

A proposed model for effective nutrition care

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The American Dietetic Association formed the Health Services Research (HSR) Task Force in 1998 to explore research on the effectiveness and outcomes of medical nutrition therapy (MNT). The task force identified several barriers to the development of a body of research in this area including inadequate specification of the nutrition care process and the lack of common definitions for nutrition care and its outcomes. A subgroup was formed to develop a model of nutrition care and create a core set of outcome measures with operational definitions that could be used in outcomes research. The importance of this effort is underscored by other recent policy developments related to MNT.

In its study of Medicare beneficiaries, the Institute of Medicine noted that nutrition services are commonly provided as a part of a team approach to care, but the roles of various health care team members are infrequently defined. Further, the exact nature of nutrition care provided is often not described by researchers (1). After many years of work, MNT was approved for inclusion as a covered service by Medicare Part B. The legislation (HR 5661, Section 105) defined MNT services as "nutritional diagnostic, therapy, and counseling services for the purpose of disease management which are furnished by a registered dietitian or nutrition professional." (2) In another recent development, MNT codes were added to the American Medical Association's Current Procedural Terminology (CPT) 2001. (Figure 1) MNT is described as either initial assessment and intervention or reassessment and intervention in 15 minute sessions with an individual patient, or 30 minute group sessions (3).

These definitions fail to reflect the type, level, and complexity of nutrition care provided by dietetics personnel. If the profession is to move forward, expanding the body of evidence linking nutrition care to positive outcomes, a detailed model of the nutrition care process with standard definitions, including measurable outcomes, is necessary. The nutrition care model described here reflects the work of the HSR subgroup and is presented as a stimulus for discussion and debate about the

97802 Medical nutrition therapy; initial assessment and intervention, individual, face-to-face with the patient, each 15 minutes
 97803 Re-assessment and intervention, individual, face-to-face with the patient, each 15 minutes
 97804 Group (2 or more individual(s)), each 30 minutes

(For medical nutrition therapy assessment and/or intervention performed by a physician, see Evaluation and Management or Preventive Medicine service codes)

FIG. 1 Medical Nutrition Therapy CPT Codes
 (American Medical Association Current Procedural Terminology CPT 2001, pg. 300.)

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crucial aspects of nutrition care as a framework for standardized definitions of essential nutrition care processes and outcomes.

BACKGROUND

Gates and Meyer identified the need for development of an effective disease-specific nutrition care process in dietetics that articulated the relationship between data collection and care planning (4). Medical Nutrition Therapy Across the Continuum of Care (MNTACC) is an invaluable resource in defining the course of disease-specific nutrition therapy including the number of sessions; clinical, functional, and behavioral outcome assessment factors; documentation guidelines; and session process (5). However, MNTACC does not provide a conceptual model that addresses all the facets of the environment. Client-provider interaction and protocols have had varying degrees of validation (6).

Other allied health professions offer a parallel to our search for a clearly defined model of care. The nursing profession adopted a common "nursing process" in the 1960s that serves many functions (7). The nursing process is the core and essence of nursing; is central to all nursing actions; is applicable in any setting and within any theoretical conceptual reference; unifies, standardizes, and directs nursing practice; and forms the basis of documentation and continuity of care (8, 9). In 1970 the nursing diagnosis was officially recognized as an element of nursing practice (10). Mason and Mattree summarize the nursing process as a theory with five principal, interrelated components in a cyclical pattern: assessment, diagnosis, planning, implementing, and evaluating care (11). The nursing process model is complemented by conceptual models to fully describe nursing practice in political, educational, and clinical practice.

Both physical and occupational therapy also have explicit definitions of the care process. The *Guide to Physical Therapist Practice* identified five elements of patient/client management: examination, evaluation, diagnosis, prognosis (including plan of care) and intervention which lead to outcomes (12). Occupational therapy defines four elements: referral, evaluation, intervention/reevaluation, and discharge/follow-up (13).

DEVELOPMENT OF A MODEL FOR NUTRITION CARE

The HSR subgroup accepted the challenge of developing this model in 1999. The Nutrition Care Model represents a synthesis of the deliberations of approximately 40 registered dietitians and other health care professionals in five think tank sessions held in different locations (Boston, Kansas City, Los Angeles, and Minneapolis) or by conference call (including Department of Defense personnel in several states).

