



TITLE: Management of Diabetes in the Long-Term Care Population: A Review of Guidelines

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CONTEXT AND POLICY ISSUES

The economic, social and health burden of diabetes is significant, especially in the elderly population.^{1,2} This is a common disease that affects more than 20% of adults aged 65 to 75 years and 40% of adults older than 80 years.^{1,3,4} The prevalence of diabetes in long-term care (LTC) facilities is similar to that in the general population, but may be underestimated.^{3,5} Previous studies indicated that in a Canadian long-term care facility, a screening program reclassified a third of residents as having diabetes during a three-year period.⁶ Management of diabetes in LTC facilities is challenging due to the under-resourced environment and the nature of this specific population (e.g. age, higher rates of premature death, functional disability, and more co-morbidities than non-diabetics).⁷ Besides lifestyle modification and pharmacological therapy, blood glucose monitoring (levels of blood glucose or HbA1c) is also essential to ensure satisfactory glycemic control. Due to the metabolic differences of diabetes in the elderly compared with younger patients, the approaches of disease management should be different.⁸ The burden of rigorous near normal glycemic control (e.g. cost of patient discomfort) may outweigh the benefits (such as preventing long-term complications) in this population.⁹ Previous clinical practice guidelines have suggested that the glycemic target should be individualized based on the patient's functional status: patients with good functional status should be maintained at HbA1c lower than 7%, whereas those who are frail (have multiple co-morbidities, increased risk of hypoglycemia or have a life expectancy of fewer than 5 years) should be maintained at a less stringent target of lower than 8%.¹

CADTH published a report in 2010 for the purpose of summarizing guideline recommendations regarding the management of diabetes in a long-term care population, but limited evidence was found.¹⁰

The purpose of this review is to identify any evidence and recommendations noted in the evidence-based guidelines for blood glucose monitoring in diabetic patients in LTC setting.

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RESEARCH QUESTION

What are the evidence-based guidelines for the monitoring of blood glucose for patients with diabetes in the long-term care population?

KEY FINDINGS

Recommendations from two evidence-based clinical practice guidelines suggested that laboratory tests be performed when diabetes is suspected. Levels of glucose (fasting blood glucose or HbA1c) are recommended to be tested every 3 to 6 months, however the frequency of the blood glucose monitoring should be individualized.

METHODS

Literature Search Strategy

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2010 and October 29, 2013.

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	Patients with Type 2 diabetes in the long-term care setting, especially the frail elderly population
Intervention	Blood glucose monitoring
Comparator	Not applicable
Outcomes	Evidence-based guidelines for blood glucose monitoring, such as frequency and glycemic goals.
Study Designs	Health technology assessments, systematic reviews, meta-analyses and evidence-based guidelines

Exclusion Criteria

Studies were excluded if they did not meet the selection criteria, were duplicate publications, or if were published prior to 2010 for evidence-based guidelines. The most recent update will be considered the primary publication.

Critical Appraisal of Individual Studies

The “Appraisal of Guidelines Research and Evaluation” (AGREE) instrument¹¹ was used to evaluate the quality of the included guidelines. For the included studies a numeric score was not calculated for quality assessment. Instead, the strengths and limitations of the study were described.

SUMMARY OF EVIDENCE

Quantity of Research Available

A total of 324 articles were identified from the literature search. Upon screening titles and abstracts, six potentially relevant articles were selected for full-text review. Of these, five did not meet the inclusion criteria and were excluded. In addition, one guideline was identified through grey literature search. Thus a total of two evidence-based guidelines were included in this review. No health-technology assessments, systematic reviews or meta-analyses were identified. The selection process is described in Appendix 1.

Summary of Study Characteristics

Two guidelines were included in this Rapid Response report.^{5,12} These evidence-based clinical practice guidelines were published between 2010 and 2011. One guideline was from the Task and Finish Group of Diabetes UK (Diabetes UK),⁵ and one National Guideline Clearinghouse (NGC) summary was based on guidelines from the American Medical Directors Association (AMDA).¹² Both guidelines provided recommendations for blood glucose monitoring for patients with diabetes in long-term care facilities or nursing homes. A summary of guideline characteristics are presented in Table 2.

