



## Complete Summary

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### GUIDELINE TITLE

Diabetes mellitus. Nutrition management for older adults.

### BIBLIOGRAPHIC SOURCE(S)

White JV. Diabetes mellitus. Nutrition management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 14 p. [22 references]

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

Diabetes mellitus (type I and type II)

### GUIDELINE CATEGORY

Counseling  
Evaluation  
Management  
Prevention  
Screening  
Treatment

### CLINICAL SPECIALTY

Endocrinology  
Family Practice  
Geriatrics  
Internal Medicine  
Nutrition  
Preventive Medicine

## INTENDED USERS

Advanced Practice Nurses  
Dietitians  
Health Care Providers  
Nurses  
Patients  
Physician Assistants  
Physicians

## GUIDELINE OBJECTIVE(S)

To provide nutrition screening and intervention strategies for diabetes mellitus (DM) that will enhance disease management and health care outcomes and that will positively impact individual health and quality of life of older adults

## TARGET POPULATION

Older adults with diabetes mellitus (DM) type 1 or type 2; or impaired glucose tolerance or impaired fasting glucose which may progress to DM

Excluded are individuals with diabetes insipidus, diseases of the exocrine pancreas, endocrinopathies, and other subclasses of DM (i.e., gestational diabetes [GDM], secondary causes of diabetes, and other types of DM conditions or symptoms).

## INTERVENTIONS AND PRACTICES CONSIDERED

### Nutrition Screening for Diabetes Mellitus (DM)

1. Measurement of plasma glucose
2. Measurement of glycosylated hemoglobin (HbA1c)
3. Measurement of fructosamine
4. Measurement of body weight
5. Measurement of height
6. Measurement of blood pressure
7. Evaluation of caloric intake
8. Evaluation of urine for microalbuminuria
9. Evaluation of activity level
10. Evaluation of medications use

### Nutrition Interventions

1. Weight loss if overweight
2. Reduction of dietary saturated fat and cholesterol and total fat intake
3. Reduction of sodium
4. Increased dietary fiber
5. Following an appropriate meal plan
6. Elimination or limitation of alcohol intake
7. Smoking cessation

8. Exercising appropriately(including aerobic exercise, use of proper footwear, foot inspection after exercise, and monitoring blood glucose)

#### MAJOR OUTCOMES CONSIDERED

- Impact of nutritional status on diabetes mellitus
- Adverse health outcomes associated with uncontrolled or poorly controlled diabetes
- Impact of diabetes on health services utilization and costs
- Benefits and risks of nutrition management in patients with diabetes

## METHODOLOGY

#### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

#### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

#### NUMBER OF SOURCE DOCUMENTS

Not stated

#### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

#### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

#### METHODS USED TO ANALYZE THE EVIDENCE

Review

#### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

#### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Informal Consensus

#### DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Professionals with expertise in nutrition, medicine, and allied disciplines served as authors and reviewers.

The information in A Physician's Guide to Nutrition in Chronic Disease Management for Older Adults-Expanded Version is derived from The Role of Nutrition in Chronic Disease Care, a 1997 Nutrition Screening Initiative (NSI) publication. The authors updated their 1997 work through an extensive review of the literature, using evidence-based data where possible and consensus-based information when definitive outcomes were not available.

#### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

#### COST ANALYSIS

Patients with diabetes mellitus (DM) who were hospitalized and who received consultation by a multidisciplinary diabetes team (endocrinologist, nurse educator and registered dietitian [RD]) had lengths of stay (LOS) 56% shorter than those receiving no consultation (3.6 vs. 8.2 days) and 35% shorter than patients who received consultation by the endocrinologist alone (3.6 vs. 5.5 days). Each 1-day delay in consultation resulted in a 1-day increase in lengths of stay.

In 1992, it was estimated that people with DM made an estimated 1 million visits to dietitian or nutritionist. Outpatient costs were estimated to be approximately \$31.9 million or approximately \$31.00/visit; 0.03% of all expenditures were for diabetes care. Outpatient nutrition education (an average of 4.6 visits over a period of 6 months) improved clinical outcomes in persons with type 2 DM: 76% had a 50% decrease in blood glucose levels; 44% were able to discontinue oral hypoglycemic medications; an average weight loss of 2 kg (~5 lbs) was maintained.

