

Nutritional Management in Long-Term Care: Development of a Clinical Guideline

David R. Thomas,¹ Wendy Ashmen,² John E. Morley,¹ William J. Evans,³ and the
Council for Nutritional Strategies in Long-Term Care

¹Division of Geriatric Medicine, Saint Louis University School of Medicine, Missouri.

²Programs in Medicine, Newton Square, Pennsylvania.

³Donald W. Reynolds Center on Aging, UAMS Medical Center, Little Rock, Arkansas.

Background. Involuntary weight loss resulting from malnutrition is a major problem among residents in long-term care facilities. Although body weight is easily measured, the evaluation of unintended weight loss in long-term care facilities is difficult.

Methods. The Council for Nutritional Clinical Strategies in Long-Term Care, an expert panel of interdisciplinary thought leaders representing academia and the medical community, derived a structured approach aimed at improving management of malnutrition in long-term care settings, using literature review and consensus development. The *Clinical Guide to Prevent and Manage Malnutrition in Long-Term Care* is based on a best-evidence approach to the management of nutritional problems in long-term care.

Results. The Clinical Guide is divided into two parts, one designed for nursing staff, dietary staff, and dietitians, and a second directed to physicians, pharmacists, and dietitians.

Conclusions. A structured approach to the management of unintended weight loss or malnutrition in long-term care is intended to ensure a comprehensive resident evaluation. While the Clinical Guide is presented in a linear fashion, many of the considerations can be done simultaneously and the order varied dependent on the individual resident's needs. Further research to validate the effectiveness of using the algorithm in long-term care settings will be required.

INVOLUNTARY weight loss resulting from malnutrition is a major problem among residents in long-term care facilities (Table 1). The prevalence of protein-energy malnutrition in nursing home residents ranges from 23–85% (1, 2). Among those patients newly admitted to a Baltimore long-term care setting, a point prevalence of 54% malnutrition was observed (3). In a Swedish study, 29% of new admissions to a long-term care geriatric hospital were malnourished, defined by anthropometry, serum protein analysis, and delayed hypersensitivity skin test (4).

Malnutrition in elderly populations is associated with poor clinical outcomes and is an indicator of risk for increased mortality. Patients with severe malnutrition are at higher risk for a variety of complications (5), and a number of chronic medical conditions are associated with increased risk of malnutrition (Tables 2 and 3). Identification of malnutrition should lead to early intervention, which may correct reversible nutritional deficits.

Two Congressional acts, the Omnibus Budget Reconciliation Act of 1987 (OBRA 1987) and the Balanced Budget Act of 1997 have had a major impact on nutrition standards in long-term care settings. The regulations state that, based on a resident's comprehensive assessment, the facility must ensure (a) that a resident maintains acceptable parameters of nutritional status, such as body weight and protein levels, unless the resident's clinical condition demonstrates that this is not possible; and (b) that a resident receives a therapeutic diet when there is a nutritional problem.

Body weight is easily measured and used as a critical first sign of malnutrition in the nursing home. Clearly, a large number of nursing home residents lose weight during their stay. Involuntary weight loss, reduced appetite, and cachexia are common in the geriatric population and are often unexplained (6). Appetite is regulated by a variety of psychological, gastrointestinal, metabolic, and nutritional factors. Appetite regulators in the central feeding and peripheral satiation systems have been extensively reviewed (7, 8).

Although body weight is easily measured, the evaluation of unintended weight loss in long-term care facilities is difficult (9). Whether anorexia and weight loss are reversible or unavoidable requires a careful clinical evaluation in the individual patient. A structured approach to the differential diagnosis of malnutrition in long-term care was developed by the Council for Nutritional Clinical Strategies in Long-Term Care.

METHODS

An expert panel of interdisciplinary thought leaders representing academia and the medical community joined together to form the Council for Nutritional Clinical Strategies in Long-Term Care. The Council convened a summit meeting in May 1998 to review the current state of the science in nutrition management, to identify major issues surrounding prevention and treatment of malnutrition in the elderly population, and to identify evidence-based recommendations for the management of malnutrition in long-term

Table 1. Nutritional Status of Nursing Home Patients

Author (Reference)	Year	n	Prevalence	Time	Outcome
Shaver et al. (54)	1980	115	PCM 85% BMI 43%	6 mo	48% death rate in anergic residents
Pinchocofsky-Devin et al. (55)	1987	227	PCM 52%		
Silver et al. (1)	1988	130	BMI 23% Low albumin 8%	1 year	Mortality not associated with BMI
Thomas et al. (3)	1991	61	PCM 54%	2 mo	Mortality associated with malnutrition. Improvement in only 63%
Larsson et al. (56)	1991	501	PCM 29%		
Nelson et al. (57)	1993	100	PCM 39%		
Wright (58)	1993	309	51% had 5% weight loss	6 mo	Slightly increased mortality (15% vs 12%)
Abbasi/Rudman (59)	1993	2811	Underweight 11% Low albumin 27.5%		Recognition by physicians from 7% to 100%
Morley/Kraenzle (44)	1994	185	15% had 5% weight loss	6 mo	Depression most common cause of weight loss
Blaum et al. (18)	1995	6832	9.9% had 5% weight loss Low BMI 25%		Poor intake, eating dependency, depression predicts malnutrition

Notes: PCM = protein calorie malnutrition; BMI = body mass index.

care. Subsequent to that summit meeting, a comprehensive literature search was conducted through the National Library of Medicine's Medline Database using key MeSH terms, such as anorexia, weight loss, appetite, protein-energy malnutrition, nutritional status, aged and aging.

The Council reviewed existing literature to formulate protocol-driven recommendations to serve as a clinical guide for the management of malnutrition in the long-term care setting. Where evidence existed, it served as the basis for specific recommendations. In the absence of evidence, a modified Delphi approach was used to obtain consensus. The Council conducted a series of regional consensus meetings and a closed Internet discussion forum to gain input from academic thought leaders. This input refined recommendations that were published in March 1999 as a monograph from the Council for Nutritional Clinical Strategies in Long-Term Care, entitled *Anorexia in the Elderly* (10). The monograph presented the recommendations graphically in a

parallel algorithmic approach. The algorithms were formally introduced at a satellite symposium during the annual meeting of the American Medical Directors Association on March 5, 1999.

