Abstract

The Nutrition Care Process (NCP) provides registered dietitians (RDs) with a framework for critical thinking and decision making regardless of the practice setting. Nutrition support RDs can use the NCP to streamline and provide focus in identifying nutrition problems, determining the appropriate nutrition intervention, and evaluating the effectiveness of those interventions. Nutrition diagnosis facilitates communication between RDs and other health-care providers in describing the nutrition problems that the RD is responsible for treating independently. Use of the standardized terminology of dietetics in documenting the nutrition care provided allows aggregation of data from different care settings that can demonstrate outcomes achieved.

Introduction

The American Dietetic Association (ADA) adopted the NCP in 2003 to provide RDs with a framework for critical thinking and decision making in all practice settings (1). Nutrition support practice often involves complex, rapidly changing situations that require the clinician to have well-developed critical thinking skills and make immediate decisions that have far-reaching consequences. The NCP offers tools to the nutrition support RD that facilitate practice. This article reviews each component of the NCP as it relates to nutrition support practice, demonstrating how the nutrition support RD can use the NCP. Additionally, ADA’s standardized terminology for nutrition diagnosis and intervention are described briefly.

The Model

The NCP consists of the four steps at the center of the NCP model (Figure), but to use the NCP most effectively, the nutrition support RD should become familiar with the entire

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**Figure.** Nutrition Care Process Model.

[Image of the Nutrition Care Process Model]

model. Two components that are not part of the process are integral to successful implementation of the NCP: nutrition risk screening and outcomes management. Nutrition screening is the process that identifies patients, clients, or groups who would benefit from the services of the RD. Although it is important for the RD to be involved in development, implementation, and monitoring of a nutrition screening program (2), it is not necessary for the RD to conduct the screening. In many settings, health-care professionals other than RDs perform screening tasks. For example, in the acute care setting, where it has been recommended that patients needing nutrition assessment be identified in the first 24 hours following admission (3,4), nursing or other allied health personnel may perform the screen. Accordingly, screening may be positioned outside of, but contributing to, the NCP.

Outcomes management involves determination of the effectiveness of a health-care system and results associated with its function. Data on the performance of multiple departments may be collected and reported to regulatory agencies and third party payers. Because of its multidisciplinary focus, outcomes management is not considered to be an integral part of the NCP. As with screening, however, the RD should be involved in the process in conjunction with other professionals from nursing, medicine, respiratory therapy, and other departments.

The outermost ring of the NCP includes the external factors that affect the ability of the RD to provide care. These factors include the health-care setting, socioeconomic factors, social systems, and practice settings. The RD often has little to no control over these factors but must be cognizant of the impact they might have on care. For example, when recommending or initiating home nutrition support, the nutrition support RD must be aware of available home care services, payment systems, and patient's ability to manage a highly complex therapy at home.

The inner ring identifies the skills and knowledge of the individual RD. The nutrition support RD must possess a unique skill set and knowledge base above and beyond entry-level dietetics knowledge to provide nutrition care to a complex, often critically ill patient population. RDs at all practice levels must have skills in critical thinking, collaboration, communication, use of evidence-based practice, and knowledge of and adherence to the ADA Code of Ethics. The nutrition support RD must possess these skills at a level that allows practice in a complex environment caring for patients who may have multiple nutrition problems.

The nutrition support RD needs critical thinking skills to support constant adaptation to a rapidly changing care environment. Patients cared for by the nutrition support RD may be unstable and have more than one nutrition diagnosis identified on a given day or through the course of care. Critical thinking and decision-making skills are complex and difficult to teach or measure, yet they are vital for practice in this environment. Development and use of critical thinking skills have been studied in nursing and medical education (5–9), but less is known about how RDs employ critical thinking and decision-making skills in practice. Cognitive skills associated with critical thinking include interpretation of information, analysis of data, evaluation of expected outcomes, inference, explanation, and self-regulation (10).

More research is needed to determine the skill set needed by nutrition support RDs to support advanced critical thinking and decision-making skills (11), particularly because the NCP includes nutrition diagnosis.

Recent events in health care have led to a focus on the use of evidence-based medicine (EBM) (12). EBM has been defined as the process of finding, appraising, and using research findings as a basis for making decisions (13). Many EBM tools are available for the RD, including ADA’s Evidence Analysis Library (http://www.adaevidencelibrary.com), which includes evidence summaries, conclusion statements, and recommendations for practice. Nutrition support RDs must have the skills to identify their need to seek additional information, find evidence sources, and evaluate the information provided to determine if it is applicable to the current care event.

The Nutrition Care Process

Practicing RDs should be familiar with at least three of the four steps that comprise the NCP: nutrition assessment, intervention, and monitoring and evaluation. Prior to implementation of the NCP, RDs were responsible for assessing nutritional status, conducting an intervention, and monitoring the effectiveness of care. Nutrition diagnosis has not been taught in traditional dietetics education; it is a new skill for all practitioners.