One group of researchers reported significant improvements in medical and clinical outcomes of people with type 2 DM when medical nutrition therapy (implementation of practice guidelines for nutritional care) was provided. Patients experienced a mean decline in fasting plasma glucose levels of 10.5%. At 6 months, 46% of patients had achieved or maintained a target total cholesterol outcome, 60% a target low-density lipoprotein (LDL) outcome, and 53% a target triglyceride outcome. At 6 months, the mean weight loss for the intervention group was 1.6 kg (approximately 4 lbs.), with 22% of patients losing >4.5 kg (approximately 11 lbs). When net costs were considered, the cost effectiveness ratio for this type of intervention was \$4.20.

Patients receiving basic nutrition education also provided by a registered dietitian experienced significant health benefits and cost savings when compared to the control group who received no nutrition intervention. For the basic care group, the cost effectiveness ratio for basic nutritional care was \$5.32.

#### METHOD OF GUIDELINE VALIDATION

External Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

An interdisciplinary advisory committee of nationally recognized practitioners in medicine, nutrition, and geriatrics reviewed the chapter related to their area of expertise.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

#### Nutrition Screening Guidelines for Diabetes Mellitus (DM)

At a minimum, nutrition screening of risk factors for DM should include the following:

- Measurement of plasma glucose levels in individuals at risk for having DM or for developing it, in individuals presenting the classic signs/symptoms of DM, and in individuals presenting with the possible complications of DM (e.g., cardiovascular disease (CVD), cerebrovascular disease or stroke (CVA), peripheral vascular disease (PVD), hypertension (HTN), dyslipidemias)
- Measurement of glycosylated hemoglobin (HbA1c) every 3 to 6 months
- Measurement of body weight at each office visit
- Measurement of height annually
- Measurement of blood pressure
- Evaluation of caloric intake if significant over/underweight is present
- Evaluation of urine for microalbuminuria
- Evaluation of activity level
- Evaluation of medications use

The use of the Nutrition Screening Initiative's (NSI) Checklist and Screens (see appendices of the original guideline document) provides a mechanism to address the majority of elements listed above. The Level II Screen can be an invaluable starting point in the further identification and treatment of nutritional risk factors associated with DM.

#### Nutrition Intervention Guidelines for Diabetes Mellitus

Nutrition intervention in DM should consist of one or more of the following:

- Lose weight if overweight. A weight loss of as little as 2 to 4.5 kg (5 to 10 lb.) can significantly improve glycemic control in persons who are overweight. These are usually individuals with type 2 DM.
- Reduce dietary saturated fat and cholesterol for overall cardiovascular health. Reducing total fat intake also helps to reduce caloric intake, which is important in weight control and the management of type 2 DM and other disease states that increase the risk of coronary heart disease. Consistent with the recommendations listed in the Third Report of the National Cholesterol Education Program (NCEP), total fat intake should be <30% and saturated fat (saturated fat includes fats that are solid at room temperature [i.e., solid vegetable shortening, milk fat in whole milk and cheeses, poultry skin, and animal fats]) should be <10% of total daily calories. Cholesterol

intake should be <300 mg/d. However, as consistent data becomes available regarding the interrelationship of genotype, diet, and plasma lipid response, nutrition recommendations for specific genotypes may emerge that are very different from the general dietary guidelines being prescribed currently.

- Reduce sodium intake if hypertensive to less than 100 mmole/day (<2.3 g sodium or approximately 6 g sodium chloride [1 tsp salt]). A reduction to this level of salt intake in persons with hypertension, especially in those who are elderly or black, helps to attenuate the rise in systolic blood pressure associated with age, lower systolic blood pressure and diastolic blood pressure in many with established hypertension, and decrease or eliminate the need for medication.
- Increase dietary fiber intake from a wide variety of food sources to the amount recommended for the general population (20 to 35 g dietary fiber/day).
- Follow a meal plan based on the individual's usual food intake and preferences with a carbohydrate, protein, and fat content formulated to meet disease-specific indications and based on treatment goals. This is especially important in people with type 1 DM.
- Eliminate or limit alcohol intake to <1 oz/day of ethanol (24 oz of beer, 8 oz of wine, or 2 oz of 100-proof distilled spirits). The US Dietary Guidelines for Americans state that alcoholic beverage intakes for women should be less than half of that listed in this recommendation.
- Stop smoking.
- Exercise appropriately. Include aerobic exercise 20 to 45 minutes at least 3 days/week. Include low intensity warm-up and cool-down exercises. Use proper footwear and, if appropriate, other protective equipment. Inspect feet daily after exercise. Avoid exercise during periods of poor metabolic control. Monitor blood sugars and eat appropriately to prevent hypoglycemia.