Subsequent to their publication and introduction, in July 1999, representatives from the American Dietetic Association (ADA) met with the Council to discuss the algorithms in light of the introduction of the ADA's Health Care Financing Administration-mandated risk assessment tool. Pursuant to that meeting, the algorithms were revised to include key quality indicators related to malnutrition and dehydration, minimum data set indicators, and additional food/environmental considerations. In addition, a subcommittee was formed to develop the Nursing Nutritional Checklist for use in care planning aligned with the revised algorithms. This checklist received consensus approval by the Council in October 1999 and was introduced at a satellite symposium during the annual meeting of the American Society of Consult-

Table 2. Risk Associated With Undernutrition

Author (Reference)	Year	n	Time	Outcome
Bistran et al. (60)	1977	12	—	Impaired delayed hypersensitivity skin test
Weinsier et al. (61)	1979	134	2 weeks	Longer hospital stay (20 vs 12 days), increased mortality (13% vs 4%)
Warnold/Lundholm (62)	1984	215	29 days	Increased postoperative complications (31% vs 9%)
Pinchocofsky-Devin et al. (63)	1986	—	—	Undernutrition associated with pressure ulcers
Detsky et al. (64)	1987	202	—	Increased postoperative complications
Dwyer et al. (65)	1987	335	4 years	Loss of 4.5 kg associated with increased death
Windsor/Hill (66)	1988	102	—	Increased sepsis, pneumonia, longer stay
Berlowitz/Wilking (67)	1989	—	—	Impaired nutritional intake associated with pressure ulcers
Chang et al. (68)	1990	199	5 years	10% weight loss associated with death and functional impairment
Brandeis et al. (69)	1990	—	—	Difficulty feeding oneself associated with pressure ulcers
Thomas et al. (70)	1991	61	2 mons	Increased mortality
Windsor (71)	1993	—	—	Increased postoperative complications
Murden/Ainslie (72)	1994	146	2 years	10% weight loss predicts death
Kaiser et al. (73)	1994	5	—	Impaired immune dysfunction, decreased CD4 & T lymphocytes
Franzoni et al. (74)	1996	72	28 mons	Low triceps skinfold thickness predicts death
Berkhout et al. (75)	1997	264	3 years	Increased death in low BMI or weight loss within 3 months of admission
Flacker/Kiely (76)	1998	780	2 years	Weight loss and low BMI associated with death
Gambassi et al. (77)	1999	9264	23 mons	Malnutrition independent predictor of death (RR 1.31)
Perry et al. (78)	1999	400	2 years	Weight loss of 5% predicts mortality at 6 months
Sullivan et al. (79)	1999	102	3 mons	Higher rate mortality (relative risk, 8.0) and 90-day mortality (relative risk, 2.9)

Table 3. Medical Conditions Associated With Protein Energy Malnutrition in Nursing Home Residents

Medical Condition	Mechanism			
	Increased Metabolism	Anorexia	Swallowing Difficulties	Malabsorption
Cardiac disease	X	X		X
Cancer	X	X	X	X
Pulmonary disease	X	X		X
Infection(s)		X		X
AIDS	X	X	X	X
Tuberculosis	X	X		
Esophageal candidiasis		X	X	
Alcoholism	X	X		X
Rheumatoid arthritis	X	X	X	X
Gallbladder disease		X		
Malabsorption syndromes				X
Hyperthyroidism/ hyperparathyroidism	X	X		
Parkinson's disease	X			
Essential tremors	X			

ant Pharmacists on November 10, 1999. A series of regional meetings were conducted to present the revised algorithms and nursing checklist and to address questions related to their use within long-term care.

In order to gain support of the algorithms from a respected peer association and establish a research initiative where lack of evidence exists, the Council met with an independent peer-review committee selected by The Gerontological Society of America in February 2000. Based on input from that meeting, the algorithms were retitled *Clinical Guide to Prevent and Manage Malnutrition in Long-Term Care*. Further revisions were made to provide clarification of specific recommendations and to ensure an understanding that although the recommendations are graphically presented as a linear guide for simplicity, many of the protocol-driven suggestions are intended to be implemented simultaneously with their order varying, dependent on individual resident needs.

THE CLINICAL GUIDELINES

The Clinical Guide is divided into two parts, one designed for nursing staff, dietary staff, and dietitians and a second designed for physicians, pharmacists, and dietitians. The Clinical Guide for nursing staff, dietary staff, and dietitians (Figure 1) and the Nursing Nutritional Checklist (Figure 2) are designed to clarify information necessary to develop a care plan and to inform the physician about the resident's condition. The Clinical Guide for physicians, pharmacists, and dietitians focuses on differential diagnosis (see Figure 3). The phrase "quality indicator conditions" in the figures refers to the Minimum Data Set Resident Assessment Protocol (MDS RAP) triggers.

The Clinical Guide for Nursing, Dietary, and Dietitian Staff

Clinical triggers.—Both clinical guidelines were originally triggered by three factors. These parameters were derived from OBRA 1987 guidelines: (a) involuntary weight

loss of greater than 5% in 30 days or 10% in 180 days; (b) leaving more than 25% of food in the past 7 days or two thirds of meals based on a 2000 kcal diet; or (c) a body mass index (BMI, calculated as weight divided by height squared) of equal to or less than 19.

Age- and gender-adjusted BMI below the 10th decile has been used to define undernutrition (<19 in men and <19.4 in women). In hospitalized adults with serious illness, excess mortality within 6 months (risk ratio 1.23, $p < .001$) has been demonstrated when the BMI is less than 20 (11). The increase in mortality is linear—the lower the BMI, the greater the risk. Increased risk of death has been shown to begin at a BMI <23.5 in men and <22.0 in women (12). The Clinical Guidelines revised the BMI at 21, however, because a body mass index of less than 21 has been shown to be associated with increased mortality and may result in earlier intervention (13).

Advanced directives.—Whenever a resident has a weight loss problem, it is essential that they or their proxy have a full discussion of their health care wishes with a health care professional. A discussion of the treatment goals and the resident's ongoing quality of life should be initiated at this point. The decision that they make should be documented and guide how aggressively the algorithm is utilized.

