

## Clinical Nutrition Long Term Care EXECUTIVE SUMMARY

### Name of Expert Review Group:

Long Term Care

### Member:

### Site:

Jean Helps, Regional Clinical Nutrition Manager, LTC	WRHA, Nutrition and Food Services
Audrey Seddon, Community Dietitian	Health Services for the Elderly
Connie Dimen, Clinical Dietitian	Saul and Claribel Simkin Centre
Kathy Ladd, Clinical Dietitian	Health Sciences Centre
Susan Irvine, Clinical Dietitian	River Park Gardens, Golden Link Lodge & Vista Park Lodge
Tanya Smart, Clinical Dietitian	Deer Lodge Centre
Ad Hoc Member – Christina Lengyel	Associate Professor, Food & Human Nutritional Sciences, University of Manitoba

### Diets Included in the Review: (please list)

“Standard (Regular) 70+ Years” (previously LTC Standard)

### Rationale: (Overall Purpose, Goals, etc.)

**Background:** This document will identify the nutritional needs of adults over 70 years of age, in order to develop a diet for this population. Nutrient needs of all adults over the age of 70 were considered when developing the recommendations. It has been generally agreed that the risk of undernutrition rather than overnutrition is the main cause for concern in the elderly, particularly those who are hospitalized or institutionalized. The prevalence of malnutrition among the elderly in acute care and long term care facilities is 45% and 44% respectively<sup>1,2,3</sup>. Malnutrition has been shown to have important effects on recovery in a broad range of patients and conditions. It has been associated strongly with impaired immune response, impaired muscle and respiratory function, delayed wound healing, overall increased complications, longer rehabilitation, greater length of hospital stay and increased mortality<sup>4</sup>. As health declines and further aging occurs, there is a misconception that it is acceptable that the elderly may become malnourished<sup>5</sup>. It is noted that total food intake progressively decreases with age in all settings (community, hospital and long term care), which may result in nutrient needs not being met.

The overall goal is to ensure best practice is followed when providing menu options that are high-quality, palatable, culturally appropriate, and meet macronutrient and micronutrient needs. Dependent upon the demographics within a facility, facility specific menu options to meet the cultural and social needs of the population may be required. It is assumed that nutrient requirements are met through meals and between meal snacks. On an individual basis, the need for liberalization of the diet to promote intake should be considered, as well as the need for supplementation (either oral nutritional supplementation or vitamin/mineral supplementation).

### The goals of the Long Term Care Expert Review Group are as below:

**1.0** To review the literature regarding the nutritional needs of the older adult in terms of:

- 1.1 Meal Pattern
- 1.2 Energy
- 1.3 Protein
- 1.4 Fat
- 1.5 Carbohydrate
- 1.6 Fibre
- 1.7 Fluid
- 1.8 Sodium
- 1.9 Calcium
- 1.10 Vitamin D

**2.0** To identify gaps in nutrient provision and recommend modifications for correction

**3.0** To develop criteria for the diet for the older adult

**4.0** To rename the “LTC Standard Diet” to reflect the population the diet is intended for, rather than a setting that the diet may be provided in.

The WRHA Nutrition and Food Services menu was used as a baseline for assessment purposes. Specific comparisons will need to be completed within facilities that do not utilize this service.