Participating were six to ten "forward-thinkers" with a depth of experience in nutrition care delivery, education or research. Through facilitated discussions lasting three to six hours, they answered a series of questions: "What precisely is nutrition care in therapeutic settings?" "What activities are essential to produce behavior change and other outcomes?" "How can this

nutrition care be represented in a theoretical or conceptual model?" "What other things are essential to support the model?" They were also asked to formulate definitions for crucial elements of the model and for nutrition care outcomes. The work produced by the five groups was synthesized into a single model and narrative description and sent back to participants for review. Respondents (n=15) affirmed that the components of the Nutrition Care Model (Figure 3) incorporated their group's views and accurately presented what a dietitian does or should do in the nutrition care process. Nutrition care described in the model could be expected to produce positive outcomes for most patients/clients, providing that the dietitian has adequate skill and the content of care (nutrition care plan and follow up) incorporated practice guidelines or best practices for the condition or disease, and was tailored to the unique circumstances of the patient/client.

The Nutrition Care Model describes nutrition care as it is commonly delivered in health care settings in the United States. It is a generalized representation of direct nutrition care provided by registered dietitians to patients/clients that is applicable in all health care settings (hospitals and rehabilitation facilities, outpatient clinics, long-term care facilities, and home care) and all systems (eg, managed care organizations and fee-for-service). It presents the essential components of effective direct nutrition care and identifies factors that impact this process and its outcomes. The components identified in the model are believed to be necessary and sufficient—meaning that all must be in place in a given setting and provided according to current guidelines for practice before nutrition care can be expected to show effectiveness over the long run. The model does not include indirect nutrition interventions such as social marketing campaigns (eg, "5-A-Day for Better Health" campaign), but it does include prevention and health promotion when provided directly to clients.

The model assumes nutrition care is a component of comprehensive health care and is coordinated with other providers in the same or other institutions. While other providers can and sometimes do follow this nutrition care process, the model recognizes the unique and specialized training of registered dietitians in food and nutrition, and as translators of metabolic nutrient needs into individualized plans for nutrition support and/or guidance for food-related behaviors and eating patterns.

NUTRITION CARE MODEL

The Nutrition Care Model has three components (Figure 3):

- **Trigger Event** identifies where and how the patient/client is identified as an appropriate candidate for nutrition care.
- **Nutrition Care Process** specifies the cycle of essential components of effective nutrition care.
- **Nutrition-Related Outcomes** lists the most likely areas to observe results produced by or influenced by nutrition care.

I. Trigger Event A trigger event initiates a nutrition referral or consult and scheduling for contact with a registered dietitian. The trigger or initiating event can happen either during a general health or disease-focused screening. This recognizes that a nutrition-related need can be identified as a potential or early risk factor or as a complicating or underlying factor related to an existing medical condition or disease. The nutrition problem or risk can be identified by health care providers in the course of care, as a part of routine health screening, or by patients/clients themselves. In disease-focused screening,

nutrition problems can be a cause or a result of the disease or condition, and they can have a physiologic or behavioral etiology.

Screening may be done by dietetic professionals, but it is more often done by physicians, nurses, and others in health care settings, or through community-based screenings such as worksite health risk appraisal, health fairs, and at schools and food assistance programs.

The trigger event is included in the model because it is the access point for referral to nutrition care. Attention to trigger events is useful for evaluating access and determining the timing and appropriateness of referral to nutrition care. It also enables tracking the prevalence and incidence of nutrition-related risk factors and problems in a population.

As shown at the bottom of the model, access to appropriate nutrition care can be enabled by policies and procedures and limited or constrained by payor coverage.

II. Nutrition Care Process The Nutrition Care Process includes the clinical tasks of MNT. This is the part of the model that should routinely be provided by registered dietitians. It involves direct interaction between the dietetic professional and the patient/client, and has as its goal optimization of nutritional status, health and well being according to the individual's needs.

The Nutrition Care Process had five essential steps (Figure 4):

- Assess
 - Establish Goals and Determine Nutrition Plan
 - Implement Intervention
 - Document and Communicate
 - Evaluate and Reassess
- The first four steps occur at every patient contact; and the fifth one happens at follow-up visits.