Medical conditions.—Medical conditions that may be associated with anorexia, such as decreased food intake, or increased metabolic requirements should be assessed. Increased metabolic requirements may be precipitated by fever, infection, or the presence of chronic skin wounds. Anorexia may be associated with illness, drugs, dementia, or mood disorders (14–16). Decreased food intake may result from dysphagia (17), chewing problems (18), nausea, vomiting, diarrhea, pain, or fecal impaction. Treatment of these conditions may restore appetite and body weight.

Hydration.—Fluid intake and hydration status may affect body weight. An assessment of hydration status may account for weight loss due to low fluid intake. Dehydration may be difficult to detect by clinical signs alone and require the use of biochemical parameters (19). The recommended amount of fluid consumed by nursing home residents is confusing. Amounts range from 1 mL/kcal (20), 30 mL/kg body weight (21), or the sum of 100 mL fluid per kg for the first 10 kg actual body weight, 50 mL fluid per kg for the next 10 kg actual body weight, and 15 mL fluid per kg for the remaining kilograms actual body weight (22). Direct observations of institutionalized adults indicate a total fluid intake, including fluids derived from meals, of $1,783 \pm 545$ mL (19). When compared to the standard of 1 mL/kcal and 30 mL/kg, recommended intakes were low, primarily due to low body weight or low caloric intake. The calculated value provides at least 1500 mL daily, even for residents with low weight. A general recommendation suggests that residents should ingest 1500 to 2000 mL of fluid per day (23), though a recent study and accompanying editorial have suggested that community-dwelling adults consume about 1000 mL per day (24, 25).

Clinical Guide to Prevent and Manage Malnutrition in Long-Term Care

FOR NURSING STAFF AND DIETARY STAFF AND DIETITIANS (EVALUATE, DOCUMENT AND TREAT)



The American Dietetic Association supports the Clinical Guide to Prevent and Manage Malnutrition in Long-Term Care. Representatives from the American Dietetic Association were instrumental in its development.

These Guidelines were developed by the Council for Nutrition convened by Programs in Medicine under a grant from Bristol-Myers Squibb. A special committee of The Gerontological Society of America (GSA) served as critical reviewers and provided input and modification of the final Guidelines. While GSA does not endorse specific clinical measures, we support the principles underlying these Guidelines and their potential to improve nutrition in the nursing home.

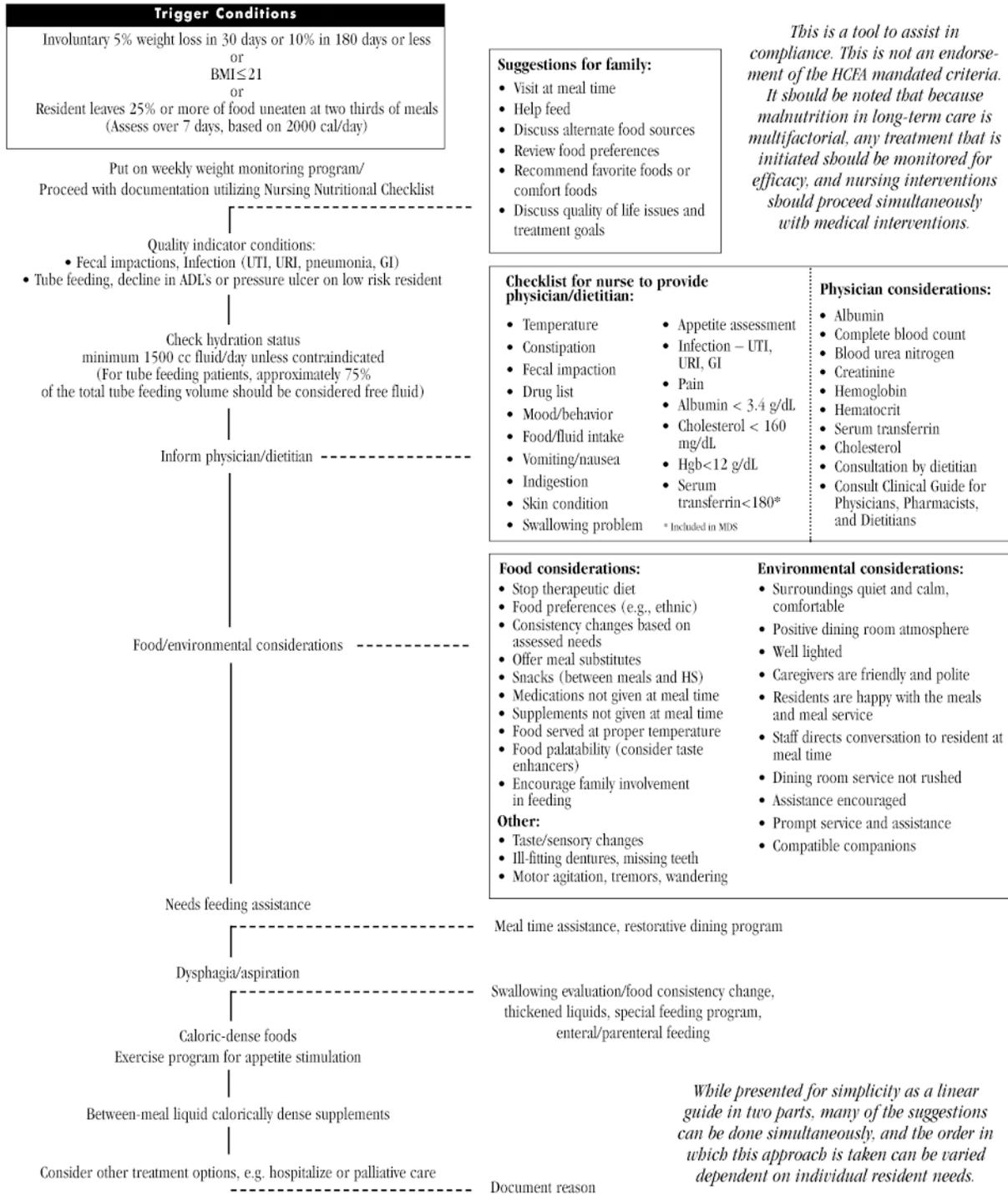


Figure 1.