### Recommendations (based on evidence review):

<b>Eating Well with Canada’s Food Guide (EWCFG)</b>	<i>Goal is to meet the minimum number of servings per day for each food group from meals and snacks for ages &gt;50 years:</i> Vegetables and Fruits – 7 servings/day Grain Products – 6-7 servings/day Milk and Alternatives – 3 servings/day Meat and Alternatives – 2-3 servings/day Additional servings available as requested/ required.
<b>Meal Pattern</b>	<ul style="list-style-type: none"> <li>• A minimum of a 21 day menu cycle (reviewed twice yearly) in LTC<sup>6</sup></li> <li>• Consideration of increasing choice in acute care where the menu cycle is less than 21 days</li> <li>• Between meal nourishments (snacks) should focus on fluids and protein.</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>• 1800-2500 kcal/ day with focus on nutrient dense foods.</li> </ul>
<b>Protein</b>	<ul style="list-style-type: none"> <li>• Minimum weekly average of 84 g protein/day</li> <li>• 25-30 g of protein/meal.</li> </ul>
<b>Fat</b>	<ul style="list-style-type: none"> <li>• 20-35% of total kcal/day, with focus at top of range.</li> <li>• Polyunsaturated Fatty Acids (PUFAs) – recommend fatty fish twice a week.</li> <li>• Emphasize healthy fats.</li> <li>• Trans fats – minimize content, trans fat free recommended.</li> <li>• No limit on dietary cholesterol</li> </ul>
<b>Carbohydrate</b>	<ul style="list-style-type: none"> <li>• 45-65% of total kcal/day.</li> <li>• 6-7 servings of grains/day.</li> <li>• Fruits, vegetables, whole grain products and legumes should be the primary sources of carbohydrate and fibre in the diet</li> <li>• Liberalization may be needed to promote variety and increased calorie</li> </ul>

	intake.
<b>Fibre</b>	<ul style="list-style-type: none"> <li>• Minimum weekly average of 21 g of fibre/day provided from a variety of sources</li> <li>• 3.5 servings of whole grains/day.</li> <li>• Fibre fortification of foods should be considered when oral intake of fibre is low.</li> </ul>
<b>Fluid</b>	<ul style="list-style-type: none"> <li>• 1800-2500 mL/day, 1450 mL minimum from meals</li> <li>• Caffeine containing fluids (e.g. regular coffee and tea) up to 5 cups/ day</li> </ul>
<b>Sodium</b>	<ul style="list-style-type: none"> <li>• Aim for 2,300 mg sodium/day</li> <li>• Liberalization up to 5,000 mg sodium per day may be required to increase variety which is expected to promote intake and quality of life for the older adult population.</li> </ul>
<b>Calcium</b>	<ul style="list-style-type: none"> <li>• 1,200mg calcium per day consisting of : <ul style="list-style-type: none"> <li>• 3 cups (250 ml) milk per day to provide approximately 900 mg</li> <li>• An additional 300 mg calcium will be provided in the remaining menu items for the day, including meals and snacks</li> </ul> </li> <li>• Total calcium intake should remain below the level of 2,000 mg/day to avoid possible adverse effects</li> <li>• Calcium supplements may be needed for individuals not meeting their requirements through food, consider elemental calcium when determining intake.</li> </ul>
<b>Vitamin D</b>	<ul style="list-style-type: none"> <li>• A minimum supplementation of 400 IU/day is recommended for all adults over 50 years of age per Health Canada, Eating Well with Canada's Food Guide</li> <li>• Following guidelines for Vitamin D supplement as per WRHA LTC Program of 20,000 IU weekly (ambulatory), discretionary dosage for others, is recommended</li> </ul>

Recommend change in diet name from "LTC Standard" to "Standard/Regular 70+ Years" to reflect that this diet may be appropriate in any setting, not just the long term care setting.

### Practice Changes:

- Continue to follow the guidelines included in "Eating Well with Canada's Food Guide"
- As per Manitoba Health Personal Care Home guidelines, continue to provide between meal snacks particularly for small additional protein sources and fluid sources.
- Increased provision of protein at breakfast (no change in amount provided at lunch and supper).

Note: Recommend movement towards operationalization of protein requirements based on feasibility, menu development, food product enhancement, financial impact and patient/resident acceptance.

### Anticipated Impact:

- Impact on costs associated with increased protein provision at breakfast and more nutrient dense snacks.

- Potential increased protein fortification of breakfast items
- Impact on options provided for between meal snacks, including milk shakes or milk based drinks, full fat yogurts, mousse, ice cream, milk based pudding, fruit cake, cheese, cheese scone, rice pudding custard.
- Provision of appropriate texture modified version of snacks will also increase range of foods available at snack times.
- Continued routine offering of fluids between meals.
- Continued consideration of fortification of foods with nutrients such as calcium may also be of benefit.