"Assess" explores indicators of nutritional risk, and patient/client strengths and obstacles are examined. It includes identification of problems, their severity, urgency and underlying causes, and a determination of correctable problems or underlying causes. Much attention has been given to assessment methods at the patient and population level. However, standard definitions for nutrition care goals and intervention alternatives are not as well developed.

Think tank participants identified several intervention approaches used depending on assessment findings.

- modifying macro- or micronutrient composition, consistency, or flavor;
- prescribing/specifying food and nutrient intake;
- translating nutrition prescriptions into meals plans, food choices, preparation techniques, etc;
- fostering behavior change by educating, counseling, motivating, and advising;
- providing complete or supplemental nutrients through food or enteral or parenteral formula; and
- referring to other service providers.

They also identified alternative means for delivering the intervention that are used alone or in combination (Figure 2). Imbedded in these delivery channels are the application of specific counseling methods, teaching strategies, and behavior change theories and methods. Appropriate selection and proficient use of methods that facilitate behavior change is an essential element in the success of any delivery approach. While usually not measured or documented, the counseling, teaching, and behavior change expertise of the dietetics professional is crucial for effective nutrition care.

- Individual, one-to-one
- Group
- Class
- Telephone
- Fax, e-mail
- Self-study materials
 - print materials (pamphlets, workbooks, etc)
 - video and audio tapes
 - computer (Web sites, CD-ROM, software programs)

FIG 2. Ways of Delivering Nutrition Intervention

It is widely believed that effectiveness of the nutrition care process requires rapport between patient and provider, and tailoring or individualizing the care plan to the patient/client needs and preferences. "Factors Affecting Effectiveness of Nutrition Care Process" (connected to "Nutrition Care Process" in the model) underscores that the relationship between the patient/client and provider is key to achieving effectiveness.

Coordination with other aspects of health care delivery is important for reinforcement of the nutrition plan by other team members. This recognizes the synergistic effect of nutrition and other aspects of medical management on achievement of outcomes. Coordination requires communication and documentation. Documentation establishes a record of the nutrition care process and may occur throughout the steps of providing nutrition care. It is important for linking assessment findings with goals and intervention strategies. It is used to determine quality of care provided as well as to measure and evaluate nutrition care and its outcomes. Thus, "Document and Communicate" is identified as a separate and essential component of the nutrition care process.

The crucial role of follow-up contacts for achieving and maintaining behavior change underscores the importance of more than one visit for effective nutrition care. One or more follow-up visits are also necessary for evaluating progress, adjusting plans and intervention strategies, and providing reinforcement. Successive visits are represented as "Continuation of Nutrition Care" at the top of the model and make up the essential component of "Evaluation and Reassessment."

Patients can decide not to enter or continue recommended or planned nutrition care; and their self-management behaviors ultimately determine the outcomes. These points are also captured in the nutrition care model.

III. Nutrition-Related Outcomes The third part of the Nutrition Care Model places attention on the results produced by nutrition care. The nutrition care process should be focused on relevant goals; and its success or effectiveness depends on achieving desired outcomes. Desired outcomes can be specified at several levels—individual patient/client, patient population, institution, and health system. Outcomes can be disease-specific and be identified as a part of clinical pathways/critical care maps, MNT protocols, and clinical practice guidelines. Outcomes can also be health status goals defined in general terms.

Figure 5 shows four categories of outcomes—patient-centered outcomes, direct nutrition outcomes, clinical outcomes (that can include primary, secondary, and tertiary prevention aims), and health care utilization/cost saving outcomes. Impact on clinical outcomes has been and remains an important indicator of effectiveness, and outcomes with cost implications are important to many. "Direct Nutrition Outcomes" recognizes the behavioral change emphasis of nutrition care, and the

fact that these outcomes can be important intervening steps toward clinical outcomes. The inclusion of patient-centered outcomes is important for measuring the patient's perspective. While outcomes are measured at the individual level they are usually reported in aggregate by patient population, program, institution/organization, or health system.

More work is planned to specify and define a core set of disease-specific and general outcome measures that are linked to nutrition care. Measures must be accurately measured, routinely documented and tracked in record systems at the patient, institution, and health system levels.

Comparison to Nursing Profession

Like nursing, the proposed nutrition care model is a problem-solving approach; however, nursing puts greater emphasis on diagnosis. A wide range of nursing diagnoses have been articulated and described (14). Frauman and Skelly evaluated various models of diagnostic reasoning or clinical decision-making as they explored effective ways to describe advanced nursing practice (15).