Nursing Nutritional Checklist (for use in Care Planning)

The American Dietetic Association supports the Nursing Nutritional Checklist (for use in Care Planning).
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Problem List (check all that apply)

- 1. Patient has $\geq 5\%$ involuntary weight loss in 30 days?
- 2. Patient has $\geq 10\%$ involuntary weight loss in 180 days or less.
- 3. BMI is ≤ 21 . ($703 \times \text{weight in lbs}/\text{height in inches}^2$ or weight in kilograms/height in meters²)
- 4. Resident leaves 25% or more food on tray? (in last 7 days)
- 5. Quality Indicators — Does patient have:
 - A. Fecal impaction in last 7 days
 - B. Infection (UTI, URI, Pneumonia, GI) in last 7 days
 - C. Tube feeding
 - D. Functional ADL decline
 - E. Development of pressure ulcer in low risk patient
- 6. Patient takes in $\leq 1500\text{cc}$ fluid/day for the last 7 days?
Is patient on fluid restriction?
- 7. Available labwork completed in the last 30 days:

Hgb _____	Albumin _____
Hct _____	Cholesterol _____
Serum WBC _____	U/A: _____
Sodium _____	Urine WBC _____
Potassium _____	Spec. Gravity _____
Glucose _____	Leuk. Esterase _____
BUN _____	Other _____
Creatinine _____	
- 8. Nursing assessment of physical/psychological problems
 - A. Skin (pressure ulcers and skin tears)
 - B. Presence of fever (2° above baseline)
 - C. Presence of diarrhea
 - D. Presence of constipation
 - E. Takes drugs other than multivitamins/minerals
 - F. Symptoms of depression/anxiety
 - G. Loss of usual appetite
 - H. Presence of nausea/vomiting
 - I. Presence of dysphagia/choking
 - J. Ill-fitting dentures, missing teeth, periodontal disease
- 9. Not satisfied with food currently offered (for example, ethnic preferences)
- 10. Patient needs meal time assistance
- 11. Patient has motor agitation, tremors, or wanders
- 12. Presence of environmental distractions or meal time environment concerns
- 13. Inadequate lighting in the dining room
- 14. Patient needs 30–60 minutes to eat
- 15. Patient is unable to tolerate current food consistency
- 16. Supplements are given at meal time
- 17. Medications are given at meal time
- 18. Impaired visual acuity
- 19. Impaired hearing
- 20. Patient has a decline in taste and smell

Suggested Action Plan (check when completed)

- 1-4. Monitor weight weekly.
Continue to step #5 on problem list
- 5.
 - A. Implement bowel program
 - B. Get physician order for U/A
 - C. Contact dietitian for assessment
 - D. Consider OT/PT assessment
 - E. Implement skin program
- 6. Develop systematic plan to ensure adequate fluid intake (e.g., 300 mL with meals and 240 mL between meals)
- 7. Notify physician of values
- 8.
 - A. Implement skin program
 - B. Implement facility protocol
 - C. Implement facility protocol
 - D. Implement facility protocol
 - E. Contact pharmacy consultant for drug review
 - F. Evaluate for depression/anxiety (short geriatric mini depression scale)
 - G. Implement care plan to increase appetite
 - H. Implement facility protocol
 - I. Contact dietitian for evaluation
 - J. Contact dentist or dental technician
- 9. Stop therapeutic diets and provide preferred foods/food substitutions
- 10. Provide timely, polite assistance during dining
 - Provide tray set up
 - Provide partial assistance/supervision (evaluate resident/staff ratio and supervision by licensed professional staff)
 - Provide total assistance (consider resident/staff ratio and supervision by licensed professional staff)
 - Consider training staff to provide meal time assistance
- 11. Consider OT evaluation
 - Provide meal time assistance
 - Provide self-help feeding devices
 - Offer finger foods
- 12. Minimize environmental distractions
 - Provide compatible companions
- 13. Evaluate location in dining room
- 14. Implement dining program, e.g. special area to eat for impaired residents or two meal time sessions
- 15. Contact dietitian for texture screen
- 16. Give liquid supplements in a pattern that optimizes nutrient intake
- 17. Contact pharmacist for appropriate administration time
- 18. Assure resident is wearing clean glasses at meal time
 - Provide meal time assistance (see #10)
- 19. Ensure that hearing aid is in place and working at meal time
- 20. Season foods
 - Serve food at proper temperature

When problem list is completed, contact physician, dietitian and pharmacist as appropriate with suggested action plan.

Completed by: _____ Date: _____

Figure 2.

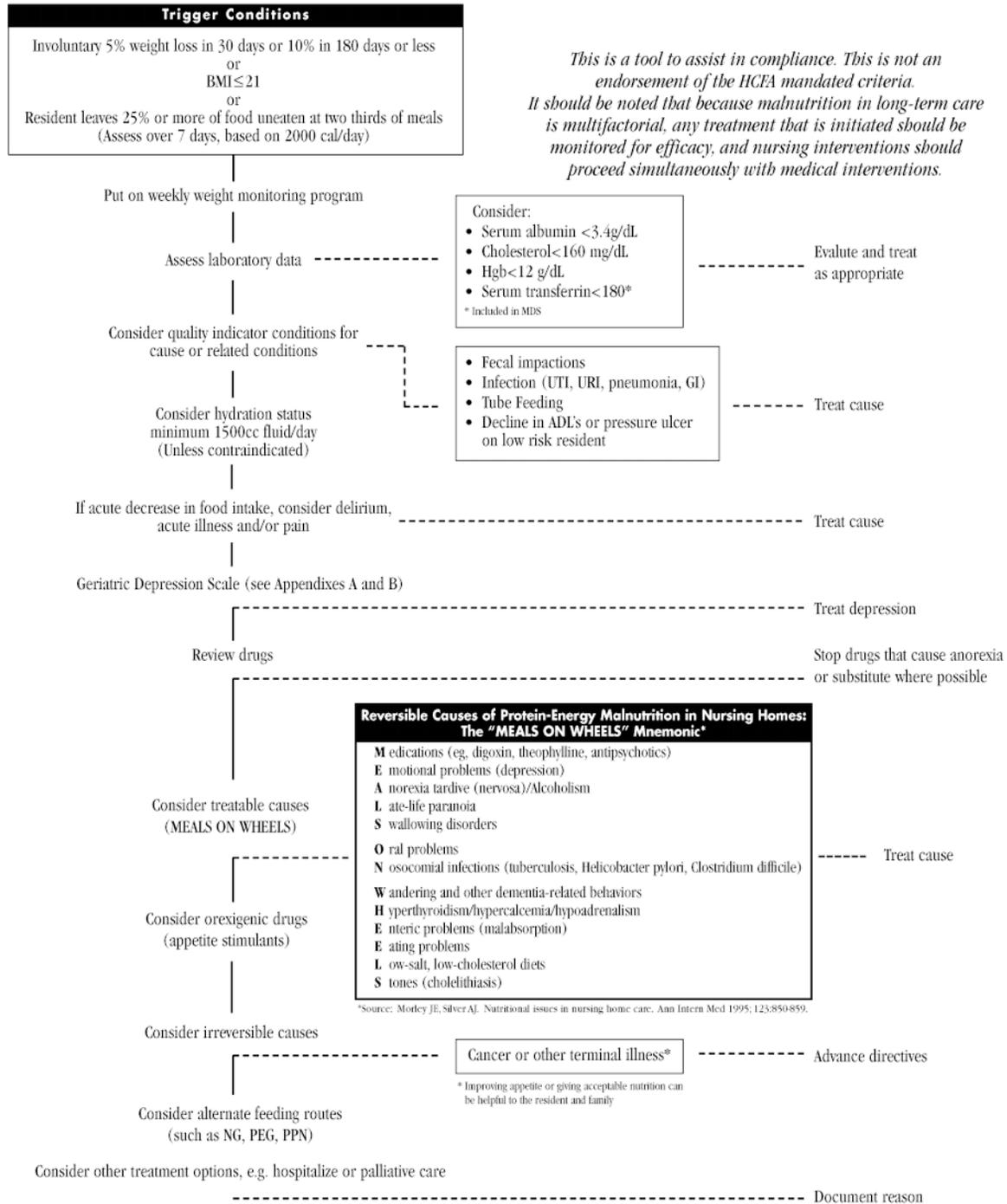
Clinical Guide to Prevent and Manage Malnutrition in Long-Term Care

