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## Diabetes Mellitus in Older People: Position Statement on behalf of the International Association of Gerontology and Geriatrics (IAGG), the European Diabetes Working Party for Older People (EDWPOP), and the International Task Force of Experts in Diabetes



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### A B S T R A C T

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Diabetes mellitus is a highly prevalent metabolic condition in ageing societies associated with high levels of morbidity, multiple therapies, and functional deterioration that challenges even the best of health care systems to deliver high-quality, individualized care. Most international clinical guidelines have ignored the often-unique issues of frailty, functional limitation, changes in mental health, and increasing dependency that characterize many aged patients with diabetes. A collaborative Expert Group of the IAGG and EDWPOP and an International Task Force have explored the key issues that affect

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diabetes in older people using a robust method comprising a Delphi process and an evidence-based review of the literature. Eight domains of interest were initially agreed and discussed: hypoglycemia, therapy, care home diabetes, influence of comorbidities, glucose targets, family/carer perspectives, diabetes education, and patient safety. A set of “consensus” statements was produced in each domain of interest. These form a foundation for future policy development in this area and should influence the clinical behavior and approach of all health professionals engaged in delivering diabetes care to older people.

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Up to 1 in 5 older people have diabetes, and a similar proportion may have undiagnosed diabetes. This is not a trivial disease and poses many significant challenges to the delivery of effective care.

There is ample proof of the economic, social, and health burden of diabetes in the elderly population. Despite this recognition, diabetes care of older people has been relatively neglected in the medical literature, with few reports of large randomized clinical trials in older patients. In addition, there is little evidence of structured diabetes care in many national diabetes care systems and virtually no specific provision for those who are housebound or living in institutional care.

The effective management of the older patient with diabetes requires an emphasis on safety, diabetes prevention, early treatment for vascular disease, and functional assessment of disability because of limb problems, eye disease, and stroke. Additionally, in older age, prevention and management of other diabetes-related complications and associated conditions, such as cognitive dysfunction, functional dependence, and depression, become a priority.

Various surveys suggest evidence of inequalities in diabetes care owing to variations in clinical practice, particularly in relation to older people. This may be manifest as lack of access to services and inadequate specialist provision that lead to poorer clinical outcomes and patient and family dissatisfaction.

Patient safety is an a priori issue for managing older people with diabetes but is often compromised by inappropriate treatment choice, suboptimal specialist follow-up, and patient-centered issues, such as the development of cognitive dysfunction or depressive illness. Both of these conditions are more common in older people and may in fact be directly associated with the presence of diabetes. Depression is often not recognized and inadequately treated. Social isolation may be a feature of many older people with diabetes, particularly if they have few relatives or have mental health problems, and providing a well-supported social network is important.

We recognize there is confusion within health care organizations and their providers on what the terms “elderly” or “older” actually represent. We have taken a “global” perspective in this Position Statement, and, as we are attempting to address issues in more vulnerable older patients, we have limited our scope to those 70 years and older.

We also understand that older people are not a homogeneous group of individuals, but have varying levels of cognitive and functional ability and an often complex set of health and social care needs depending on the state of development of national health care services and a patient's access to them. Although an older person with diabetes has a high likelihood of being well and enjoying a good quality of life, many are functionally dependent or have evidence of cognitive problems, which alters goals of care and influences management strategies. This Position Statement attempts to embody these aspects in the conclusions and statements given.

We feel that it is timely to establish a collaborative initiative between key international diabetes and gerontological organizations to enhance diabetes care for older people worldwide. This Position

Statement represents the first stage in developing such a global initiative. It was produced to influence the clinical behavior and approach of all health professionals engaged in delivering diabetes care to older people.

### Background Aims

Following a round table discussion by key participants at the European Association of for the Study of Diabetes in Rome in September 2008, we identified a list of priorities and developed a concerted action plan for enhancing diabetes care in older people. This Position Statement on diabetes in older people is designed to give an overview of the present state of diabetes care of this group of people. In addition, the statement will outline a consensus view on the perceived priorities for improving diabetes care and achieving the best possible clinical outcomes during the next decade. Diabetologists from around the globe and both the International Association of Gerontology and Geriatrics and the European Diabetes Working Party have been involved in developing this work.