Table 2: Summary of Guidelines Characteristics

Scope and purpose	Development process
1. Task and Finish Group of Diabetes UK (Diabetes UK), 2011⁵	
<ul style="list-style-type: none"> Guideline To summarize the evidence base of published studies and review documents and other material relevant to adults living within British care home environments and focused on older adults, and embody the views and comments of a multidisciplinary expert panel Target audience: care home staff, visiting health and social care staff, and regulatory bodies 	<ul style="list-style-type: none"> Guideline was developed by a multidisciplinary expert panel composed of members from Diabetes UK, the Royal College of Nursing, the Care Quality Commission, NHS Diabetes, the British Geriatrics Society, the Institute of Diabetes for Older People and from other specialists in the field. Recommendations were based on a review of evidence provided by a systematic review of the medical literature on care home diabetes, and expert opinions.
2. American Medical Directors Association (AMDA), 2010¹²	
<ul style="list-style-type: none"> Guideline To provide evidence-based guidelines focused on diabetes 	<ul style="list-style-type: none"> Guideline was developed by an interdisciplinary workgroup who were experienced in: cardiology, dentistry, endocrinology, family practice, geriatrics, infectious diseases, internal medicine,

Scope and purpose	Development process
management in the LTC setting <ul style="list-style-type: none"> Target audience: health care providers, health personnel, social workers 	nephrology, neurology, nursing, nutrition, ophthalmology, orthopedic surgery, pharmacology, podiatry and preventive medicine <ul style="list-style-type: none"> Recommendations were based on a review of evidence provided by a systematic review of the medical literature, and expert consensus
LTC=long-term care; NHS=National Health Service	

Summary of Critical Appraisal

The two guidelines were developed by working groups that included experts with various expertise.^{5,12} Systematic literature searches were performed to inform both guidelines. A review of clinical trials was used to provide evidence for the Diabetes UK guideline, and review of published meta-analyses and systematic reviews were used to provide evidence for the AMDA guideline. None of the guidelines linked the strength of evidence with the strength of the recommendations. Details on the limitations and strengths of the included guidelines are provided in Table 3. The Diabetes UK guideline was an update of their 1999 report (data from nine new studies were incorporated), while the AMDA guideline was an update of their 2008 report (literature search was updated between June 2009 to October 2010; however the number of new studies was not reported).

Table 3: Critical Appraisal of the Included Guidelines

Strengths	Limitations
1. The Task and Finish Group of Diabetes UK (Diabetes UK), 2011⁵	
<ul style="list-style-type: none"> Scope and purpose of the guidelines clearly described Methods used to search for and select the relevant evidence were described The recommendations were clear, specific and unambiguous Competing interest of development group members was disclosed. 	<ul style="list-style-type: none"> Strength of the evidence was not described Strength of the recommendations was not assessed References were not provided; there were no links between the recommendations and supporting evidence
2. American Medical Directors Association (ASCO), 2010¹²	
<ul style="list-style-type: none"> Scope and purpose of the guidelines and target users clearly described Systematic literature search was performed Strength of the evidence was assessed through expert consensus, judgments were made from study design, study quality, consistency and directness The guideline was validated through external and internal review process Sources of funding were disclosed. 	<ul style="list-style-type: none"> Strength of the recommendations was not assessed References were not provided; there was no link between the recommendations and supporting evidence Some of the recommendations were not clear

Summary of Findings

The Diabetes UK guideline⁵ emphasized the importance of the establishment of a policy of screening for diabetes in LTC facilities, and listed methods and criteria for disease diagnosis. The guidelines stated that the glycemic goals should be individualized. Recommendations were also provided regarding the frequency of blood glucose monitoring: they recommended that the

frequency of blood glucose monitoring should be established on an individual basis, largely based on the treatment of diabetes. In addition, they recommended that HbA1c should be taken every six months, or more frequently for some patients. However, the guideline did not specify the population requiring more frequent HbA1c testing. AMDA¹² recommends that when diabetes is suspected, laboratory tests (fasting or random blood glucose, or oral glucose tolerance test) should be conducted to confirm the diagnosis. In addition, they stated that patients need to be re-assessed 30 days after the initial test. This guideline indicated that a comprehensive monitoring of every patient is inappropriate in the LTC setting. In terms of the frequency of the tests, the guideline suggested a biannual test for patients with pre-diabetes, and a semiannual test for those already on medications for glycemic control. There was no guidance on the testing of HbA1c in the AMDA guideline.