FOR PHYSICIANS, PHARMACISTS, AND DIETITIANS (EVALUATE, DOCUMENT AND TREAT)



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This is a tool to assist in compliance. This is not an endorsement of the HCFA mandated criteria. It should be noted that because malnutrition in long-term care is multifactorial, any treatment that is initiated should be monitored for efficacy, and nursing interventions should proceed simultaneously with medical interventions.

While presented for simplicity as a linear guide in two parts, many of the suggestions can be done simultaneously, and the order in which this approach is taken can be varied dependent on individual resident needs.

Figure 3.

Laboratory parameters.—Evaluation of available biochemical parameters associated with malnutrition should be considered at this point. Suggested biochemical parameters include serum albumin (26), cholesterol (27), hemoglobin, and serum transferrin. While these parameters may be abnormal in several conditions unassociated with malnutrition, they are useful as guides to intervention (28). Abnormalities in laboratory parameters should be treated.

Environmental factors.—Food and environmental conditions that may affect intake should be considered in a continuing evaluation. Unpalatability due to overly restricted diets may cause decreased intake (29). Consideration of food preferences, food consistency (30, 31), food temperature, and snacks should be included. Provision of pleasant, well-lighted, unhurried mealtimes in a social environment may increase intake (32). Dependency in eating is associated with increased mortality (33). Residents needing feeding assistance require a restorative feeding program (32). Recognition of feeding problems and proper feeding techniques may improve weight loss in nursing homes. Dysphagia and swallowing disorders, with or without recurrent aspiration, require swallowing interventions, alteration of food consistency, or consideration of enteral or parenteral feeding (34).

Nursing Nutritional Checklist.—The Nursing Nutritional Checklist (see Figure 2) is designed as a supplement to the Clinical Guide to focus the comprehensive nutritional evaluation and introduce suggestions for implementing a plan of care. Notification of the results of the initial assessment to the attending physician, based on the Nursing Nutritional Checklist, should occur at this point. This checklist can be used as a communication tool to the attending physician and other members of the interdisciplinary team and may be faxed, mailed, or made available to the attending physician during nursing home visits.

Interventions.—Continued interventions by the facility staff should occur. Early interventions include family involvement, with visits or assistance with feeding at mealtimes (35), exploration of alternate food sources, evaluation of food preferences, and identification of favorite foods. Increased nutrient intake may be achieved by use of calorie-dense foods (36). Exercise may increase dietary intake (37–39). Nutritional supplementation can increase dietary intake and produce weight gain (40, 41). Nutritional supplementation must be given between meals in order not to substitute for calorie intake at meals.

Failure to improve.—Failure to improve nutritional status with these measures requires consideration of enteral or parenteral feeding and hospitalization for more complete evaluation (42). The resident's wishes and advanced directives may lead to a decision for palliative care.

The Clinical Guide for Physicians, Pharmacists, and Dietitians

The Clinical Guide for physicians, pharmacists, and dietitians focuses on differential diagnosis. Intervention at this

point should include weekly weight assessments and a differential diagnostic approach. A mnemonic, MEALS ON WHEELS, is useful in considering the potential treatable causes of malnutrition (43). Laboratory data should be reviewed and treated as appropriate. Medical conditions reported on the Nursing Nutrition Checklist should be reviewed, including fecal impaction, infection, decline in activities of daily living associated with feeding dependency, pressure ulcer, or tube feedings.

Depression and mood disorders.—Delirium due to acute illness and/or pain may be a reversible cause of decreased dietary intake. Reversal of delirium may result in resumption of appetite.

Depression is a major cause of weight loss in long-term care settings, accounting for up to 36% of residents who lose weight (44). An evaluation for depression, using the Geriatric Depression Scale (45, 46), for example, should be obtained for residents with anorexia (see Figure 4).

Drugs.—Drugs have been found to be a cause of weight loss in long-term care residents (44). In consultation with the pharmacist, all drugs potentially aggravating anorexia should be discontinued (47). Drugs that stimulate appetite (orexigenic drugs) should be considered to reverse resistant anorexia (48–51). Yeh and colleagues (52) found that megestrol acetate increased weight in nursing home residents.

Irreversible causes.—Certain causes of malnutrition may be irreversible. Palliative care, including orexigenic drugs, enteral or parenteral feeding, consistent with the resident's wishes, should be considered (53).