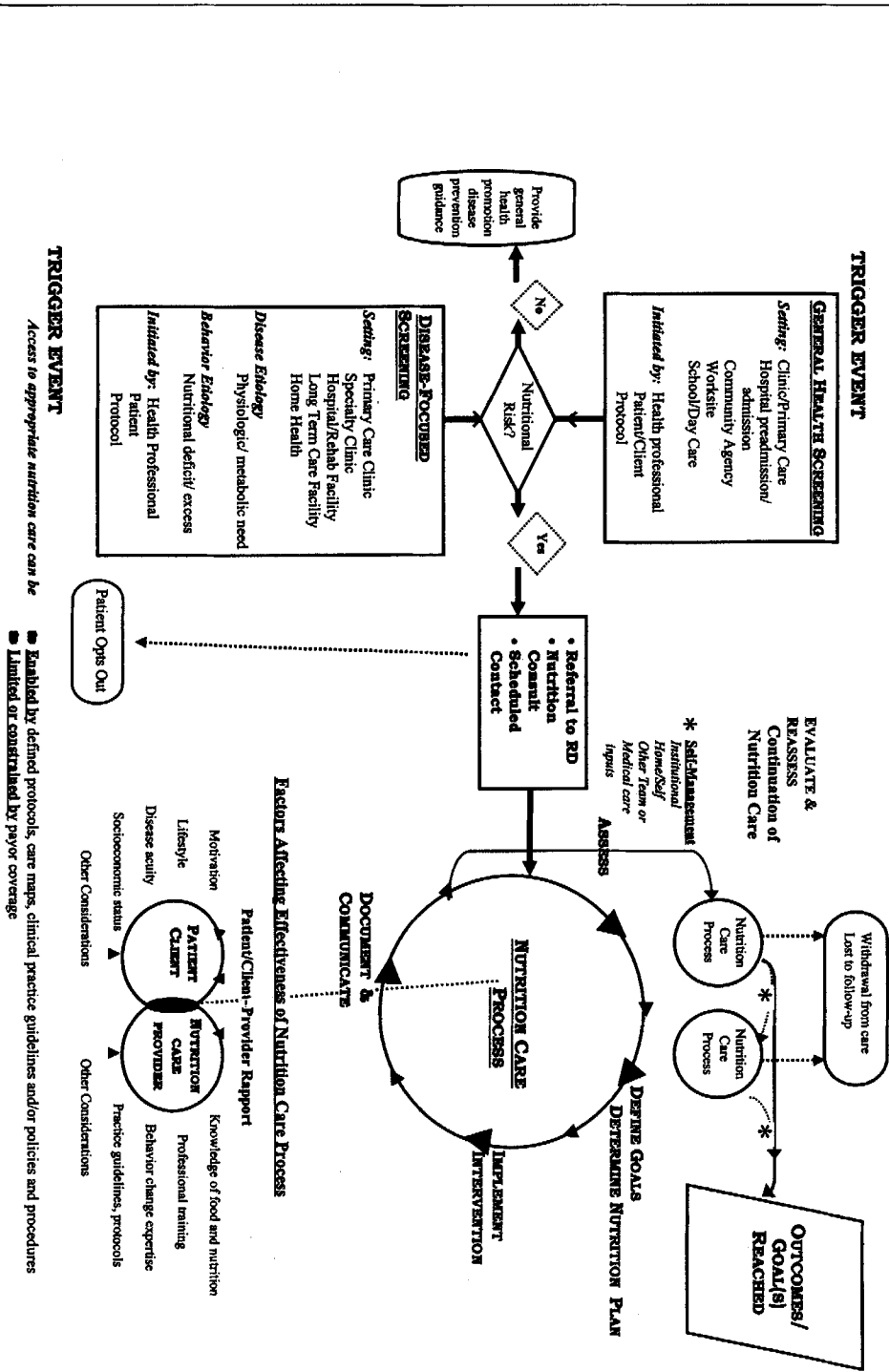
Some critics of the nursing process assert that it is a nurse-focused process based on natural science and should instead be modified to address the human science view. Lindsey and Hartrick suggest that disease care models are not sufficient to address the needs of professionals who must actively engage the client in the process of obtaining health (16). Hartrick et al identified a new framework that included four components: listening to the client; participatory dialogue; pattern recognition; and envisioning action and positive change (17). Redman identifies the need to more adequately address the longitudinal focus on learning over the course of chronic disease, identifying standard description of teaching intervention, and conceptualizing patient education on a continuum from knowledge to behavior change (18).