**Evidence Review: (Please list type of evidence reviewed or clinical practice guidelines or process for literature search, as applicable.)**

**Meal Pattern and Menu Planning** – Providing menu choices and variety, particularly for therapeutic and texture modified diets, are noted to be critical factors in improving nutritional status and decreasing risk of mortality in the older adult<sup>2,7,8,9,10,11,12,13,14</sup>. To decrease incidence of malnutrition and meet Manitoba Health Standards for Personal Care Homes, successful menu planning must focus on palatable nutrient dense and fortified foods to compensate for decreased intakes/smaller appetites, age related changes/decreases to taste and flavour perception, and higher protein requirements of the older adult<sup>2,7,8,9,10,11,12,13,14,15,16,17</sup>. As older individuals appear to eat a constant volume, not constant energy, providing smaller energy-dense, high protein meals and between-meal snacks may be more appropriate for the older adult to improve intakes and achieve nutritional requirements compared to the traditional distribution (three large meals, two or three small snacks). Snacking regularly can make up to a quarter of daily energy and up to 14% of daily protein consumed. Increasing snack frequency can also increase diet variety and therefore increase carbohydrate, total fat, and daily intakes of vitamins A, C, E, B6, beta carotene, magnesium, copper, potassium, and calcium<sup>2,7,8,10,12,14,15,16,17</sup>. Food service factors that influence the menu planning process and impact the risk of malnutrition should be improved and considered<sup>8,11,12,13,14</sup>. To promote resident-centred menus, these factors include but are not limited to: food fortification for several foods/meals to increase calories without increase in volume (e.g. smaller food packages), increased menu cycle length, and sufficiently trained staff to provide assistance at meal times and/or easy to manipulate cutlery and finger foods<sup>2,8,10,11,12,13,14,15,16,17</sup>.

**Energy** – Current research using the double labelled water technique estimates daily energy needs of adults > 70 years of age at 1800-1900 kcal for females and 2200-2500 kcal for males<sup>18</sup>. This recommended range of calories falls within the mid- to upper requirements identified in Canada's Food Guide of 1750-2000 kcal for females > 70 years and 2200-2500 kcal for males > 70 years<sup>19</sup>. Resting energy requirements in frail elderly adults are estimated at 28 kcal/kg of fat-free mass (FFM) daily, with activity factors of 1.36 in sick older adult and 1.66 in healthy older adults. Energy intake in frail elderly was found to be only 1.23 x Resting Energy Expenditure (REE) and was insufficient to cover energy requirements<sup>20</sup>. The provision of nutrient dense foods at meals and snacks is recommended to meet energy needs.

**Protein** – The Dietary Reference Intakes (DRI) recommends that protein constitute between 10-35% of daily energy intake (Acceptable Macronutrient Distribution Range or AMDR) with emphasis on high bioavailable sources<sup>21,22,23,24</sup>. Evidence shows that older adults need more dietary protein than do younger adults to support good health, promote recovery from illness, and maintain functionality<sup>23,24,25,26</sup>. In addition, older adults need to make up for age-related changes in protein metabolism, such as declining anabolic responses to ingested protein<sup>21,23,26,27</sup>. They also need more protein to offset inflammatory and catabolic conditions associated with chronic and acute diseases that occur commonly with aging<sup>21,24,26</sup>. Of those aged 65-79 years, 65% have 2 or more

chronic diseases; and of those aged 80 years and older, 78% have 2 or more chronic diseases<sup>28</sup>. Recommended protein requirements range from 1.0-1.2 g/kg/d for healthy older adults to 1.2-1.5 g/kg/d for older adults with chronic illnesses<sup>21,22,24,26, 29,30,31,32,33,34</sup>. As many older adults are affected by a combination of chronic diseases, the guideline of 1.2-1.5 g/kg/d is recommended. Utilizing the reference male of 70 kg, the recommendation for protein intake is 84-105 g daily. Daily meals should each include 25-30 g protein to optimize skeletal muscle protein synthesis and reduce the consequences of sarcopenia<sup>21,23,26,29,32,33</sup>. For those individuals who are not consuming sufficient protein, use of the Fortified Standard diet should be considered.