SUMMARY

A structured approach to the management of unintended weight loss or malnutrition in long-term care helps to facilitate a comprehensive resident evaluation. The *Clinical Guide to Prevent and Manage Malnutrition in Long-Term Care* is based on a best-evidence approach to the management of nutritional problems in long-term care. While the Clinical Guide is presented in a linear fashion, many of the considerations can be done simultaneously and the order varied dependent on the individual resident's needs.

Further research to validate the effectiveness of using the algorithm in long-term care settings will be required. Prospective evaluation of outcomes using the Clinical Guide will be necessary to validate improvement in nutritional care and document its usefulness.

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Appendix A Geriatric Depression Scale (Short Form)

Answers indicating depression are highlighted.
Each bold answer counts as 1 point; scores greater than 5 indicate probable depression.

Yes No		Yes No	
1. Are you basically satisfied with your life?	yes / no	9. Do you prefer to stay at home, rather than going out and doing new things?	yes / no
2. Have you dropped many of your activities and interests?	yes / no	10. Do you feel you have more problems with memory than most?	yes / no
3. Do you feel that your life is empty?	yes / no	11. Do you think it is wonderful to be alive?	yes / no
4. Do you often get bored?	yes / no	12. Do you feel pretty worthless the way you are now?	yes / no
5. Are you in good spirits most of the time?	yes / no	13. Do you feel full of energy?	yes / no
6. Are you afraid that something bad is going to happen to you?	yes / no	14. Do you feel that your situation is hopeless?	yes / no
7. Do you feel happy most of the time?	yes / no	15. Do you think that most people are better off than you are?	yes / no
8. Do you often feel helpless?	yes / no		

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Appendix B Cornell Scale for Depression in Dementia

Rating should be based on symptoms and signs occurring during the week before interview.

No score should be given if symptoms result from physical disability or illness.

Scoring system: a=Unable to evaluate 0=Absent 1=Mild to intermittent 2=Severe

A. Mood-Related Signs

- | | | | | |
|---|---|---|---|--|
| a | 0 | 1 | 2 | 1. Anxiety: anxious expression, rumination, worrying |
| a | 0 | 1 | 2 | 2. Sadness: sad expression, sad voice, tearfulness |
| a | 0 | 1 | 2 | 3. Lack of reaction to present events |
| a | 0 | 1 | 2 | 4. Irritability: annoyed, short tempered |

B. Behavioral Disturbance

- | | | | | |
|---|---|---|---|--|
| a | 0 | 1 | 2 | 5. Agitation: restlessness, hand wringing, hair pulling |
| a | 0 | 1 | 2 | 6. Retardation: slow movements, slow speech, slow reactions |
| a | 0 | 1 | 2 | 7. Multiple physical complaints (score 0 if gastrointestinal symptoms only) |
| a | 0 | 1 | 2 | 8. Loss of interest: less involved in usual activities (score only if change occurred acutely, i.e., in less than one month) |

C. Physical Signs

- | | | | | |
|---|---|---|---|---|
| a | 0 | 1 | 2 | 9. Appetite loss: eating less than usual |
| a | 0 | 1 | 2 | 10. Weight loss (score 2 if greater than 5 pounds in one month) |
| a | 0 | 1 | 2 | 11. Lack of energy: fatigues easily, unable to sustain activities |

D. Cyclic Functions

- | | | | | |
|---|---|---|---|---|
| a | 0 | 1 | 2 | 12. Diurnal variation of mood: symptoms worse in the morning |
| a | 0 | 1 | 2 | 13. Difficulty falling asleep: later than usual for this individual |
| a | 0 | 1 | 2 | 14. Multiple awakening during sleep |
| a | 0 | 1 | 2 | 15. Early morning awakening: earlier than usual for this individual |

E. Ideational Disturbance

- | | | | | |
|---|---|---|---|---|
| a | 0 | 1 | 2 | 16. Suicidal: feels life is not worth living |
| a | 0 | 1 | 2 | 17. Poor self-esteem: self-blame, self-depreciation, feeling of failure |
| a | 0 | 1 | 2 | 18. Pessimism: anticipation of the worst |
| a | 0 | 1 | 2 | 19. Mood congruent delusions: delusions of poverty, illness or loss |

SCORE ____ Score greater than 12 is Probable Depression

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Figure 4.

Members Representing the American Dietetic Association: Ann Gallagher, RD, LD; and Gretchen E. Robinson, MS, RD, LD, FADA.

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Address correspondence to David R. Thomas, MD, Division of Geriatric Medicine, Saint Louis University School of Medicine, 1402 S. Grand Boulevard, M238, St. Louis, MO 63104. E-mail: thomasdr@slu.edu

