



Complete Summary

GUIDELINE TITLE

Osteoporosis. Nutrition management for older adults.

BIBLIOGRAPHIC SOURCE(S)

Dwyer J. Osteoporosis. Nutrition management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 22 p. [50 references]

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Osteoporosis

GUIDELINE CATEGORY

Counseling
Evaluation
Management
Prevention
Risk Assessment
Screening
Treatment

CLINICAL SPECIALTY

Family Practice
Geriatrics
Internal Medicine
Nutrition
Physical Medicine and Rehabilitation

INTENDED USERS

Advanced Practice Nurses
Dietitians
Health Care Providers
Nurses
Occupational Therapists
Patients
Physical Therapists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

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

TARGET POPULATION

- Older adults with documented osteoporosis, either primary osteoporosis associated with aging or secondary osteoporosis resulting from medications or other diseases
- Older adults at risk of osteoporosis, including individuals with osteopenia, the earliest stage of bone mass loss

INTERVENTIONS AND PRACTICES CONSIDERED

Nutrition Screening and Evaluation

1. Risk assessment
2. Bone mineral density measurement
3. Weight and height measurements and calculation of body mass index (BMI)
4. Evaluation of food and nutrient intake, especially calcium and vitamin D intake; alcoholic beverage intake; current medication use; serum albumin level; physical activity level; smoking habits; functional, emotional, and cognitive status

Nutrition Interventions

1. Fracture prevention
2. Nutritional status optimization
3. Ensuring adequate calcium and vitamin D intake through diet, supplements, and/or sun exposure
4. Ensuring adequate protein and calorie intake
5. Limitation of alcohol intake
6. Limitation of sodium and caffeine intake
7. Avoidance of vitamin A megadoses
8. Promotion of regular physical activity
9. Smoking cessation

10. Consideration of changes in medication use (e.g., limiting corticosteroids and anticoagulants)
11. Use of hormone replacement therapy

MAJOR OUTCOMES CONSIDERED

- Impact of nutritional status on osteoporosis
- Adverse health outcomes associated with osteoporosis and fractures
- Effects of nutrition management on health outcomes (bone mineral density, bone loss, incidence of falls and fractures, hospital admission, quality of life)
- Risk factors associated with development of osteoporosis

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

Half (50%) of hip fracture victims will be unable to walk without assistance, and 25% require long term domiciliary care. Complications related to poor nutritional status among hip fracture patients are estimated to cost the health system an average of \$2,198 more per patient. The morbidity and suffering associated with wrist and spinal fractures is also considerable.

In patients with hip fracture the comorbidity of malnutrition adds another \$2,198 to the hospitalization costs per patient stay. Studies have shown that patients hospitalized for hip fracture consume only 60% of the calories and nutrients they need to maintain nutritional health. Poorly nourished individuals had a higher prevalence of complications, were less likely to return to their pre-fracture environment, and tended to remain in the hospital longer than individuals who were better nourished. Mortality rates in malnourished patients with a hip fracture were higher than in their better-nourished peers.

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 Osteoporosis

At present, no commonly agreed upon guidelines exist on who should have a bone mineral density measurement. However there is agreement that certain patients need bone density measurements, such as those who have been on glucocorticoid

therapy for more than 2 months, and those with other conditions placing them at high risk for osteoporotic fracture. In addition, those who are being considered for treatment to prevent osteoporotic fractures should have a bone density measurement.

At a minimum, nutrition screening for individuals at risk for or who already have established osteoporosis should include the following:

- Measurement of:
 - Height (annually in those aged 65 and older; more frequently if feasible, in those with severe back pain or evidence of vertebral compression)
 - Body weight at each office visit
- Assessment of bone density (baseline at menopause and annually or as therapeutic monitoring needs dictate, by whatever method is most appropriate).
- Evaluation of:
 - Food and nutrient intake (especially with respect to good calcium and vitamin D food sources, mainly dairy products)
 - Intake of alcoholic beverages
 - Current medication use
 - Serum albumin level (should be >3.5 gm/dl)
 - Functional, emotional, and cognitive status, if deficits are suspected
 - Physical activity level and exercise tolerance
 - Smoking habits