DRI reference Wt.	1.0-1.2 g protein/kg/day (healthy older adult)	1.2-1.5 g protein/kg/day (older adult with chronic disease)
Female – 57 kg	57-68 g pro/day	68-86 g pro/day
Male – 70 kg	70-84 g pro/day	84-105 g pro/day

**Fat** – Fat is a major source of fuel energy for the body and aids in the absorption of fat-soluble vitamins and carotenoids<sup>35</sup>. Neither an adequate intake (AI) nor a Recommended Dietary Allowance (RDA) is set for total fat because there are insufficient data to determine a defined level of fat intake at which risk of inadequacy or prevention of chronic disease occurs<sup>35</sup>. The AMDR is set at 20-35%<sup>35</sup>. While no defined intake level at which potential adverse effects of total fat was identified, the upper end of AMDR is based on decreasing risk of chronic disease and providing adequate intake of other nutrients. The lower end of the AMDR is based on concerns related to the increase in plasma triglyceride concentrations and decreased high-density lipoprotein (HDL) cholesterol concentrations seen with very low fat (and thus high carbohydrate) diets<sup>35</sup>. Fats in general, including saturated fatty acids, play a role in providing desirable texture and palatability to foods used in the diet<sup>35</sup>. As possible with menu planning, utilizing a narrower range, with focus on fat composition at the higher end of the range allows for a higher fat content of the diet to promote palatability and increased energy content without increased volume of food taken. This is noted to be important particularly considering the lower energy intake of this population<sup>36</sup>. Considering the increasing prevalence of obesity in the elderly population, individualization of the diet may be required. In addition to percentage of calories from fat of 20-35%, Dietitians of Canada and the Academy of Nutrition and Dietetics also recommend an increased consumption of n-3 polyunsaturated fatty acids and limited intake of saturated and trans fats<sup>37</sup>. Therefore, foods high in monounsaturated fats and polyunsaturated fats and low in saturated and trans fats are preferred. An aim of 300 mg of cholesterol is recommended however, this may be liberalized where needed to promote variety and increased protein intake<sup>35</sup>.

**Carbohydrate** – The AMDR for carbohydrates for adults 19 years and older is 45-65% of total calories<sup>38</sup>. Fruits, vegetables, whole grain products, and legumes should be the primary sources of carbohydrates and fibre in the diet<sup>39,40</sup>. Grains fortified with vitamin B12 such as cereal should be offered<sup>39</sup>. Dietary sources of added sugar should be limited<sup>39</sup>. To avoid dental caries, it is also important to reduce the amount of time sugars and starches are in the mouth through good oral hygiene practices<sup>41</sup>.

**Fibre** – The AI for males and females over the age of 70 years is 30 g/day and 21 g/day, respectively<sup>42,43</sup>. Fibre should come from a variety of sources to ensure adequate intake of vitamins, minerals, and other nutrients as well as to provide more health benefits including reduction in diarrhea and/or constipation, maintenance of healthy gut bacteria, and enhanced immune system function compared to single fibre sources<sup>39,43,44</sup>. A gradual increase in fibre content should be accompanied by an increase in fluid intake for better tolerance and effect. It is recommended that extra fibre be added slowly to the diet (increasing 5 grams/day per week) to

improve tolerance and minimize gas and bloating<sup>45</sup>. There is insufficient evidence that intakes above the DRI are associated with any further increase in stool weight. Therefore, as a strategy for treating constipation, increasing fibre intake may only be beneficial for people who have low fibre intake<sup>43</sup>. Elderly people who consume proportionally less food might find it difficult to meet their energy requirements if their diets are very high in fibre. Therefore for malnourished individuals, it is not appropriate to consume foods rich in fibre at the expense of energy-rich foods<sup>44</sup>. Oral fibre supplements can be considered if the patient is unable to consume the daily recommended dose of fibre from food<sup>44</sup>.