REFERENCES

- Silver AJ, Morley JE, Strome LS, Jones D, Vickers L. Nutritional status in an academic nursing home. *J Am Geriatr Soc.* 1988;36:487-491.
- Shaver HJ, Loper JA, Lutes RA. Nutritional status of nursing home patients. *J Parenter Enteral Nutr.* 1980;4:367-370.
- Thomas DR, Verdery RB, Gardner L, Kant AK, Lindsay J. A prospective study of outcome from protein-energy malnutrition in nursing home residents. *J Parenter Enteral Nutr.* 1991;15:400-404.
- Larsson J, Unosson M, Ek A-C, Nilsson L, Thorslund S, Bjurulf P. Effect of dietary supplement on nutritional status and clinical outcome in 501 geriatric patients—a randomized study. *Clin Nutr.* 1990;9:179-184.
- Dempsey DT, Mullen JL, Buzby GP. The link between nutritional status and clinical outcome: can nutritional intervention modify it? *Am J Clin Nutr.* 1988;47(2 suppl):352-356.
- Thompson MP, Merria LK. Unexplained weight loss in ambulatory elderly. *J Am Geriatr Soc.* 1991;39:497-500.
- Morley JE, Thomas DR. Anorexia and aging: pathophysiology. *Nutrition.* 1999;15:499-503.
- Morley JE. Anorexia in older persons: epidemiology and optimal treatment. *Drugs Aging.* 1996;8:134-156.
- Omran ML, Morley JE. Assessment of protein energy malnutrition in older persons, Part 1: History, examination, body composition, and screen tools. *Nutrition.* 2000;16:50-63.
- Council for Nutritional Clinical Strategies in Long-Term Care. *Anorexia in the Elderly.* Plainsboro, NJ: Multimedia Health Care/Freedom LLC; 1999.
- Galanos AN, Pieper CF, Kussin PS, et al. Relationship of body mass index to subsequent mortality among seriously ill hospitalized patients. *Crit Care Med.* 1997;25:1962-1968.
- Calle EE, Thun MJ, Petrelli JM, Rodriguez C, Heath CW Jr. Body-mass index and mortality in a prospective cohort of U.S. adults. *N Engl J Med.* 1999;341:1097-1105.
- Tayback M, Kumanyika S, Chee E. Body weight as a risk factor in the elderly. *Arch Intern Med.* 1990;150:1065-1072.
- Chapman KM, Nelson RA. Loss of appetite: managing unwanted weight loss in the older patient. *Geriatrics.* 1994;49:54-59.
- Wright BA. Recent weight loss is related to short-term mortality in nursing homes. *J Gen Intern Med.* 1994;9:648-650.
- Wang SY, Fukagawa N, Hossain M, Ooi WL. Longitudinal weight changes, length of survival, and energy requirements of long-term care residents with dementia. *J Am Geriatr Soc.* 1997;45:1189-1195.
- Keller HH. Malnutrition in institutionalized elderly: how and why? *J Am Geriatr Soc.* 1993;41:1212-1218.
- Blaum CS, Fries BE, Fiatarone MA. Factors associated with low body mass index and weight loss in nursing home residents. *J Gerontol Med Sci.* 1995;50A:M162-M168.
- Chidester JC, Spangler AA. Fluid intake in the institutionalized elderly. *J Am Diet Assoc.* 1997;97:23-28.
- Food and Nutrition Board. *Recommended Dietary Allowances.* 10th ed. Washington, DC: National Academy Press; 1989.
- Chernoff R. Meeting the nutritional needs of the elderly in the institutional setting. *Nutr Rev.* 1994;52:132-136.
- Skipper A. Monitoring and complications of enteral feeding. In: Skipper A, ed. *Dietitian's Handbook of Enteral and Parenteral Nutrition.* Rockville, MD: Aspen Publishers; 1993:298.
- McGee S, Abernethy W III, Simel DL. Is this patient hypovolemic? *JAMA.* 1999;281:1022-1029.
- Lindeman RD, Romero LJ, Liang HC, Baumgartner RN, Koehler KM, Garry PJ. Do elderly persons need to be encouraged to drink more fluids? *J Gerontol Med Sci.* 2000;55A:M361-M365.
- Morley J. Water, water everywhere and not a drop to drink. *J Gerontol Med Sci.* 2000;55A:M359-M360.
- Rudman D, Feller AG, Nagraj HS, Jackson DL, Rudman IW, Mattson DE. Relation of serum albumin concentration to death rate in nursing home men. *J Parenter Enteral Nutr.* 1987;11:360-363.
- Grant MD, Piotrowski ZH, Miles TP. Declining cholesterol and mortality in a sample of older nursing home residents. *J Am Geriatr Soc.* 1996;44:31-36.
- Frisoni GB, Franzoni S, Rozzini R, Ferrucci L, Boffelli S, Trabucchi M. A nutritional index predicting mortality in the nursing home. *J Am Geriatr Soc.* 1994;42:1167-1172.
- Buckler DA, Kelber ST, Goodwin JS. The use of dietary restrictions in malnourished nursing home patients. *J Am Geriatr Soc.* 1994;42:1100-1102.
- Hotaling DL. Nutritional considerations for the pureed diet texture in dysphagic elderly. *Dysphagia.* 1992;7:81-85.
- Johnson RM, Smicklas-Wright H, Soucy IM, Rizzo JA. Nutrient intake of nursing home residents receiving pureed foods or a regular diet. *J Am Geriatr Soc.* 1995;43:344-348.
- Kayser-Jones J. Mealtime in nursing homes: the importance of individualized care. *J Gerontol Nurs.* 1996;22:26-31.
- Siebens H, Trupe E, Siebens A, et al. Correlates and consequences of eating dependency in institutionalized elderly. *J Am Geriatr Soc.* 1986;34:192-198.
- Pick N, McDonald A, Bennett N, et al. Pulmonary aspiration in a long-term care setting: clinical and laboratory observations and an analysis of risk factors. *J Am Geriatr Soc.* 1996;44:763-768.
- Holzappel SK, Ramirez RF, Layton MS, Smith IW, Sagl-Massey K, DuBose JZ. Feeder position and food and fluid consumed by nursing home residents. *J Gerontol Nurs.* 1996;22:6-12.
- Gants R. Detection and correction of underweight problems in nursing home residents. *J Gerontol Nurs.* 1997;23:26-31.
- Dawe D, Moore-Orr R. Long-intensity range of motion exercise: invaluable nursing care for elderly patients. *J Adv Nurs.* 1995;21:675-681.
- Ruuskanen JM, Ruoppila I. Physical activity and physiologic well being among people 65-84 years. *Age Ageing.* 1995;24:292-296.
- Fiatarone MA, Marks EC, Ryan ND, et al. High-intensity training in nonagenarians: effects on skeletal muscle. *JAMA.* 1990;263:3029-3034.
- Johnson LE, Dooley PA, Gleick JB. Oral nutritional supplement use in elderly nursing home patients. *J Am Geriatr Soc.* 1993;41:947-952.
- Elmstahl S, Steen B. Hospital nutrition in geriatric long-term care medicine: II. Effects of dietary supplements. *Age Ageing.* 1987;16:73-80.
- Mitchell SL, Kiely DK, Lipsitz LA. Does artificial enteral nutrition prolong the survival of institutionalized elders with chewing and swallowing problems? *J Gerontol Med Sci.* 1998;53A:M207-M213.
- Morley JE, Silver AJ. Nutritional issues in nursing home care. *Ann Intern Med.* 1995;123:850-859.
- Morley JE, Kraenzle D. Causes of weight loss in a community nursing home. *J Am Geriatr Soc.* 1994;42:583-585.
- Yesavage JA. Geriatric Depression Scale. *Psychopharmacol Bull.* 1988;24:709-711.
- Sheikh J, Yesavage J. Geriatric Depression Scale: recent evidence and development of a shorter version. *Clin Gerontol.* 1986;5:165-173.
- Lewis CW, Frongillo EA Jr, Roe DA. Drug-nutrient interactions in three long-term-care facilities. *J Am Diet Assoc.* 1995;95:309-315.
- Volicer L, Stelly M, Morris J, McLaughlin J, Volicer BJ. Effects of dronabinol on anorexia and disturbed behavior in patients with Alzheimer's disease. *Int J Geriatr Psychiatry.* 1997;12:913-919.
- Kardinal CG, Loprinzi CL, Schaid DJ, et al. Controlled trial of cyproheptadine in cancer patients with anorexia and/or cachexia. *Cancer.* 1990;65:2657-2662.
- Simons JP, Aaronson NK, Vansteenkiste JF, ten Velde GP. Effects of medroxyprogesterone acetate on appetite, weight and quality of life in advance-stage non-hormone-sensitive cancer: a placebo-controlled multicenter study. *J Clin Oncol.* 1996;14:1077-1084.
- Fietau R, Riepl M, Kettner H, et al. Supportive use of megestrol acetate in patients with head and neck cancer during radio/chemotherapy. *Eur J Cancer.* 1997;33:75-79.
- Yeh SS, Wu SY, Lee TP, et al. Improvement in quality-of-life measures and stimulation of weight gain after treatment with megestrol acetate oral suspension in geriatric cachexia: results of a double-blind, placebo-controlled study. *J Am Geriatr Soc.* 2000;48:485-492.
- McCann RM, Hall WJ, Groth-Juncker A. Comfort care for terminally ill patients. The appropriate use of nutrition and hydration. *JAMA.* 1994;272:1263-1266.