Mason and Mattree suggest that research is necessary to explore the relationship between nursing art, nursing science, and nursing processes. Research needs to address clinical practice as well as education (11).

DISCUSSION

The original purpose of the Nutrition Care Model was to circumscribe a framework for nutrition care so that a standard set of core nutrition care measures could be developed. A core set of measures could lead to uniform documentation of nutrition care services, enable differentiation of the type and amount of nutrition care provided, and provide a basis for linking nutrition care activities with actual or predicted outcomes. Core measures, defined in standard, unambiguous terms, could then be recommended for adoption by nutrition care providers, medical record systems, administrative data sets, health services data systems, and payment/reimbursement systems, as well as researchers.

This model is also useful in interpreting what constitutes MNT to other health care providers. It provides a visible depiction of why simply providing a brochure at the conclusion of an office visit will unlikely produce the desired clinical and other outcomes. This model can be useful when comparing nutrition services provided by others with MNT provided by registered dietitians (1). For example, the interactive nature of the client/provider as depicted in the model may illustrate the similarities with the psychology profession and identify the departure from more procedural types of allied health professions such as laboratory or radiology.



TRIGGER EVENT
 Access to appropriate nutrition care can be

- Enabled by defined protocols, care maps, clinical practice guidelines and/or policies and procedures
- Limited or constrained by payor coverage