**Fluid** – The older adult is at risk of dehydration as a result of physiological changes (e.g. reduced thirst sensation, reduced ability of kidneys to concentrate urine, etc) and medical conditions affecting older adults' ability to drink (e.g. dementia, difficulty swallowing, etc). Adequate fluid intake is associated with positive outcomes including reduced falls. Inadequate fluid intake is associated with increased rates of urinary tract infection and contributes to confusion, delirium, and reduced wound healing<sup>46</sup>. Water as a nutrient is particularly important in older adults because of their penchant for rapid shifts in fluid compartments<sup>47</sup>. In spite of its critical importance in health and nutrition, there is less evidence behind fluid requirements than other nutrients<sup>48</sup>. The AI values for water from beverages and foods according to the US Institute of Medicine (IOM) are 2700 mL/day for adult women and 3700 mL/day for adult men<sup>49</sup>. These values were based on median intake estimates among younger adults from NHANES III<sup>50</sup>. It is noted that individuals can be adequately hydrated at lower or higher levels<sup>51</sup>. A minimum intake of 1500 mL daily is proposed for the elderly, however, there is no single recommended daily intake since optimal amounts depend on a variety of factors including weight, health status and energy expenditure<sup>52</sup>. It is suggested that water needs would be best expressed in relation to energy requirements, in part as energy requirements for each age and gender are strongly evidence-based<sup>48</sup>.

Approximately 1 to 2 L/d are required to replace obligatory losses for sedentary adults residing in temperate climates. The IOM clearly documented that maintaining hydration is important, as acute and chronic body water deficits can adversely impact human health and performance<sup>53</sup>.

Considering evidence questioning the AI based requirement for fluid, the typical use of 1 mL/kcal for fluid requirements, and the estimated basic need for fluid of 1- 2 L per day, the awareness of the need for additional fluid during times of high temperature and as the majority of the elderly are sedentary, it is recommended that 1800-2500 mL fluid is provided per day. Grandjean et al.<sup>54</sup> found that caffeinated beverages did not produce significant changes in the hydration status of healthy adult males and conclude that including caffeinated beverages as part of the daily fluid intake is warranted. Intake of caffeine containing beverages, from 3-5 cups daily, should not be restricted as, in spite of the diuretic effects of caffeine, it is not found to compromise hydration status in these volumes and as coffee is one of the most predominant fluids consumed by the elderly<sup>46,51</sup>.

**Sodium** – Healthy adults between 51 and 70 years of age should aim for the Adequate Intake (AI) of 1,300 mg/day without going over the Tolerable Upper Intake Level (UL) of 2,300 mg/day<sup>55,56,57</sup>. Healthy older adults over 70 years of age should aim for the Adequate Intake (AI) of 1,200 mg/day without going over the UL of 2,300 mg/day<sup>55,56,57</sup>.

The World Health Organization (WHO) recommends a reduction in sodium intake to reduce blood pressure and risk of cardiovascular disease, stroke and coronary heart disease in adults<sup>58</sup>. WHO also recommends a reduction to less than 2000 mg/day sodium in adults<sup>58</sup>.

The Dietary Guidelines for Americans recommend that daily sodium intake be reduced to less than 2,300 mg and to further reduce intake to 1,500 mg/day among persons who are 51 years of age and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney diseases<sup>59</sup>.

A 2009 study of 177,025 participants showed that a high sodium intake significantly increased the risk of stroke and cardiovascular disease<sup>60</sup>. High sodium intakes have also been associated with high blood pressure (hypertension), vascular and cardiac damage independent of high blood pressure, detrimental effects on calcium and bone metabolism, increased risk of stomach cancer and increased severity of asthma<sup>56</sup>.

According to Cotungaet al.<sup>61</sup>, "...while much of the data on sodium intake and resulting health problems have supported the intake recommendations, the practicability of the implementation remains in question. Adherence to a low-sodium diet is difficult, even at the 2,300 mg/day level, and this raises questions about the feasibility of a 1,500 mg/day sodium restriction as is being proposed for the new Dietary Guidelines for Americans 2010"<sup>61</sup>.

