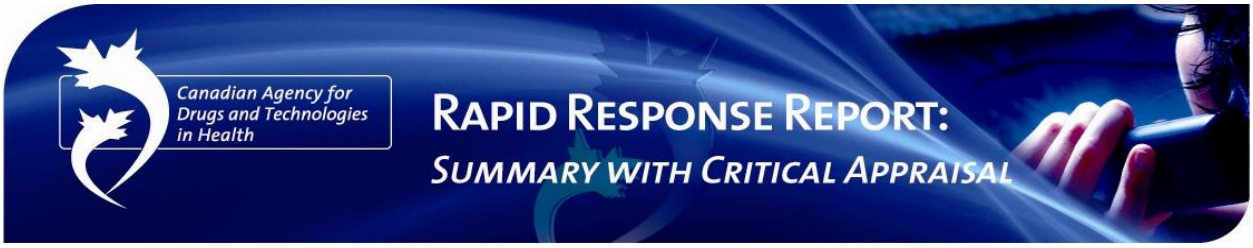


TITLE: Diabetic Diets for Frail Elderly Long-Term Care Residents with Type II Diabetes Mellitus: A Review of Guidelines

DATE: 15 June 2015

CONTEXT AND POLICY ISSUES

People with type 2 diabetes, also known as non-insulin-dependent diabetes or adult onset diabetes, produce less insulin and are often overweight.[1] The prevalence of type 2 diabetes increases with age as more people live longer.[2,3] The prevalence of diabetes among Canadian seniors was 21.3% between 2006 and 2007.[4] In the US, one in three residents of long-term care facilities have diabetes, of which 95% are type 2 diabetes.[1] Older people with diabetes are at an increased risk for urinary tract infections, skin infections, foot ulcers, and pneumonia or flu.[1] Treatment goals vary depending on the overall health of the residents.[1] Usual goals for non-institutionalized adults include HbA1c <7.0%, before meal blood glucose levels 70-130 mg/dl, after meal (2 hours) blood glucose levels <180 mg/dl, blood pressure < 130/80 mmHg, and LDL cholesterol <100 mg/dl.[1] Oral medications or injectable insulin are used to manage high blood sugar, while other agents may be used to control cardiovascular risk factors such as high blood pressure or cholesterol.[2] However, good nutrition plays an important part of diabetes care, since undernutrition is common in frail older people, who often live in the long term care facilities and are dependent on the help of others to perform daily activities due to decreasing in strength, endurance and physiological function, the level of which can be characterized by using a clinical frailty scale.[3,5] It is therefore important to know whether or not dietary restrictions such as "diabetic diets" should be used in such population. "Diabetic diets" are generally healthy diets that are individualized based on preferences, abilities and treatment goals using the advantages and disadvantages of dietary interventions listed in the chapter of Nutrition Therapy[6] of the Canadian Diabetes Association Clinical Practice Guidelines.[7]

The aim of this report is to review the guidelines regarding nutritional management for frail elderly residents in long term care.

RESEARCH QUESTIONS

What are the evidence-based guidelines associated with the provision of diabetic diets for frail elderly long-term care residents with type 2 diabetes mellitus?

KEY FINDINGS

Recommendations based on low quality evidence suggest that regular diets, instead of “diabetic diets”, may be used for elderly nursing home residents with type 2 diabetes. For frail diabetic older people, diets rich in protein and energy may be used to prevent malnutrition.

METHODS

Literature Search Strategy

A limited literature search was conducted on key resources including 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 retrieval to health technology assessments, systematic reviews, meta-analyses and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2010 and May 14, 2015.

Selection Criteria and Methods

One reviewer screened the titles and abstracts of the retrieved publications and evaluated the full-text publications for the final article selection, according to selection criteria presented in Table 1.

Table 1: Selection Criteria

Population	Frail elderly residents with type II diabetes mellitus in long-term care
Intervention	Provision of diabetic diets (nutritional guidelines) for type II diabetes mellitus
Comparator	Diabetic diets No comparator
Outcomes	Guidelines (e.g., quality of life outcomes, patient benefits and harms)
Study Designs	Health technology assessments, systematic reviews, and guidelines

Exclusion Criteria

Studies were excluded if they did not satisfy the selection criteria in Table 1, if they were published prior to 2010, duplicate publications of the same guidelines, non-evidence-based guidelines, or older guidelines from the same guideline society or institute.