Purpose of the Position Statement:

- (1) Arrive at a consensus on how we approach the management of key issues of diabetes care for older people.
- (2) Identify a series of key areas for diabetes-related surveys and/or audits of clinical care within a range of countries. These may take the form of surveys of particular drug usage, mortality and comorbidity rates, models of care, and use of clinical guidelines in clinical decision making.
- (3) Recommend up to 3 to 4 research areas that could be considered for further investigation using selected research tools, and that could form the basis of one or more collaborative research proposals.

### Methodology and Preparation for Consensus Roundtable

An expert roundtable was organized in June 2010 in Frankfurt as an opportunity to critically discuss and evaluate views and experience of some of the complex issues of diabetes in old people. This group communication process was complemented by 2 audio teleconferences with other global experts in the field. An audio record of all discussions was made to assist the moderator (A.S.) to produce a draft report of the proceedings.

An important purpose was to arrive at a consensus on how we approach the management of significant issues including those that require further study (see Figure 1). We agreed that by defining at least 2 recommendations per domain based on this process we would have a workable set of conclusions on which to base the Position Statement. Discussants participated in a brief Delphi process, combined with a traditional evidenced-based approach (see Appendix A at [www.jamda.com](http://www.jamda.com)), which aimed to address the main areas from several perspectives. We chose 4 perspectives for each of the domains of interest (to provide an initial structure) but participants in the roundtable discussion had the opportunity to

define other perspectives that needed to be considered. Throughout the whole process, each participant was able to contribute a perspective or comment at any stage.

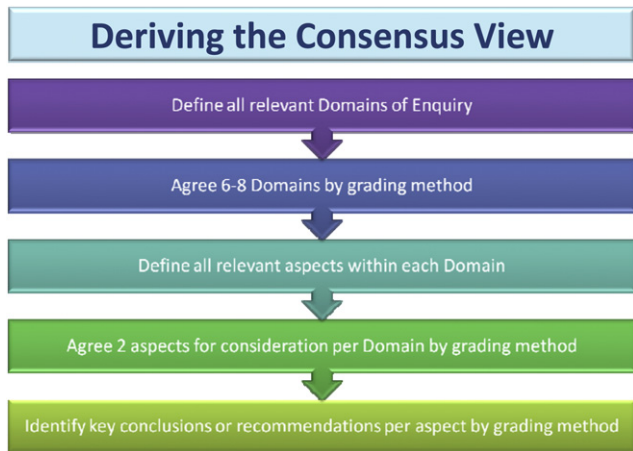


Fig. 1. Post consensus meeting tasks to include evidence-based review as appropriate.

The 4 perspectives were:

- (1) Recognizing and Defining the Problem
- (2) Determining the Strategy for Solving the Problem
- (3) Defining the Criteria That Tests the Solutions
- (4) Evaluating the Solutions in Clinical Practice

Eight domains of interest were initially agreed and discussed: hypoglycemia, therapy, care home diabetes, in ities, glucose targets, family/carer perspectives, diabetes education, and patient safety. For those participants joining for the teleconference only, a brief summary of each domain was prepared by the moderator and each participant was given an opportunity to contribute further.

We partly addressed the judgmental issue by asking participants to rank their level of agreement with each of the 4 perspectives according to the following scale (which was discussed and agreed in advance):

|                       |
|-----------------------|
| Strongly agree = 6    |
| Agree = 5             |
| Mildly agree = 4      |
| Mildly disagree = 3   |
| Disagree = 2          |
| Strongly disagree = 1 |

The definitions of each grading scale are given in Appendix B.

The moderator used a “voting” system when final comments and solutions were being offered so as to reach consensus. After the conference weekend, the moderator produced a draft report and provided all participants with a chance to make further contributions. These were received, tabulated, and redistributed to members, and a second roundtable and international teleconference was held in Oxford, UK, in January 2011. A final consensus was then agreed.