The Nutrition Screening Initiative's (NSI 1992) DETERMINE Your Nutritional Health Checklist and Levels I and II Screens (see appendix in the original guideline document) provide a structured approach to assess the majority of the elements above. The Level II Screen can be a resource in the identification and treatment of nutritional risk factors associated with osteoporosis. Additional brief screening instruments have been developed for use in the evaluation of patients prior to surgical intervention for hip fracture and for patients entering a rehabilitation setting. These can also be of assistance in the preliminary evaluation of nutritional status and the initial implementation of interventions. Continued evaluation of patient status and modifications of interventions accordingly are essential to prevent further deterioration in nutritional status and health.

Nutrition Intervention Guidelines for Osteoporosis

Nutrition intervention in people who are already at risk for or with established osteoporosis consists of one or more of the following:

- Maximize fracture prevention.
- Optimize nutritional status. Attain or maintain a body mass index (BMI) of 22 to 27. Consider high calorie, calcium- and nutrient-rich foods or liquid supplements if weight loss is a problem
- Adequate calcium and vitamin D intake are crucial for developing optimal peak bone mass and preserving bone mass throughout life. For those who do not achieve recommended intakes from dietary sources, bioavailable supplements should be considered.

- Calcium intake: A range of 1,000 to 1,200 mg/day (1,300 mg for teenagers 9 to 18 yr) is the current recommendation for calcium from the Food and Nutrition Board, National Academy of Sciences. Levels of elemental calcium of 1,500 to 2,000 mg/day are safe for most adults. Adequate calcium intake increases spine bone mineral density and reduces vertebral and non-vertebral fractures. The consumption of both naturally calcium rich and calcium-fortified foods should be encouraged. Of 52 controlled studies, all but two showed positive benefits to skeleton in maintaining bone density, and/or decreasing fractures. Calcium supplements must be absorbable and should have USP designation. The bioavailability of calcium in some fortified foods and supplements is lower than it is in milk products and so more may need to be consumed.
- Vitamin D intake: The range of vitamin D intake currently recommended for US adults is 5 to 10 micrograms, or 200 to 400 IU daily. In patients receiving calcium and vitamin D in prospective studies, hip and other non-vertebral fractures have been reduced. Sunlight exposure of 10 to 30 minutes at mid-day daily can also increase serum vitamin D levels. However, in many parts of the United States sun exposure is impractical for some or most of the year. Shut-ins and individuals who use heavy sunscreens may need to consume higher levels of vitamin D in foods (10 to 20 micrograms or 400 to 800 IU) than others. The combination of calcium/vitamin D supplement prevented hip fractures in elders in a long term care facility and nonvertebral fractures in ambulatory elders.
- Alcohol intake: Excess alcohol intake is deleterious to bone, whereas moderate alcohol consumption is associated with increased bone density in post-menopausal women.
- Sodium Intake: Low sodium intake is desirable.
- Caffeine intake: Those who consume very large amounts of caffeine should be encouraged to drink milk and/or obtain calcium from other sources. In one study, lifetime caffeinated coffee intake that was equivalent to 2 cups per day was associated with decreased bone density in women who did not drink milk on a daily basis. However, the calcium in 2 tablespoons of milk per cup of coffee counters these caffeine associated calcium losses.
- Vitamin A: Megadoses should be avoided.
- Promote regular physical activity, especially regular weight-bearing exercise or high-impact, high-intensity strength and resistance training exercises. These may stimulate accrual of bone mineral content in the skeleton and may also help to reduce falls in older persons. These activities should be consistent with the individual's ability and physical status.
 - Achieve or maintain peak bone mass. The best defense against later osteoporosis is strong bones prior to age. Maximizing calcium intake during peak periods of bone mineralization in childhood, adolescence, and pregnancy is critical to maintenance of optimal bone health later in life.
 - Provide education to help reduce the likelihood of falls. Understand and seek to limit factors that contribute to increased risk of falling. These include gait and balance disorders, weakness, dizziness, environmental hazards in the house, confusion, visual impairment, postural hypotension, and being alone more than 10 hours per day.