Critical Appraisal of Individual Studies

For the critical appraisal of studies, a numeric score was not calculated. Instead, the strengths and limitations of the studies were described narratively.

The Appraisal of Guidelines Research & Evaluation (AGREE II) instrument was used to evaluate the quality of the included guidelines.[8]

SUMMARY OF EVIDENCE

Quantity of Research Available

The literature search yielded 264 citations. Upon screening titles and abstracts, 12 potential relevant articles were retrieved for full-text review. Three additional relevant reports were retrieved from other sources. Of the 15 potentially relevant articles, three reports[9-11] were included in this review presenting guidelines and recommendations for nutrition management for elderly residents with type 2 diabetes. The study selection process is outlined in a PRISMA flowchart (Appendix 1).

Summary of Study Characteristics

Of the three evidence-based guidelines, two were from Canada (the Canadian Diabetes Association [CDA] 2013,[9] the Diabetes Care Program of Nova Scotia and the Palliative and Therapeutic Harmonization [DCPNS/PATH] 2013[10]), and one from Belgium (International Diabetes Federation [IDF] 2013[11]). The CDA guidelines provide recommendations regarding the prevention and management of diabetes, both type 1 and type 2, in all Canadian populations including pregnant women, Aboriginal peoples, children, and the elderly. The guidelines have specific sections entitled “Diabetes in Elderly” and “Nutrition Therapy”. The DCPNS/PATH and IDF guidelines had a narrower scope that specifically focussed on the management of type 2 diabetes in frail older adults.

All guidelines are evidence based and were published in 2013. The methodology of guideline development and evaluation of the science were clearly described in the CDA,[9] but not in the DCPNS/PATH[10] and the IDF[11] guidelines. The strength of the recommendations in the CDA guideline was graded according to the level of evidence in a hierarchical manner where systematic review or meta-analysis of high quality RCTs or appropriate designed RCT with adequate power were ranked highest and expert opinions were ranked lowest. The DCPNS/PATH and the IDF guidelines did not apply the level of evidence to grade the recommendations. Appendix 2 presents the grading of recommendations and levels of evidence of the CDA guideline.

Summary of Critical Appraisal

Strengths and limitations of the included guidelines were assessed using the AGREE II instrument and are presented in Appendix 3.

The CDA guideline[9] met all the items of the six main components of the AGREE II instrument. These include scope and purpose, stakeholder involvement, rigour of development, applicability, clarity of recommendations, and editorial independence.

The DCPNS/PATH[10] and the IDF[11] guidelines did not describe systematic methods to search for evidence, the criteria for selecting the evidence, the strengths and limitations of the body of evidence and the methods of formulating the recommendations. They also had limitations in applicability in terms of facilitators and barriers to their application and potential resource implications. Editorial independence was also not clearly stated in these guidelines. On the other hand, they clearly stated the scope and purpose, stakeholder involvement, and clarity of recommendation.

Summary of Findings

Recommendations on nutrition for frail older adults with type 2 diabetes are presented in Table 2.

The two Canadian guidelines (CDA,[9] and DCPNS/PATH[10]) did not recommend diabetic diets for elderly residents with type 2 diabetes. Regular diets were recommended be used instead. The IDF guideline[11] recommended nutrition with higher protein and energy intake for frail older people with diabetes the prevent malnutrition and weigh loss.

Table 2: Summary of Recommendations

Guideline Society, Country, Author, Year	Recommendations [recommendation grade, and/or level of evidence]
CDA[9] 2013 Canada	*"In elderly nursing home residents, regular diets may be used instead of "diabetic diets" or nutritional formulas"*[9] p.S187 [Grade D, Level 4]
DCPNS/PATH[10] 2013 Canada	*"Dietary management of diabetes in nursing home settings does not appear to meaningfully improve glycemic control and is therefore not needed"*[10] p.805
IDF[11] 2013 Belgium	*"The nutritional assessment should be used to identify the presence of malnutrition and/or weight loss and the appropriate nutritional plan to be adopted.* *Higher protein and higher energy intake foods may be needed to improve nutritional and functional status in frail older people with diabetes."*[11] p.19

CDA = Canadian Diabetes Association; DCPNS = Diabetes Care Program of Nova Scotia; IDF = International Diabetes Federation; PATH = Palliative and Therapeutic Harmonization

Limitations

Few guidelines have recommendations for diets in frail elderly long-term care residents with type 2 diabetes. Of the 13 diabetes guidelines identified, two had recommendations on diets for diabetic elderly living in nursing homes, and one had recommendations for nutritional management of frail older people with diabetes. The recommendation from CDA guideline was of Grade D and based on Level 4 evidence, while those in the other two guidelines were not graded.