### Ranking the Domains of Enquiry

At the start of the roundtable, participants ranked the order of importance of the domains. For this part only, we show the influence

**Table 1**  
Overall Ranking Domains through 1st and 2nd Stage Processes

| Domain                      | Ranking—1 <sup>st</sup> stage* | Ranking—2 <sup>nd</sup> stage** |
|-----------------------------|--------------------------------|---------------------------------|
| Hypoglycemia                | 5                              | 3                               |
| Therapy                     | 7                              | 5                               |
| Care home diabetes          | 8                              | 5                               |
| Influence of co-morbidities | 1                              | 2                               |
| Glucose targets             | 3                              | 1                               |
| Family/carer perspectives   | 4                              | 8                               |
| Diabetes education          | 2                              | 5                               |
| Patient safety              | 5                              | 3                               |
| Nutrition***                |                                |                                 |
| Hypertension***             |                                |                                 |

Grade 1, highest; Grade 8, lowest.

\*After Roundtable Discussion only.

\*\*After participation of teleconference experts.

\*\*\*Additional domains suggested by several participants but not graded highly enough to be included within the eight chosen.

of global experts in modifying the emphasis of the ranking grades. The overall ranking is shown in Table 1.

### Consensus Statements According to Each Domain

#### Assessment of Domains – In Order of Final Ranking

Each domain was discussed in detail during the moderated discussions (available on request). The following statements were agreed by consensus and a comment given in each case. These statements pertain to patients 70 years and older.

#### Glucose Targets

##### Consensus statements

- (1) The clinician must consider individual comorbidities, and cognitive and functional status when determining what glucose goals should be agreed with the patient and/or carer.
- (2) In general, on treatment, an HbA1c target range of 53 to 59 mmol/mol (HbA1c 7.0%–7.5 %) should be aimed for.
- (3) To reduce the risk of hypoglycemia, no patient should have a fasting glucose on treatment of less than 6.0 mmol/L: “Not below 6.”
- (4) No patient should commence glucose-lowering therapy with drugs until the fasting glucose level is consistently 7 mmol/L or higher: “Not before 7.”
- (5) Low blood glucose states (levels of glucose of <5.0 mmol/L) should be strictly avoided.
- (6) A random glucose level higher than 11.0 mmol/L should be avoided to minimize symptoms and reduce the risk of other diabetes-related complications.

*These values are a guide to treatment and in cases of functional dependence, care home residency, dementia, end-of-life care, and other high dependency states, they may need adjusting to reduce the risk of hypoglycemia and to enhance patient safety.*

#### Influence of Comorbidities

##### Consensus statements

- (1) Because of the high risk of associated comorbidities in older people with diabetes, we recommend that regular CGA

(Comprehensive Geriatric Assessment) is used to identify related functional loss and the impact of disability.

- (2) Older people with diabetes may have varying levels of nutritional impairment that may influence and modify the impact of other comorbidities: a *nutritional screening assessment tool should be used routinely*.
- (3) In patients with hypertension, the blood pressure threshold for treatment is 140/80 mm Hg, and 150/90 mm Hg in those subjects 75 years and older; a lower systolic blood pressure threshold may be appropriate in those with evidence of renal impairment (estimated glomerular filtration rate [eGFR] <60 mL/min/1.73 m<sup>2</sup>).
- (4) An acceptable blood pressure target in functionally dependent patients with diabetes is below 150/90 mm Hg.
- (5) Screening for renal impairment in all newly diagnosed patients with diabetes should be carried out; annual testing of the eGFR is recommended.

### Patient Safety

#### Consensus statements

- (1) Increasing age and progressive functional loss pose significant risks for patient safety.
- (2) The close relationship between diabetes and impaired functional status requires all patients to have an assessment of both physical and cognitive function using the CGA, so as to maximize independence, self-management ability, and safe adherence to therapy.
- (3) Regular screening for mood disorder, cognitive impairment, and hearing and visual loss (annually as a minimum) is necessary to enhance patient safety and alert the physician to the need for additional supportive care.
- (4) Avoid polypharmacy and use simplified (once-daily where possible) treatment regimens to achieve acceptable glucose targets; depending on diabetes control and what other comorbidities are present, the priority list of medications should include a statin, an angiotensin-converting enzyme inhibitor, and a glucose-lowering agent.