In individuals with impaired glucose tolerance or impaired fasting glucose, the lifestyle modifications mentioned above should be initiated as soon as problem conditions or behaviors are recognized, even in the absence of frank DM. A similar strategy may be appropriate for minority populations since the propensity of minorities to develop type 2 DM is greater than it is in whites.

In individuals in whom DM has occurred, lifestyle modifications may be used as definitive or adjunctive therapy at the discretion of the primary care provider. They improve the general risk profile for DM, offer multiple benefits at low cost, and carry minimal risk of adverse effects.

#### CLINICAL ALGORITHM(S)

None provided

### EVIDENCE SUPPORTING THE RECOMMENDATIONS

#### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

The benefits of normalization of blood sugar in people with diabetes mellitus (DM) are significant. In individuals with DM, intensive therapy and improved glucose control reduces the risk of development or progression of diabetic neuropathy, retinopathy, and nephropathy by up to 50 to 70%. The reduction in risk of these complications correlated continuously with the improvement in blood sugar levels. The complete normalization of blood sugar may prevent complications.

### POTENTIAL HARMS

With complete normalization of blood sugar comes the increased risk of recurrent, unrecognized, and possibly severe hypoglycemia in persons taking insulin and to a lesser extent in those using oral hypoglycemic agents.

Individual treatment goals must take into consideration the patient's ability to understand and to carry out the treatment regimen, the patient's risk for the development of severe hypoglycemia, and other factors unique to the patient that may increase risk or decrease benefit (e.g., advanced age, end stage renal disease [ESRD], advanced cardiovascular [CVD] or cerebrovascular disease, or other coexisting diseases or conditions that will materially shorten life expectancy or diminish quality of life).

In older persons with diabetes mellitus (DM), increased risk of complications with intensive DM management is of concern in those who:

- Live alone
- Use insulin or take oral hypoglycemic agents
- Eat fewer than 2 meals per day or eat irregularly
- Abuse alcohol
- Have sensory impairment
- Have cognitive or emotional impairment
- Are unable to access food
- Have limited economic resources
- Are illiterate or have a limited educational background

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

Health care professionals must decide how best to implement these recommendations in multiple settings and in patients with diverse needs. It is essential to develop a habitual approach to the nutrition screening and assessment of nutritional status in older adults, and develop policies, protocols, and procedures to ensure the implementation of disease-specific nutritional interventions. The reader should refer to other Nutrition Screening Initiative (NSI) materials for additional information and to facilitate a systematic approach to nutritional care. NSI screening tools are included as

appendices of the original guideline document -- DETERMINE Your Nutritional Health Checklist and Levels I and II Screens. The Checklist was developed as a self-administered tool designed to increase public awareness of the importance of nutritional status to health and to encourage older people to discuss their own nutritional status with their primary provider. Based on this guided discussion, the provider can decide if additional screening or assessment is indicated. The Level I Screen was designed for administration by non-physician health care providers in community settings while Level II requires administration by physicians and physician-extenders that have the ability to order and interpret laboratory parameters indicative of nutritional health.