CONCLUSIONS AND IMPLICATIONS FOR DECISION OR POLICY MAKING

Evidence-based guidelines for older people with diabetes, especially with nutritional management, are limited. Of the three identified evidence-based guidelines, two were from Canada. Specific "diabetic diets" or dietary management of diabetes were not recommended for older people with type 2 diabetes. Regular diets appear to be sufficient for diabetic elderly nursing home residents. For frail elderly with diabetes, diets rich in protein and energy may be used to prevent malnutrition and weight loss. The recommendations were based on low level evidence that short-term substitution of regular diets for "diabetic diets" did not modify the level of glycemic control. Higher quality evidence from well-designed trials is needed.

PREPARED BY:
Canadian Agency for Drugs and Technologies in Health
Tel: 1-866-898-8439
www.cadth.ca

REFERENCES

1. Diabetes management in long-term care facilities: a practical guide [Internet]. 6th ed. Minneapolis (MN): Diabetes CareWorks; 2014. [cited 2015 May 19]. Available from: http://ltcdiabetesguide.org/wp-content/uploads/2014/03/LTCguide6thEdition1.pdf

2. McCullogh DK, Munshi M. Treatment of type 2 diabetes mellitus in the older patient. 2014 Nov 3 [cited 2015 May 19]. In: UpToDate [Internet]. Waltham (MA): UpToDate; c2005 - . Available from: www.uptodate.com Subscription required.

3. Rizvi AA. Nutritional challenges in the elderly with diabetes. International Journal of Diabetes Mellitus. 2009;1(1):26-31.

4. The health and well-being of Canadian seniors [Internet]. In: The chief public health officer's report on the state of public health in Canada. Ottawa: Public Health Agency of Canada; 2010. Chapter 3 [cited 2015 May 19]. Available from: http://www.phac-aspc.gc.ca/cphorsphc-respcacsp/2010/fr-rc/cphorsphc-respcacsp-06-eng.php.

5. Moorhouse P, Rockwood K. Frailty and its quantitative clinical evaluation. J R Coll Physicians Edinb. 2012;42(4):333-40.

6. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Dworatzek PD, Arcudi K, Gougeon R, Husein N, Sievenpiper JL, et al. Nutrition therapy. Can J Diabetes. 2013 Apr;37 Suppl 1:S45-S55.

7. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Can J Diabetes. 2013 Apr;37 Suppl 1:S1-S216.