A detailed summary of the recommendations can be found in Appendix 2.

Limitations

There are several limitations associated with the published evidence identified in this clinical review:

Two evidence-based clinical practice guidelines were found to provide recommendations on blood glucose monitoring in the population of interest, published since the previous CADTH review in 2010. One was developed in UK, and the second was developed in the US. Their recommendations were based on evidence from systematic literature search, however the selection criteria were not described in sufficient detail. Strength of evidence was not assessed in one guideline.⁵ Furthermore, no studies were cited for the recommendations in the two guidelines. Both guidelines provided recommendations for patients in LTC settings, but not specifically for frail elderly populations.

CONCLUSIONS AND IMPLICATIONS FOR DECISION OR POLICY MAKING

There are few published evidence-based guidelines for blood glucose monitoring in patients living in long-term care facilities. No health technology assessment reports, systematic reviews, or meta-analyses were located in this review. Recommendations from a British guideline and a US guideline suggested that laboratory tests be performed when diabetes is suspected. Levels of glucose (fasting glucose or HbA1c) were recommended to be tested every 3 to 6 months, however the frequency of the blood glucose monitoring should be established on an individual basis.

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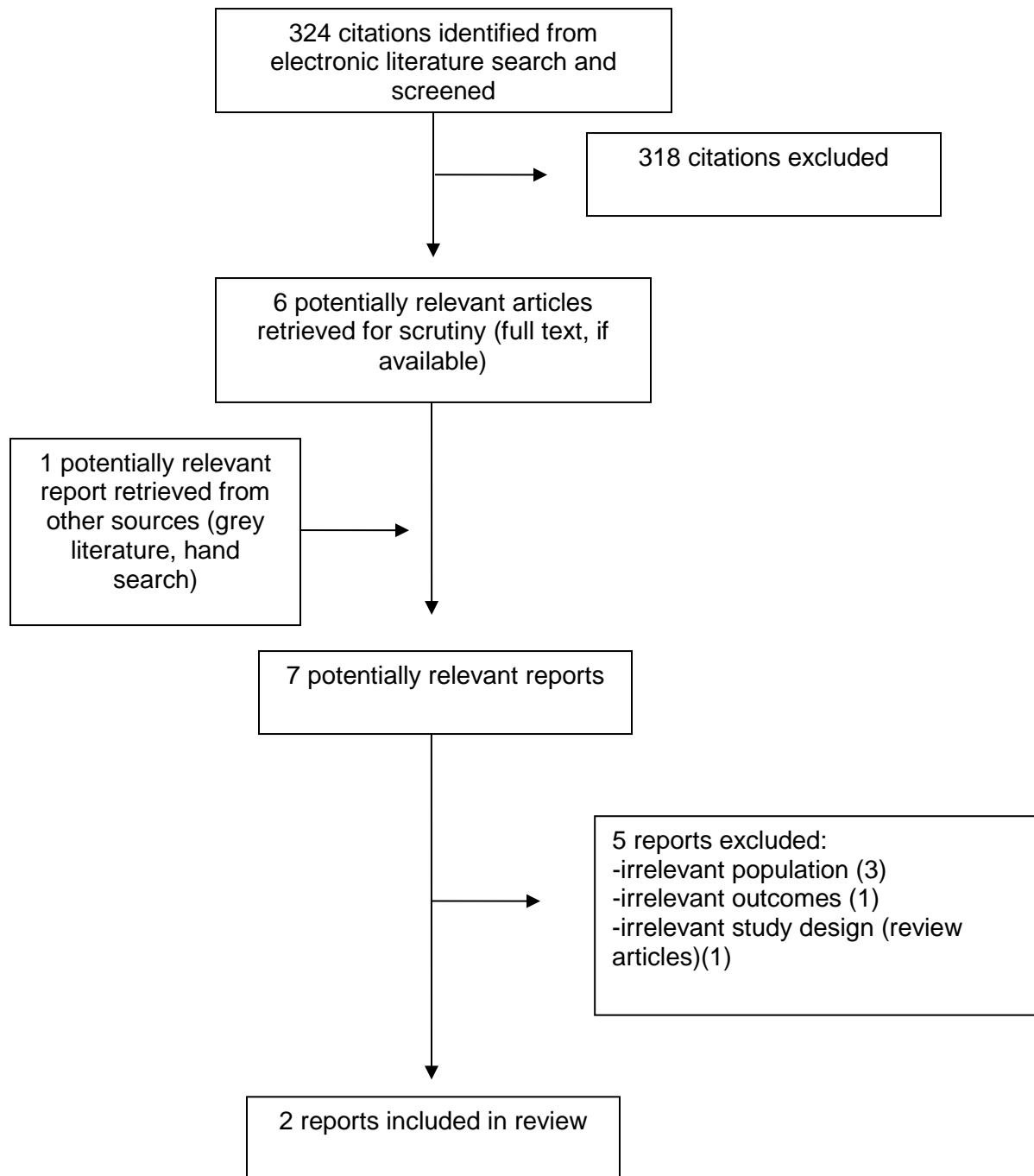
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APPENDIX 1: Selection of Included Studies