FIG 3. Nutrition Care Model

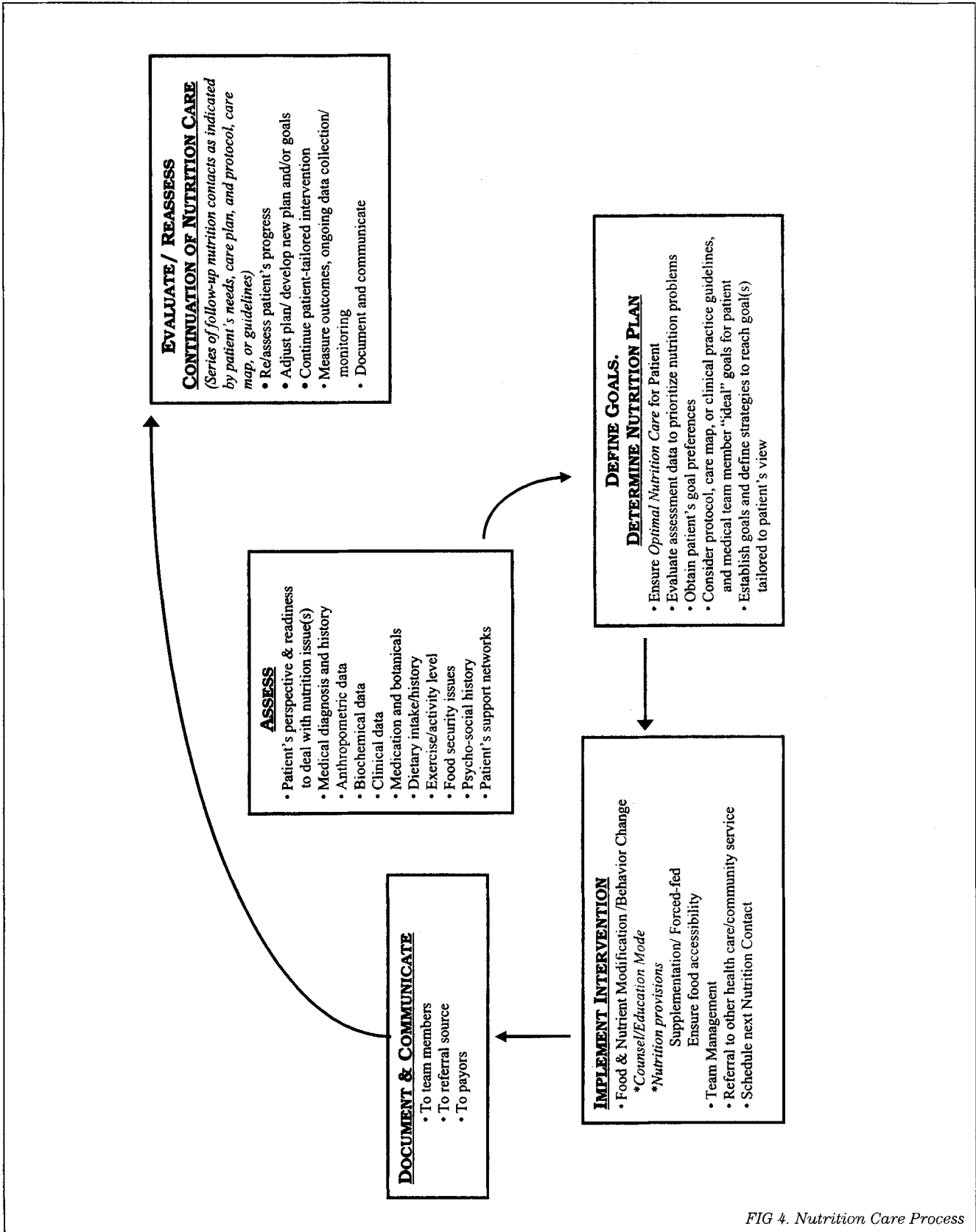


FIG 4. Nutrition Care Process

Patient/Client-centered Outcomes
Patient Value-based Care
■ Quality of life
■ Patient satisfaction
■ Self-efficacy
■ Self-management
■ Functional ability
Direct Nutrition Outcomes
■ Knowledge gained
■ Behavior change
■ Food & nutrient intake improvement
■ Improved nutritional status
Clinical & Health Status Outcomes
Primary, Secondary, Tertiary Prevention
■ Lab values, weight, blood pressure
■ Risk factor profile changes
■ Disease signs & symptoms
■ Improved clinical status
Healthcare Utilization/Cost Savings
■ Prevent or delay complications
■ Medication changes
■ Number of unplanned clinic visits
■ Number of preventable hospital admissions
■ Length of hospitalization
■ Prevent or delay nursing home admission

FIG 5. Outcomes/Goals: "Measure & Document"

Professional Issues

The assessment portion of the model as developed by think tank participants did not mention conducting a comprehensive anatomical "nutritional review of systems" (eg, constitutional, eyes, ears, nose, mouth and throat, cardiovascular, respiratory, gastrointestinal, genitourinary, musculoskeletal, integumentary, neurological, psychiatric, endocrine, hematologic/lymphatic, and allergic/immunological) as proposed by Albarado (19). This type of assessment and documentation may be necessary to reflect the complexity of nutrition problem solving and intervention planning for billing and reimbursement purposes.

Kight postulated that nutritional diagnoses were needed and the routine process of nutrition care should include the additional step of synthesizing the assessment data evaluation into a diagnostic statement (20). Her work identified 74 nutritional diagnoses that could be used to identify the explicit nature of the nutrition problem to be treated. Recently the Diagnostic Nutrition Care Group model has been expanded from five steps to nine steps (21). The inclusion of explicit nutrition diagnoses would parallel the nursing diagnoses, diagnostic reasoning and clinical decision-making process. It would also be consistent with ADA's Standards of Education requirement to develop critical thinking skills (22).

Kiy proposed that dietitians are moving from "teaching" to focusing on the client-centered model that encompasses principles of dietetics, mental health counseling, and education (23). Schiller et al reinforced this client-centered focus and suggested that this new approach would emphasize partnering with the client, require multiple session, promote client independence and incorporate personal issues (24).

Implications for Policy and Reimbursement

This model could be valuable as the Health Care Finance Administration develops rules and regulations for provision of MNT, its documentation, and Medicare reimbursement. As more dietitians seek reimbursement for MNT, having a clear definition of care that meets the intent of the CPT codes is

critical. CPT codes are linked to the number of minutes spent in contact with the client for initial assessment and treatment or reassessment and treatment, as well as to type of intervention (group or individual). The multiple steps in the nutrition care process are considered as a whole by the CPT definitions. Each cycle of nutrition care can generate a billing. The model can help practitioners visualize what documentation will be necessary to justify the number and length of visits requested and provided. While the complexity of problems dealt with during assessment, decision-making and intervention are important for projecting outcomes, CPT codes do not differentiate among levels of complexity.