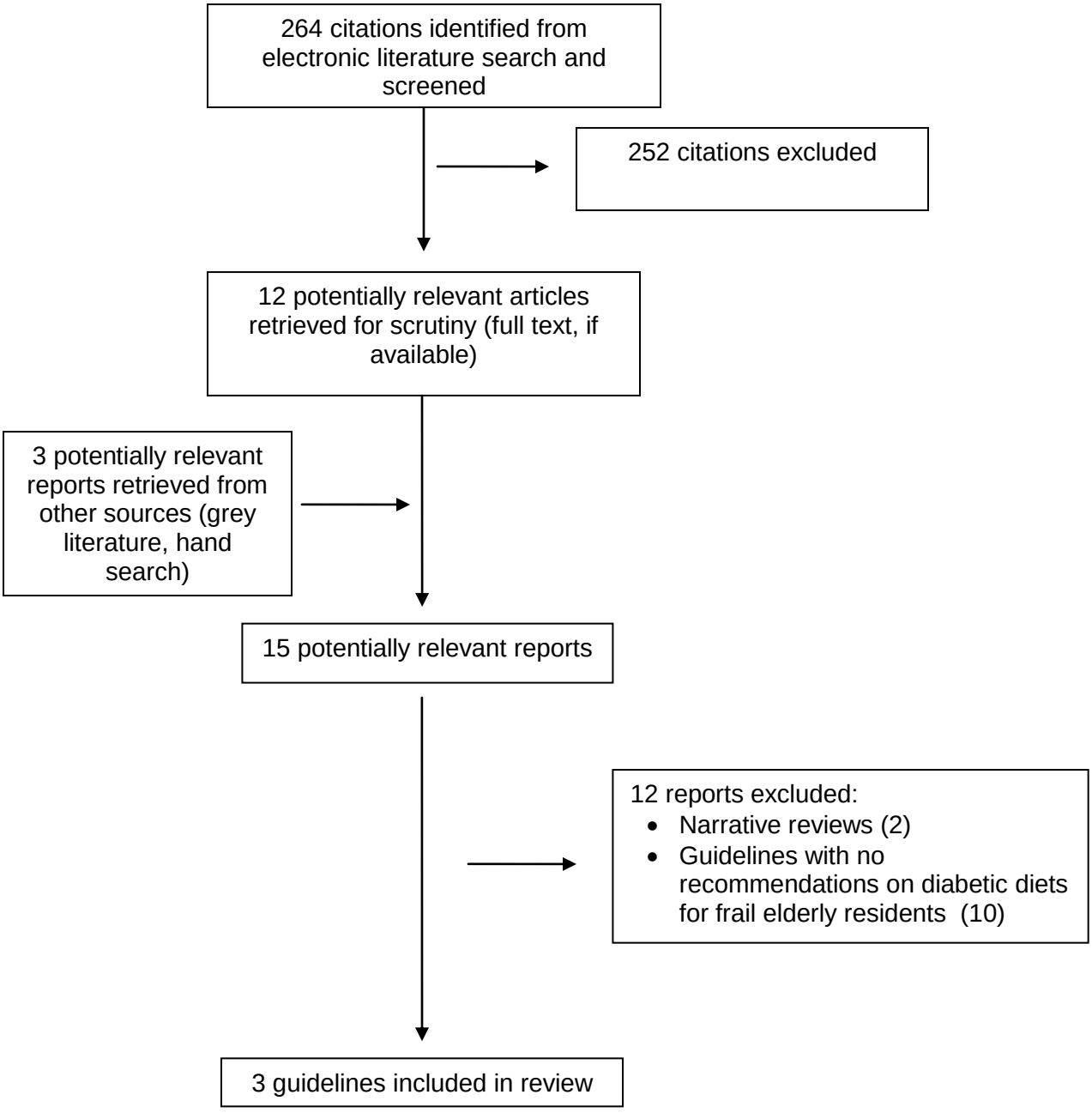
8. Brouwers M, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. AGREE II: advancing guideline development, reporting and evaluation in healthcare. CMAJ [Internet]. 2010 Dec [cited 2014 Apr 9];182(18):E839-E842. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3001530/pdf/182e839.pdf

9. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Meneilly GS, Knip A, Tessier D. Diabetes in the elderly. Can J Diabetes. 2013 Apr;37 Suppl 1:S184-S190.

10. Mallery LH, Ransom T, Steeves B, Cook B, Dunbar P, Moorhouse P. Evidence-informed guidelines for treating frail older adults with type 2 diabetes: from the Diabetes Care Program of Nova Scotia (DCPNS) and the Palliative and Therapeutic Harmonization (PATH) program. J Am Med Dir Assoc. 2013 Nov;14(11):801-8.

11. International Diabetes Federation. Managing older people with type 2 diabetes: global guideline [Internet]. Brussels: IDF; 2013. [cited 2019 May 19]. Available from: http://www.idf.org/sites/default/files/IDF-Guideline-for-older-people-T2D.pdf

APPENDIX 1: Selection of Included Studies



APPENDIX 2: Grading of Recommendations and Levels of Evidence

Guideline Society or Institute, Year, Country	Recommendation Grade	Level of Evidence
CDA[9] 2013 Canada	**A** The best evidence was at Level 1 **B** The best evidence was at Level 2 **C** The best evidence was at Level 3 **D** The best evidence was at Level 4 or consensus	**1A** Systematic overview of meta-analysis of high quality RCTs or appropriate designed RCT with adequate power to answer the question posed by the investigators **1B** Nonrandomized clinical trial or cohort study with indisputable results **2** RCT or systematic review that does not meet Level 1 criteria **3** Nonrandomized clinical trial or cohort study; systematic review or meta-analysis of level 3 studies **4** Other
DCPNS/PATH[10] 2013 Canada	Not applicable	Not applicable
IDF[11] 2013 Belgium	Not applicable	Not applicable

CDA = Canadian Diabetes Association; DCPNS = Diabetes Care Program of Nova Scotia; IDF = International Diabetes Federation; PATH = Palliative and Therapeutic Harmonization; RCT = randomized controlled trial

APPENDIX 3: Summary of the Strengths and Limitations of Guidelines Using AGREE II