APPENDIX 2: Summary of Findings – Guideline Recommendations

Summary of Recommendations	Strength of Evidence
<p>1. The Task and Finish Group of Diabetes UK (Diabetes UK), 2013⁵</p>	
<p>Key to the implementation of the guidelines and form a template for enhanced diabetes care: “The establishment of a policy of screening for diabetes within care homes at admission and at 2-yearly intervals” (pp. 774)</p> <p>Two methods for screening for diabetes within care homes: “1) an HbA1c (no requirement for fasting) combined with a fasting glucose level. An HbA1c of > 6.5% (48 mmol/l) and/or a fasting glucose of ≥ 7.0 mmol/l should be regarded as evidence of diabetes; 2) a fasting glucose estimation and an isolated 2-hour post-meal load. A fasting glucose of ≥ 7.0 mmol/l and/or an isolated 2-hour post-meal load glucose of 11.1 mmol/l should be regarded as evidence of diabetes” (pp. 775)</p> <p>Glycemic goals: “vary with each resident but should be sufficient to avoid recurrent hypoglycemia (a fasting blood glucose level of > 7 - 8.5 mmol/l), a random glucose < 9 mmol/l. A target HbA1c range should be 53-64 mmol/l (7-8%)” (pp. 41 in full guideline⁶)</p> <p>Frequency of blood glucose monitoring: “need to be established on an individual basis, consensus is required between resident, the general practitioner, any community nursing support, and qualified care home staff. It is recommended that HbA1c is taken a minimum of every 6 months, and for many residents 3-monthly HbA1c testing may be of some clinical usefulness.” (pp. 40 in full guideline⁶)</p>	<p>Strength of evidence was not specified for these recommendations</p>
<p>2. American Medical Directors Association (AMDA), 2010¹²</p>	
<p>When it is suspected that a patient has undiagnosed diabetes, laboratory tests (usually include a fasting or random blood glucose test; a 75-g oral glucose tolerance test may be indicated in patient with normal fasting glucose levels but symptoms or signs suggestive of diabetes) should be ordered.</p> <p>Patients need to be re-assessed within 30 days of admission (for new patient) or within 30 days of recognition of diabetes (for established patient). Particular attention should be paid to glycemic control.</p> <p>Comprehensive monitoring of every patient with diabetes is inappropriate in the LTC setting.</p> <p>Patients with pre-diabetes and other risk factors for developing diabetes should have a biannual fasting blood glucose test to screen for diabetes; patients who have begun treatment with any medication known to be associated with hyperglycemia should have fasting blood glucose test every 6 months.</p>	<p>Strength of evidence was not specified for these recommendations</p>