Previously (2005) the ADA took the position that "Liberalization of the diet prescription improves quality of life for older adults in long term care, continuation of typical sodium content (4 to 6 grams per day) of the diets found in nursing homes is recommended"<sup>62</sup>.

It is noted that up to 5,000 mg sodium per day may be required to promote intake and quality of life for the elderly population as the most recent Position of the Academy of Nutrition and Dietetics states, "The benefits and risks associated with dietary restriction and therapeutic diets for older adults should be considered. Less-restrictive diets that are tailored to each person's needs, desires, and medical conditions can lead to enhanced quality of life and improved nutritional status for older adults living in health care communities"<sup>63</sup>.

**Vitamin D** – The DRI for adults over the age of 70 years is 800 IU/day with a UL of 4000 IU/day<sup>64,65</sup>. The advice contained in Eating Well with Canada's Food Guide recommends that all Canadians over the age of seventy 750 ml of milk or fortified soy beverage daily<sup>65</sup>.

Many Canadians, particularly the older adult population because of poor intake, limited sun exposure and reduced cutaneous production, may not be getting enough Vitamin D<sup>66</sup>. As requirements increase for the older age groups, their needs are more difficult to meet through diet alone and the use of supplements may be required<sup>67</sup>. According to Osteoporosis Canada it is impossible for adults to get sufficient Vitamin D from diet alone as there are very few food sources of Vitamin D<sup>68</sup>. As per Health Canada the need for Vitamin D increases after the age of 50 and in addition to following Canada's Food Guide, everyone over the age of 50 should take a daily Vitamin D supplement of 400 IU/day<sup>64,65</sup>.

Evidence suggests that low Vitamin D has been associated with balance problems, impaired lower extremity functions, high fall rates, low bone mineral density and muscle weakness<sup>69</sup>. Vitamin D supplementation has been shown to reduce the rate of falls in long term care, which can delay the loss of mobility and decline in activities of daily living<sup>69</sup>. Vitamin D supplementation of 20,000 IU/week is recommended for ambulatory (mobile or transferring) residents, discretionary dosage to be used for other residents in LTC<sup>69</sup>.

**Calcium** – The DRI for adults over the age of 70 years is 1,200 mg/day with a UL of 2,000 mg/day<sup>Error! Bookmark not defined.</sup>.

Total calcium intake should remain below the level of the UL to avoid possible adverse effects. Long-term intakes above the UL increase the risk of adverse effects, such as kidney stones<sup>Error! Bookmark not defined.</sup>.

Per Health Canada, at a national level, the prevalence of inadequate calcium intake varies widely,

but tends to increase with age and is higher in women than men<sup>Error! Bookmark not defined.</sup>. Evidence suggests that adequate calcium intake is difficult to achieve from food alone<sup>67,70</sup> and, therefore, additional supplementation may be required to meet the current recommendations.

Calcium supplementation should not exceed 500-600 mg at any one time, and calcium carbonate should be consumed with meals<sup>71</sup>. According the Clinical Practice Guidelines for the Diagnosis and Management of Osteoporosis in Manitoba supplemental calcium should not be taken without concurrent vitamin D supplementation<sup>72</sup>.

**These recommendations have been sent for review by:**

Dr. Donald Duerkson, Medical Director – Nutrition & Food Services	Nutrition & Food Services Management
Linda Norton, Director of Operations, LTC Program	Clinical Nutrition Leadership
Dr. Gilles Pinette, Medical Director, LTC Program	

<sup>1</sup> Dietitians of Canada, Ontario Clinical Nutrition Leaders Action Group. (2014). An Interprofessional Approach to Malnutrition in Hospitalized Adults: Dietitians Leading the Way accessed from <http://www.dietitians.ca/Knowledge-Center/Resources-from-A-Z/Malnutrition.aspx?categoryID=67> December 18, 2014.

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