Delayed treatment and undertreatment are also important considerations.

### Hypoglycemia

Hypoglycemia is defined for the purpose of this statement as a blood glucose level less than 4 mmol/L.

#### Consensus statements

- (1) In older people, hypoglycemia is a highly prevalent and underrecognized disorder with severe consequences (eg, falls, cognitive impairment, hospital admission, and so forth).
- (2) Older people with diabetes on a longer-acting sulphonylurea or an intensive insulin regimen are at high risk of hypoglycemia: risk is increased in those with polypharmacy, cognitive impairment, malnourishment, and those recently discharged from hospital or residing in a care home.
- (3) A focused education strategy needs to be used and implemented for both patients and carers to decrease the risk of hypoglycemia.
- (4) Hospital admission for hypoglycemia should trigger the need for diabetes specialist review.

### Therapy

#### Consensus statements

- (1) All patients should participate as actively as possible in a tailored physical activity program involving resistance training, balance exercises, and cardiovascular fitness training.
- (2) In view of their limited benefits, restrictive diets should be avoided in those patients 70 years and older, and in those with undernutrition.
- (3) Metformin can be considered as first-line glucose-lowering therapy in older people with type 2 diabetes, and as an adjunct to insulin therapy in those recommended for combination therapy.
- (4) In those patients at higher risk of hypoglycemia, sulphonylurea therapy should be avoided.
- (5) In selected patients, a basal insulin regimen may be safer in terms of hypoglycemia risk than a basal/bolus or premixed insulin regimen.
- (6) In selected older patients not in target or where there is poor tolerance to the glucose-lowering agents, the use of a dipeptidyl peptidase 4 (DPP4) inhibitor can be considered as second-line therapy.
- (7) In subjects who are obese (body mass index [BMI] >35), or where there is poor tolerance or lack of response to other agents, a glucagonlike peptide 1 agonist can be considered as both second-line and third-line therapy.
- (8) In selected patients *not at high risk of heart failure* or of bone loss or a previous diagnosis of osteoporosis, who have no history of bladder cancer, treatment with pioglitazone can be considered as second-line therapy after metformin.

### Diabetes in Care Homes

#### Consensus statements

- (1) Diabetes care policies for care homes are recommended but the focus of treatment should be individualized for each resident.
- (2) The major aims of caring for residents with diabetes are (1) prevent hypoglycemia, (2) avoid acute metabolic complications, (3) decrease the risk of infection, (4) prevent hospitalization, and (5) introduce timely end-of-life care and Advanced Care Directives. There should be a specific “individualized” diabetes care plan for each resident with diabetes and this requires regular review.
- (3) A regulatory framework needs to be in place to ensure that care homes provide access to a diabetes educational course for staff so as to maintain clinical and social care standards that are aligned to the health and social care needs of each resident.
- (4) All stakeholders need to be aware that residents with diabetes have a high prevalence of pressure ulcers of the lower extremity, infection, and pain and these need timely recognition and management.

### Diabetes Education

#### Consensus statements

- (1) Diabetes educational approaches should be aligned with the cognitive and functional status of older people and may require

individualized materials (apart from group work) and educational support for carers.

- (2) Diabetes education should address the ability of patients (and/or carers) to manage medication including insulin therapy.
- (3) All patients and their carers should receive educational advice about minimizing hypoglycemia and avoiding hospital admission.
- (4) Impairment in cognitive function (which in itself may be a complication of diabetes) may impede self-care capacity of older individuals with diabetes.
- (5) Enhancing access (communication, wheelchair compatible, transport) to local available educational programs should be emphasized where possible.
- (6) Every health care episode (contact) with older people with diabetes should be viewed as an opportunity to educate both the patient and family member (or carer). This should include review of self-management skills, metabolic targets, avoidance of hypoglycemia, “sick-day” rules, and nutrition.
- (7) Media campaigns to highlight the special requirements and needs of older people with diabetes should be promoted.