### Evaluation Criteria to Document Improved Health Outcomes

The evaluation criteria which help to document the impact of nutrition screening and intervention on the individual's health status are consistent with the goals of nutrition screening and intervention for diabetes mellitus (DM). They are:

- Improvement in or normalization of blood sugar. (Fasting plasma glucose of <110 mg/dl; 2-hour postprandial plasma glucose <140 mg/dl; or an oral glucose tolerance test with the 2-hour plasma glucose and intervening values <140 mg/dl after a 75 g glucose load)
- Glycosylated hemoglobin levels (HbA1c) levels of <6.5%
- Prevention of/improvement in the diet-related diseases associated with the development of DM:
  - Maintenance of a healthy weight. A body mass index (BMI) in the range of 22 to 27 for those age 65 years and older, or a weight in the desirable range on standard weight-for-height-tables is considered a healthy weight
  - Optimize blood pressure (<130/85 mm Hg)
  - Optimize blood lipid levels. A total cholesterol level <200 mg/dl (5.2 mmol/L), a low density lipoprotein level <130 mg/dl (3.4 mmol/L), a high density lipoprotein level >35 mg/dl (0.9 mmol/L), a triglyceride level < 200 mg/dl (2.3 mmol/L)
- Prevention of or improvement in the comorbidities associated with unrecognized or poorly controlled DM.

### Evaluation Criteria to Document the Impact of Nutrition Management on the Health Care System

In addition to the evaluation criteria listed above, the following may be used to assess the impact of nutrition screening and intervention for DM on the delivery of health care. Reductions or improvements in these indicators could be used to document a positive impact of nutrition screening and intervention in individuals to whom routine and appropriate nutritional care is made available.

- Incidence/improvement in diet-related diseases or conditions that contribute to DM
- Type, quantity, or number of doses of a medication(s) needed to treat DM

- Number of visits to the health care provider needed to successfully manage DM
- Rates of admission to or length of stay in acute or long term care settings for the management of DM or its consequences
- Incidence/severity of sequelae associated with unrecognized or poorly controlled DM

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness  
Staying Healthy

### IOM DOMAIN

Effectiveness  
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

White JV. Diabetes mellitus. Nutrition management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 14 p. [22 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2002

### GUIDELINE DEVELOPER(S)

American Academy of Family Physicians - Medical Specialty Society  
American Dietetic Association - Professional Association  
Nutrition Screening Initiative - Professional Association

### GUIDELINE DEVELOPER COMMENT

The Nutrition Screening Initiative (NSI) is a partnership of the American Academy of Family Physicians (AAFP) and the American Dietetic Association (ADA). It is funded in part through a grant from Ross Products Division, Abbott Laboratories.

Additional information can be obtained from the [AAFP Web site](#) and the [ADA Web site](#).

#### SOURCE(S) OF FUNDING

The Nutrition Screening Initiative (NSI) is funded in part through a grant from Ross Products Division, Abbott Laboratories.

#### GUIDELINE COMMITTEE

Not stated

#### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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#### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

#### GUIDELINE STATUS

This is the current release of the guideline.

#### GUIDELINE AVAILABILITY

Electronic copies: Available from the [American Academy of Family Physicians \(AAFP\) Web site](#) and to members only from the [American Dietetic Association \(ADA\) Web site](#).

Print copies: Not available

#### AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Nutrition Screening Initiative (NSI). A physician's guide to nutrition in chronic disease management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 18 p.

Electronic copies available in Portable Document Format (PDF) from the [American Academy of Family Physicians \(AAFP\) Web site](#) and the [American Dietetic Association \(ADA\) Web site](#).

Electronic copies also available for download in Personal Digital Assistant (PDA) format from the [American Academy of Family Physicians \(AAFP\) Web site](#).

Print copies: Available from Ross Educational Service Materials; Phone: (800) 986-8503; Web site: [www.Ross.com/nsi](http://www.Ross.com/nsi).

## PATIENT RESOURCES

The following is available:

- Managing chronic disease. Food tips if you need extra nutrients. In: Nutrition Screening Initiative (NSI). A physician's guide to nutrition in chronic disease management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 4 p.

Electronic copies available in Portable Document Format (PDF) from the [American Academy of Family Physicians \(AAFP\) Web site](#) and the [American Dietetic Association \(ADA\) Web site](#).

Electronic copies also available for download in Personal Digital Assistant (PDA) format from the [American Academy of Family Physicians \(AAFP\) Web site](#).

Print copies: Available from Ross Educational Service Materials; Phone: (800) 986-8503; Web site: [www.Ross.com](http://www.Ross.com).

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

## NGC STATUS

This summary was completed by ECRI on April 16, 2004. The updated information was verified by the guideline developer on June 21, 2004.

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