Nutritional Interventions for the Delayed Progression or Reversal of Frailty: Clinical Effectiveness
SUMMARY OF ABSTRACTS  Nutritional Interventions for the Delayed Progression or Reversal of Frailty

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Acknowledgments:

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Research Question

What is the effectiveness of nutritional interventions for delaying or reversing the progression of frailty in those with frailty?

Key Findings

One systematic review and five randomized controlled trials were identified regarding the effectiveness of nutrition interventions to reverse or delay the progression of frailty in those with frailty.

Methods

A limited literature search was conducted on key resources PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit the retrieval to health technology assessments, systematic reviews, and meta-analyses, and randomized controlled trials. The search was limited to English language documents published between January 1, 2011 and May 14, 2018. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

<table>
<thead>
<tr>
<th>Population</th>
<th>Patients with frailty (living in the community, living in long term care, or in acute care)</th>
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<tbody>
<tr>
<td>Intervention</td>
<td>Nutritional interventions</td>
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<tr>
<td>Comparator</td>
<td>Usual Care</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Effectiveness and clinical benefit from the patient standpoint, patient-centred outcomes; e.g.</td>
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<tr>
<td></td>
<td>• Quality of life improvements</td>
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<td></td>
<td>• Improvements on a frailty scale</td>
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<td></td>
<td>• Improvements in functional status</td>
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<td></td>
<td>• Increased muscle strength or stamina</td>
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<td></td>
<td>• Healthcare utilization/need for interventions (need for a trip to the ER, length of stay)</td>
</tr>
<tr>
<td>Study Designs</td>
<td>Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies</td>
</tr>
</tbody>
</table>
Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and non-randomized studies.

One systematic review and five randomized controlled trials were identified regarding the effectiveness of nutritional interventions to reverse or delay the progression of frailty in those with frailty. No relevant health technology assessments, meta-analyses, or non-randomized studies were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

One systematic review and five randomized controlled trials were identified regarding the effectiveness of nutritional interventions to reverse or delay the progression of frailty in those with frailty.

According to one systematic review, supplementation of vitamin D and proper nutrition were effective measures to reduce frailty. Three randomized studies examined improvements in functional status. In one study, older adults with frailty taking a nutrient supplement (l-leucine and cholecalciferol enriched supplement with medium-chain triglycerides) for three months increased their walking speed. No improvements were observed in a second group given the same nutrient supplement plus long-chain triglycerides, or in a control group. The authors of two other RCTs examined protein supplementation and functional status, with both studies showing an overall greater effect of protein supplementation relative to a control group.

One RCT showed that twelve weeks of protein supplementation generally increased physical functioning versus a control group. Specifically, mobility/static and dynamic balance improved and physical performance remained stable in the protein supplement intervention group, while both decreased in controls. Paradoxically, there was a greater decrease in usual gait speed in the protein supplement intervention group versus the control group. The second RCT showed that, after six weeks of a traditional weight loss regimen control condition or a high-protein weight loss regimen in frail adults with obesity, the protein group experienced comparatively greater improvements in function.

Three randomized studies examined increased muscle strength or stamina. In one RCT, older adults with frailty in a high intensity resistance training program were randomized to a protein supplement intervention or no-supplement control. The intervention group experienced greater improvements in grip strength and knee extensor force versus the control group. In a second RCT, older adults with frailty who were randomized to take a nutrient supplement (l-leucine and cholecalciferol enriched supplement with medium-chain triglycerides) for three months increased their right-hand grip strength, improved their 10-second leg open-and-close test performance, and increased peak expiratory flow. No improvements in strength were observed in a second group given the same nutrient supplement plus long-chain triglycerides, or in a control group.

One RCT examined the effect of caloric restriction on strength in older adults with frailty and obesity and showed that there was no difference in knee extension and flexion between
those patients randomized to a year-long caloric restriction to induce and maintain a weight loss of 10% from baseline body weight versus a control condition.\(^6\)

No included studies examined quality of life improvements in relation to nutritional interventions. No included studies examined healthcare utilization or the need for interventions in relation to nutritional interventions.

**References Summarized**

**Health Technology Assessments**

No literature identified.

**Systematic Reviews and Meta-analyses**


**Randomized Controlled Trials**


**Frail with Obesity**


**Non-Randomized Studies**

No literature identified.
Appendix — Further Information

Systematic Reviews and Meta-Analyses

Alternative Population — Mixed (Frail and Pre-Frail Population)

   PubMed: PM29508691

   PubMed: PM29420989

Alternative Intervention — Combined (Nutrition and Physical Activity)

   PubMed: PM28490866

    PubMed: PM27670605

No Comparator

    PubMed: PM27823748

Randomized Controlled Trials

Alternative Intervention — Combined (Nutritional and Physical Activity)

    PubMed: PM27224505

Alternative Population (Pre-Frail and Frail) and Alternative Intervention (Combined - Nutritional and Physical Activity)

    PubMed: PM28972245

**Alternative Intervention – Combined (Nutrition and Physical Activity)**


**Non-Randomized Studies**

**Alternative Population – Mixed (Frail and Non-Frail)**


**Alternative Outcome**


**Alternative Intervention – Unspecified Nutritional Supplementation**