- Smoking cessation. Cigarette smoking reduces bone mineral density by an average of 5 to 8% in both men and women.
- Medication use (i.e., corticosteroids, anticonvulsants, anticoagulants, heparin, thyroid hormone, vitamin A in large doses). Consider limited use or use of alternatives in people at high risk for osteoporosis/fracture.
- Replacement hormones. Assess the appropriateness of hormone replacement therapy (HRT) in post-menopausal women, especially those at high risk.

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

Benefits of Nutrition Management to Patients

The benefits of nutritional screening and intervention among individuals at risk for osteoporosis and those with established disease are considerable. However, clinical risks do not predict those with low or normal bone mineral density, but they can help to retard further losses. Adequate calcium and protein intake coupled with resistance exercise is thought to increase bone density during periods of skeletal growth such as childhood and adolescence. It also seems to reduce/prevent bone loss in old age and maximizes quality of life. Screening and treatment of osteoporosis at menopause helps to reduce the substantial loss of bone in the following 10 years. Considerable benefits can also be derived from screening elderly women and men (>80 years), since loss of bone accelerates in old age and therapies that slow bone mass loss reduce fracture risk in this age group.

Benefits of Nutrition Management to Health Services Providers

Reduction of osteoporosis and associated fractures can potentially save the health care system a great deal of money. Optimization of peak bone mass during youth involves a combination of dietary measures. These include diet (especially calcium, protein, and vitamin D), physical activity, and resistance exercise. These same factors coupled with diet and hormone replacement therapy at menopause have a significant potential to reduce health care costs. Many youth and elderly fail to consume sufficient calcium to meet their needs. Preventive strategies designed to reduce falls and prevent bone fragility in a population of elderly women living in nursing homes reduced hip fracture rates by over 25% in three years.

In patients with hip fracture the comorbidity of malnutrition adds another \$2,198 to the hospitalization costs per patient stay. Studies have shown that patients hospitalized for hip fracture consume only 60% of the calories and nutrients they need to maintain nutritional health. Poorly nourished individuals had a higher prevalence of complications, were less likely to return to their pre-fracture environment, and tended to remain in the hospital longer than individuals who were better nourished. Mortality rates in malnourished patients with hip fracture were higher than in their better-nourished peers.

POTENTIAL HARMS

Not stated

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

Evaluation criteria that help document the impact of nutrition screening and intervention on the health status of patients with osteoporosis are consistent with the goals of nutrition screening and intervention for osteoporosis. They are listed below:

- Maintenance or restoration of bone mass
- Preservation of height, if possible
- Prevention of spinal deformity
- Optimization of food and nutrient intake (especially calcium, vitamin D, calories, protein)
- Serum albumin over 3.5 g/dl
- Maintenance or delay of decline in functional status
- Weight bearing exercise consistent with health and ability

- Moderation of alcohol intake to no more than 1 drink per day for women and 2 drinks per day for men
- Smoking cessation

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

In addition to evaluation criteria such as those listed above, the following, other measures may be used to assess the impact of nutrition screening and intervention for osteoporosis on the health care delivery system. Reductions or improvement in these indicators could be used to document a positive impact of nutrition screening and intervention in populations to whom routine and appropriate nutritional is made available:

- Incidence of osteoporosis-associated fractures in the target population served
- Frequency and/or cost of hospital admissions/readmissions for osteoporosis-related conditions
- Hospital length of stay
- Rate/prevalence of admission to institutional settings
- Frequency of visit to the health care provider to successfully manage osteoporosis/associated fractures

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)

Dwyer J. Osteoporosis. Nutrition management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002. 22 p. [50 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

Primary author: Johanna Dwyer, DSc, RD, Professor of Medicine and Community Health, Schools of Medicine and Nutrition and Senior Scientist, Jean Mayer Human Nutrition Research Center on Aging at Tufts University, and Director, Frances Stern Nutrition Center, New England Medical Center Hospital

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.

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/nsi.

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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contact Marti Andrews, Ross Products Division, at (614) 624-3381, e-mail: marti.andrews@abbott.com.

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