#### Family/Carer Perspectives

##### Consensus statements

- (1) Education and support for caregivers should help to keep older functionally dependent or disabled people with diabetes at home and may be associated with reduced health and social care costs.
- (2) There needs to be greater recognition of the important roles of family and nonprofessional caregivers in managing older people with diabetes.
- (3) There needs to be greater recognition of the impact of caring on caregivers in terms of their own unrecognized health and social care needs.
- (4) Identified family members and other nonprofessional people responsible for providing care require an assessment of their abilities and skills to provide safe and effective diabetes care.

#### Conclusions

This is the first comprehensive expert-based review of the available evidence for the management of diabetes in older people in which recommendations are developed through a precise methodological procedure complemented by consideration of the medical literature.

The roundtable discussion and international teleconference has established a number of key survey areas that should be developed, and these are summarized as follows:

- (1) Defining the most appropriate pattern of first-line and second-line therapy in type 2 diabetes for older people, and the role of DPP4-inhibitors and incretin therapies
- (2) The prevailing model of diabetes care (eg, mainly primary care or specialist-based, and so forth)
- (3) Hospitalization rates from both domestic and care home-based settings
- (4) Patterns of disability, rates of cognitive dysfunction and disability among older individuals with diabetes.

This consensus has also provided information on the major research areas within diabetes of old age that need to be addressed. These are summarized in priority order as follows:

- (1) The use of exercise-, nutrition-, and glucose-lowering therapies in the effective management of type 2 diabetes in older people
- (2) Practical community-based interventions to reduce hospitalization
- (3) Methods to decrease hypoglycemia rates in various clinical settings
- (4) Health economic evaluations of metabolic treatment
- (5) Interventions to delay/prevent diabetes-related complications that are important in older age, such as cognitive impairment and functional dependence
- (6) Development of technical devices that help to maintain autonomy and safety for older people with diabetes

Finally, 4 key conclusions emerge from this work and can be summarized as follows:

- (1) Using a Delphi-based method, we were able to identify a series of statements and recommendations in important key areas of diabetes management of older people.
- (2) Although experts in geriatric diabetes have a major focus on the effects of diabetes on functional status and well-being, our group of experts have clearly identified glucose targets as a fundamental issue to be addressed.
- (3) This consensus statement also highlights other key areas of significant impact in older people such as hypoglycemia, diabetes-related complications that become a priority in older age (cognitive impairment and functional dependency), therapeutic issues, the challenges of care home diabetes, and the importance of diabetes education.
- (4) To make progress in this often-neglected area, we require this Position Statement to lay the foundation of enhanced care for older people with diabetes on a worldwide scale.

We anticipate that the next step in this international collaborative work will be to organize a multicenter clinical audit of diabetes care within countries in all the continents.

#### Dedication

This Position Statement is dedicated to the memory of Dr Ulrich Vischer (deceased March 19, 2012, aged 54 years), a member of the Consensus Group and a marvelous physician.

#### Acknowledgments

We acknowledge the support and encouragement of the International Association of Geriatrics and Gerontology, and the European Diabetes Working Party for Older People.

#### Supplementary Data

Supplementary data related to this article can be found online at [10.1016/j.jamda.2012.04.012](http://dx.doi.org/10.1016/j.jamda.2012.04.012)

## Appendix B

### Definitions of Grading Scales

#### **Strongly agree = 6**

You believe that the evidence for making this statement is very robust and agrees entirely with your clinical experience.

#### **Agree = 5**

Your analysis of the evidence combined with your clinical experience is sufficient for you to accept this grading for the conclusion/statement in question.

#### **Mildly agree = 4**

When you have considered all the information at your disposal, combined with your own views and experience, this is the most likely fair grade to adopt.

#### **Mildly disagree = 3**

When you have considered all the information at your disposal, combined with your own views and experience, it is your impression that you are not able to accept this conclusion.

#### **Disagree = 2**

Your analysis of the evidence combined with your clinical experience is sufficient for you to reject this conclusion.

#### **Strongly disagree = 1**

You believe that the evidence for making this statement is very weak and does not agree at all with your clinical experience.