Guideline Society or Institute, Year, Country	Strengths	Limitations
CDA[9] 2013 Canada	Scope and purpose • Objectives and target patients population were explicit • The health question covered by the guidelines is specifically described • The population to whom the guidelines is meant to apply is specifically described Stakeholder involvement • The guideline development group includes individuals from all relevant professional groups • The views and preferences of the target population have been sought • The target users of the guideline are clearly defined Rigour of development • Systematic methods were used to search for evidence • The criteria for selecting the evidence are clearly described • The strengths and limitations of the body of evidence are clearly described • The methods of formulating the recommendations are clearly described • The health benefits, side effects, and risks have been considered in formulating the recommendations • There is an explicit link between the recommendations and the supporting evidence • The guideline has been externally reviewed by experts prior to its publication • A procedure for updating the guideline is provided Clarity of recommendation • The recommendations are specific and unambiguous • The different options for management of the condition or health issue are clearly presented • Key recommendations are easily identified Applicability • The guidelines provides advice	No major limitations

Guideline Society or Institute, Year, Country	Strengths	Limitations
	and/or tools on how the recommendations can be put into practice • The guideline describes facilitators and barriers to its application • The potential resource implications of applying the recommendations have been considered • The guideline presents monitoring and/or auditing criteria <u>Editorial independence</u> • The views of the funding body have not influenced the content of the guideline • Competing interests of guideline development group members have been recorded and addressed	
DCPNS/PATH[10] 2013 Canada	<u>Scope and purpose</u> • Objectives and target patients population were explicit • The health question covered by the guidelines is specifically described • The population to whom the guidelines is meant to apply is specifically described <u>Stakeholder involvement</u> • The guideline development group includes individuals from all relevant professional groups • The views and preferences of the target population have been sought • The target users of the guideline are clearly defined <u>Rigour of development</u> • The health benefits, side effects, and risks have been considered in formulating the recommendations • There is an explicit link between the recommendations and the supporting evidence • The guideline has been externally reviewed by experts prior to its publication <u>Clarity of recommendation</u> • The recommendations are specific and unambiguous • The different options for management of the condition or health issue are clearly presented • Key recommendations are easily	<u>Rigour of development</u> • Systematic methods were not used to search for evidence • The criteria for selecting the evidence are not clearly described • The strengths and limitations of the body of evidence are not clearly described • The methods of formulating the recommendations are not clearly described • A procedure for updating the guideline is not provided <u>Applicability</u> • The guideline does not describe facilitators and barriers to its application • The potential resource implications of applying the recommendations have not been considered <u>Editorial independence</u> • It is unclear if the views of the funding body have influenced the content of the guideline • Competing interests of guideline development group members have not been recorded and addressed

Guideline Society or Institute, Year, Country	Strengths	Limitations
	identifiable Applicability • The guidelines provides advice and/or tools on how the recommendations can be put into practice • The guideline presents monitoring and/or auditing criteria are easily identified	
IDF[11] 2013 Belgium	Scope and purpose • Objectives and target patients population were explicit • The health question covered by the guidelines is specifically described • The population to whom the guidelines is meant to apply is specifically described Stakeholder involvement • The guideline development group includes individuals from all relevant professional groups • The views and preferences of the target population have been sought • The target users of the guideline are clearly defined Rigour of development • The health benefits, side effects, and risks have been considered in formulating the recommendations • There is an explicit link between the recommendations and the supporting evidence • The guideline has been externally reviewed by experts prior to its publication • A procedure for updating the guideline is provided Clarity of recommendation • The recommendations are specific and unambiguous • The different options for management of the condition or health issue are clearly presented • Key recommendations are easily identifiable Applicability • The guidelines provides advice and/or tools on how the recommendations can be put into practice	Rigour of development • Systematic methods were not used to search for evidence • The criteria for selecting the evidence are not clearly described • The strengths and limitations of the body of evidence are not clearly described • The methods of formulating the recommendations are not clearly described Applicability • The guideline does not describe facilitators and barriers to its application • The potential resource implications of applying the recommendations have not been considered Editorial independence • It is unclear if the views of the funding body have influenced the content of the guideline • Competing interests of guideline development group members have not been recorded and addressed

Guideline Society or Institute, Year, Country	Strengths	Limitations
	• The guideline presents monitoring and/or auditing criteria are easily identified	

CDA = Canadian Diabetes Association; DCPNS = Diabetes Care Program of Nova Scotia; IDF = International Diabetes Federation; PATH = Palliative and Therapeutic Harmonization