54. Shaver HJ, Loper JA, Lutes RA. Nutritional status of nursing home patients. *J Parenter Enteral Nutr.* 1980;4:367-370.
55. Pinchocofsky-Devin GD, Kaminski MV. Incidence of protein calorie malnutrition in the nursing home population. *J Am Coll Nutr.* 1987;6:109-112.
56. Larsson J, Unosson M, Ek A-C, Nilsson L, Thorslund S, Bjurulf P. Effect of dietary supplement on nutritional status and clinical outcome in 501 geriatric patients—a randomized study. *Clin Nutr.* 1990;9:179-184.
57. Nelson KJ, Coulston AM, Sucher KP, Tseng RY. Prevalence of malnutrition in the elderly admitted to long-term-care facilities. *J Am Diet Assoc.* 1993;93:459-461.
58. Wright BA. Weight loss and weight gain in a nursing home: a prospective study. *Geriatr Nurs.* 1993;14(3):156-159.
59. Abbasi AA, Rudman D. Observations on the prevalence of protein-calorie undernutrition in VA nursing homes. *J Am Geriatr Soc.* 1993;41:117-121.
60. Bistran BR, Sherman M, Blackburn GL, Marshall R, Shaw C. Cellular immunity in adult marasmus. *Arch Intern Med.* 1977;137:1408-1411.
61. Weinsier RL, Hunker EM, Krumdieck CL, Butterworth CE Jr. Hospital malnutrition. A prospective evaluation of general medical patients during the course of hospitalization. *Am J Clin Nutr.* 1979;32:418-426.
62. Warnold I, Lundholm K. Clinical significance of preoperative nutritional status in 215 noncancer patients. *Ann Surg.* 1984;199:299-305.
63. Pinchocofsky-Devin GD, Kaminski MV. Correlation of pressure sores and nutritional status. *J Am Geriatr Soc.* 1986;34:435-440.
64. Detsky AS, Baker JP, O'Rourke K, Johnston N, Whitwell J, Mendelson RA, Jeejeebhoy KN. Predicting nutrition-associated complications for patients undergoing gastrointestinal surgery. *J Parenter Enteral Nutr.* 1987;11:440-446.
65. Dwyer JT, Coleman KA, Krall E, Yang GA, Scanlan M, Galper L, Winthrop E, Sullivan P. Changes in relative weight among institutionalized elderly adults. *J Gerontol.* 1987;42:246-251.
66. Windsor JA, Hill GL. Weight loss with physiologic impairment. A basic indicator of surgical risk. *Ann Surg.* 1988;207:290-296.
67. Berlowitz DR, Wilking SVB. Risk factors for pressure sore: a comparison of cross-sectional and cohort-derived data. *J Am Geriatr Soc.* 1989;37:1043-1050.
68. Chang JI, Katz PR, Ambrose P. Weight loss in nursing home patients: prognostic implications. *J Fam Pract.* 1990;30:671-674.
69. Brandeis GH, Morris JN, Nash DJ, Lipsitz LA. Epidemiology and natural history of pressure ulcers in elderly nursing home residents. *JAMA.* 1990;264:2905-2909.
70. Thomas DR, Verdery RB, Gardner L, Kant AK, Lindsay J. A prospective study of outcome from protein-energy malnutrition in nursing home residents. *J Parenter Enteral Nutr.* 1991;15:400-404.
71. Windsor JA. Underweight patients and the risk of major surgery. *World J Surg.* 1993;17:165-172.
72. Murden RA, Ainslie NK. Recent weight loss is related to short-term mortality in nursing homes. *J Gen Intern Med.* 1994;9:648-650.
73. Kaiser FE, Morley JE. Idiopathic CD4+ lymphopenia in older persons. *J Am Geriatr Soc.* 1994;42:1291-1294.
74. Franzoni S, Frisoni GB, Boffelli S, Rozzini R, Trabucchi M. Good nutritional oral intake is associated with equal survival in demented and nondemented very old patients. *J Am Geriatr Soc.* 1996;44:1366-1370.
75. Berkhout AM, van Houwelingen JC, Cools HJ. Increased chance of dying among nursing home patients with lower body weight. *Ned Tijdsch Geneesk.* 1997;141:2184-2188.
76. Flacker JM, Kiely DK. A practical approach to identifying mortality-related factors in established long-term care residents. *J Am Geriatr Soc.* 1998;46:1012-1015.
77. Gambassi G, Landi F, Lapane KL, Sgadari A, Mor V, Bernabei R. Predictors of mortality in patients with Alzheimer's disease living in nursing homes. *J Neurol Neurosurg Psychiatry.* 1999;67:59-65.
78. Perry HM III, Ali AS, Morley JE. The effect of weight loss on outcomes in a nursing home. *J Invest Med.* 1999;47:225A.
79. Sullivan DH, Sun S, Walls RC. Protein-energy undernutrition among elderly hospitalized patients: a prospective study. *JAMA.* 1999;281:2013-2019.

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