Practitioner Applications

Practitioners establishing or evaluating their practice can use the model to identify where they need to focus efforts. If the screening or referral process is not adequately addressed, they will be unable to anticipate the volume of clients. If initial scheduling is a barrier or patients are unable to make or keep follow-up appointments, the impact of these problems on clinical outcomes can be evaluated and reported. Evaluation can help determine if certain patient or provider factors are barriers to successful intervention. Once barriers are identified, changes can be made. The model accounts for patient decisions and identifies self-management as an important factor. The model also helps identify relevant outcome measures to use in determining effectiveness.

As proposed by Gates and Meyer, the nutrition care process needs to be adapted to disease-specific aspects of nutrition care (4). The model provides an ideal framework for inserting disease-specific aspects into screening, nutrition care process, number of nutrition care cycles and outcomes to be achieved. The disease-specific MNTACC protocols are an excellent resource for specifying decisions to the specific disease (5).

Practitioners have expressed concern about the difficulty collecting outcomes when patients cannot or do not keep return appointments. This model enables identification of patients for whom continuing care is recommended but who withdraw from care. When this is documented, its impact on overall outcomes can be evaluated.

Dietetics Education Applications

Dietetics educators may find the comprehensive model useful in teaching about nutrition care from the initiating event, to referral, through cycles of the nutrition care process and the measurement of outcomes. The model places MNT into a larger context of operational issues that affect access to care and follow-up. Even within short rotations, supervised practice programs can help students anticipate the patient's next session, appropriately plan the intervention to encompass multiple sessions, and consider the impact of the number and timing of contacts on the magnitude of change expected. The visual depiction of client/provider interface and recognition of factors that influence rapport can assist students and educators in assessing and developing effective counseling skills.

Research Applications

The Nutrition Care Model, supported by future work to identify and define a standard set of measures, can establish a framework for uniform measures that can be incorporated into outcomes research designs. It also provides the framework for formulating research questions about nutrition care and its outcomes. With standardized descriptions of nutrition care

and outcome measures, comparisons can be made between studies, and the synthesis of findings using meta-analysis will be facilitated. A critical gap to be filled by research is predicting which clients are likely to achieve desired nutrition outcomes, and how much improvement can be expected from different approaches to intervention or with additional investment of resources in nutrition services. Having a common model and standardized definitions can help close this gap. Another door opened by adoption of a nutrition care model with standardized descriptions and measures is the potential for inclusion of nutrition in national health care databases.

CONCLUSIONS

This nutrition care model is proposed as a starting point for discussion. Intriguing questions that might arise from the exploration of this model include:

- Should the dietetics profession officially adopt a common nutrition care process that can be uniformly included in curriculum, designing and reporting research, and used in practice?
- Does the proposed model reflect current or ideal practice? If this model is not reflective of current practice, what changes need to be made in the model or in practice? Will the model need to change as healthcare continues to evolve?
- Should we begin to create a body of research and literature articulating a conceptual model and a care process similar to what has occurred in the nursing profession?
- Is diagnosis a function of the dietetics professional? Should dietetics consider articulating and researching the step between gathering and assessing individual parameters and setting goals/determining nutrition care plan—the diagnostic reasoning/clinical decision-making as described in nursing literature?
- Can we research the relationship between the art of dietetics, the science, and the nutrition care process?
- How can we create a common language for nutrition research and practice to articulate the nature and complexity of the nutrition care, facilitate comparisons between studies, and predict outcomes?
- What are the implications for education, advanced practice certifications, and role delineation?

A healthy debate about the components and definitions of nutrition care can stimulate advances in dietetics practice, education and research. While this model will continue to evolve, it can serve as the basis for the next challenge—creating uniform outcome measures with operational definitions to use in dietetics

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This article does not necessarily reflect the views of the American Dietetic Association. This study was funded as part of the Health Services Research Task Force.

The authors thank Ann Coulston, MS, RD, FADA, Chris Biesemeier, MS, RD, FADA, and Elvira Johnson, MS, RD, who arranged focus groups, the think tank participants, and Anne Faricy, research assistant. Nadine Caputo, MS, was also instrumental in recognizing the value of this project.