frail elderly</i> • Physical Rehabilitation for improving mobility in <i>non-frail elderly</i> • Step Training to improve single-leg balance, risk of falls and timed-up-and-go in <i>non-frail elderly</i>
Weak or Very Weak Body of Evidence showing intervention makes no difference	<ul style="list-style-type: none"> • Multifactorial Interventions for falls rate and risk of falls in <i>non-frail elderly</i> • Physical Rehabilitation for ADL Functional Independence Measures in <i>non-frail elderly</i> • Step Training for Balance-Berg, Balance-Reach, and walking speed in <i>non-frail elderly</i> • Tai Chi for balance and gait in <i>frail elderly</i>

Ultimately, the limited conclusions we *could* draw from the evidence indicated that for *non-frail* LTC populations, step training, either volitional or reactive, is associated with a reduced risk of falls. Physical rehabilitation is associated with improved ADL in *non-frail* populations and has also been shown to have possible, but not conclusive, positive effects on timed up-and-go (TUG) scores in *non-frail* populations. Physical rehabilitation had a non-significant impact on walking speed in *non-frail* populations. Unfortunately, the body of evidence for both multifactorial interventions and for Tai Chi for the *frail* elderly was too weak; as a result, we were unable to draw any conclusions about the effectiveness of these interventions.

Summary of Key Synthesis Findings

1. The research evidence addressing exercise interventions for residents of long-term care facilities is limited in both quantity and quality. The bodies of evidence strong enough to be more conclusive pertain to **non-frail elderly**. Unfortunately, findings for the physically **frail elderly** are not strong enough to support reliable conclusions.
2. A strong body of evidence indicates that step training is effective to reduce the rate of falls among *non-frail elderly* living either in Long-Term Care (LTC) or in the community.
3. Step training may also be effective to reduce the risk of falls among *non-frail elderly*; however, additional evidence is required in order to draw any firm conclusions.
4. The evidence for physical rehabilitation to improve Activities of Daily Living (ADL) is inconsistent, likely as a result of the wide range of interventions that are considered to be “physical rehabilitation.” Some specific types of physical rehabilitation may improve ADL for non-frail elderly populations, while others may not, and the evidence is not clear about which types of rehabilitation are effective/ineffective.
5. Moderate bodies of evidence indicate that, for non-frail populations, physical rehabilitation does not make consistent or significant improvements to timed-up-and-go or to walking speed.
6. The evidence does not indicate whether or not volunteers can effectively deliver exercise-based interventions for LTC residents, either frail or non-frail, to improve day-to-day functioning. In the literature, the most commonly-reported individuals delivering exercise interventions in LTC are health professionals, such as physiotherapists.

Exercise in Long-Term Care: the Newfoundland & Labrador Context

Our researchers interviewed health system officials, clinicians, and other stakeholders to identify the contextual factors for Newfoundland & Labrador that may have an impact on the effectiveness, feasibility or acceptability of the studied interventions. The results of these interviews are included in the full report. Key contextual factors are summarized below:

The lack of uniformity in determining who in LTC is considered to be ‘frail’ poses problems when planning exercise programming. Neither the province’s health system as a whole nor any of its regional health authorities uses a standardized definition. As frailty is a key factor in determining appropriate exercise interventions, introducing exercise programming in LTC across the province will require developing the capacity to distinguish frail from non-frail LTC residents.

Our key informants were skeptical that there are sufficient health human resources to implement LTC exercise programs, even on a group basis. Our consultants agreed that, while recreational therapists, physiotherapists and nursing staff in this province would likely support the underlying principle of exercise programming for LTC residents, it would be difficult to add the administration and delivery of regular, even weekly, exercise programs to their current workloads.

Step-training for groups of non-frail seniors would be problematic from a safety standpoint because it would require a fall-arrest system. Conversely, step-training in a one-on-one setting would be feasible from a safety standpoint but not as far as human resource and equipment requirements are concerned.

Several informants noted that exercise could have a greater impact on LTC residents if it were to be introduced earlier in their lifespan. Persons entering LTC facilities usually have impaired functionality; this makes organized exercise challenging. While continued losses of functionality may be slowed by exercise, a large amount of work may be needed in order to produce improvements. Starting exercise interventions earlier in the lifespan would help to mitigate these issues.

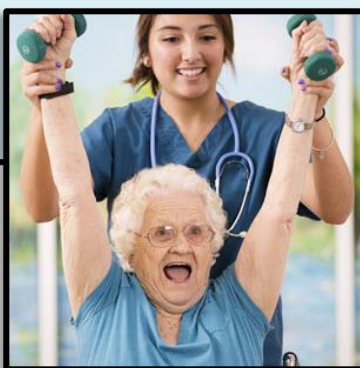
Several informants noted that encouraging LTC residents to engage in activities of daily living (ADL) on their own seems to be associated with enhanced function and better quality of life. These informants noted that encouraging residents to engage in individually-appropriate behaviors could encourage ADL preservation.

Contextualized Synthesis: Exercise in Long-Term Care

Implications for Decision Makers

When decision makers consider the findings from this research evidence in the context of Newfoundland & Labrador, the following points should be borne in mind:

1. The research evidence addressing exercise interventions for residents of long-term care facilities is limited in quantity and quality. The only bodies of evidence strong enough to draw conclusions pertain to ***non-frail elderly*** and not to the ***frail elderly*** who were the target population for this report. Given this situation, caution should be exercised interpreting the following implications.
2. Physical frailty is a key criterion for determining whether exercise is a suitable intervention for a person living in long-term care; however, there is no province-wide approach to assessing frailty; indeed, there may be substantial differences between populations deemed “frail” in different long-term care facilities within the province. This lack of a uniform definition presents implementation challenges for any exercise intervention.
3. Currently, some exercise activities are being supported by physiotherapists in some of our LTC facilities for some residents, but these interventions are individually-tailored. Implementing individually-tailored exercise programs, including step training (which may be effective for *non-frail* elderly), for larger numbers of residents with sufficient frequency and duration to be effective would require additional human resources, notably physiotherapists, recreational therapists, kinesiologists, and/or nursing staff.
4. Group delivery of step training programs, which again may be effective for *non-frail* elderly, might be less costly than one-on-one programs but this approach presents its own set of logistical challenges, including space and equipment requirements.
5. To promote healthier aging, two other kinds of programs may be worth investigating in Newfoundland & Labrador—exercise programming for seniors still living in the community and function-focused care that encourages more movement by seniors in LTC in their activities of daily life.



For the complete CHRSP report, including details on the evidence reviewed by the project team, and for more information about the CHRSP process, please visit the NLCAHR website: <http://www.nlcahr.mun.ca/CHRSP/>