Step One: Nutrition Assessment

Nutrition assessment can be defined as a systematic method to collect and evaluate information from a variety of sources that allows the RD to make a determination regarding nutrition status. The NCP provides the nutrition support RD with tools to focus data collection and evaluation of nutrition status. Although there are few evidence-based guidelines for nutrition assessment, the NCP identifies five categories of nutrition assessment data (Table 1). The nutrition support RD uses critical thinking skills to determine how much data from a given category is necessary to rule in or rule out a given nutrition diagnosis. Tools such as objective global assessment also provide a systematic framework for evaluating assessment data (15). Rolfe and Sanson-Fisher (16) postulate that the history and physical examination often provide more diagnostic information than test results. The nutrition support RD must be skilled in evaluation of results of medical tests, such as gastric emptying studies; performance and interpretation of nutrition-focused physical assessment; and evaluation of history and other factors that might affect safe provision of enteral and/or parenteral nutrition.

Step Two: Nutrition Diagnosis

Nutrition diagnosis is the component of the NCP that is most unfamiliar to RDs. In the past, RDs did not consider themselves as diagnosticians and did

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not develop the skills to identify a nutrition diagnosis. Nutrition diagnosis cannot be learned quickly or easily. Coderre and associates (17) described three strategies used by clinicians to elucidate a diagnosis: hypothetico-deductive reasoning, scheme-inductive reasoning, and pattern recognition. Hypothetico-deductive reasoning involves initial formation of a list of potential diagnoses based on early clues. Once this list is developed, the clinician seeks more information to confirm or delete each potential diagnosis (18). Clinicians at all experience levels may use this approach, but as more experience is gained, the amount of information needed to generate the first potential diagnosis is shortened and the list of potentials is also shorter. Scheme-inductive reasoning can be described as use of a conceptual framework supported by physiologic processes to arrive at a diagnosis (19). Pattern recognition is most effective when a disease or condition has signs and symptoms that are highly specific, easily recognized, and not easily forgotten. Because the clinician must have sufficient previous experience to categorize the signs and symptoms correctly, pattern recognition is most successful when used by expert clinicians.

Sackett and colleagues (18) added an algorithmic approach and the strategy of exhaustion as additional diagnostic methods. Others advocate use of the Bayes theorem in evaluating evidence to support a given diagnosis (20). Bayes theorem is a mathematical model that evaluates the probability that a given diagnosis is present. Regardless of the method used to elucidate the correct diagnosis, Rolfe and Sanson-Fisher suggested that students be exposed to a large number of clinical cases to develop needed diagnostic skills (16). No research currently evaluates the skills needed by RDs in the diagnostic process, but the experienced nutrition support RD logically would need the same skill set that other diagnosticians possess.

The nutrition diagnosis is described and documented using the P-E-S statement (Problem, Etiology, Signs/Symptoms). The P-E-S statement should be clear, concise, and meaningful. Using “inadequate infusion of enteral nutrition” (the problem or the nutrition diagnosis) as an example, a P-E-S statement is: “Inadequate infusion of enteral nutrition related to feedings held for presumed intolerance, as evidenced by intake records showing 66% of amount ordered infused over last 4 days.” Each component of the statement must be related, with the etiology (cause) guiding selection of an appropriate nutrition intervention, and the intervention designed to alleviate or remove the cause, thus improving the nutrition diagnosis. The signs/symptoms should be measurable so that the RD can quantify the outcome. In the previous example, the intervention might be to provide specific guidelines for holding feedings. If the intervention is successful, the signs and symptoms would show improved intake of feedings and progress to meeting requirements defined in the nutrition prescription.

**Step Three: Nutrition Intervention**

A nutrition intervention is a planned and purposeful action by the RD that is focused on ameliorating the cause of the nutrition diagnosis. The two components of the intervention are planning and implementation. The planning phase of the nutrition intervention involves prioritizing the diagnosis(es), searching for evidence to support the planned intervention, having a discussion with the client/patient and other health-care professionals as needed, determining the nutrition prescription, agreeing on outcome goals, and estimating the timing and frequency of interventions (14).

### Table 1. Categories of Nutrition Assessment Data (14)

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<th>Category</th>
<th>Definition</th>
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| Biochemical, medical tests and procedures | Laboratory data, including electrolytes, glucose, liver function, and lipid panels; medical tests, including gastric emptying and swallow evaluation | • Consider the costs and risks associated with blood draws  
• Prior to ordering biochemical tests, consider if the results will affect determination of the nutrition diagnosis |
| Anthropometric measurements             | Height, weight, body mass index, body fat, lean body mass, growth rate, weight change | • Weight change might be more specific than comparison of actual weight to standard  
• Critical thinking skills needed to evaluate weight in critical care |
| Physical examination findings           | Oral health, general appearance, skin changes, evaluation of functional status | • Requires additional training to evaluate physical examination findings fully |
| Client history                          | Nutrition, medical, medication, and social history                         | • Nutrition history is important part of assessment in all settings  
• Determine impact of medical history and current status on nutrition and ability to ingest and use nutrients |
includes not only the intervention itself, but also documentation, discussion, follow-up, and adjustments to the intervention plan as needed.

Nutrition support RDs may require an advanced set of skills in evaluation and management of patients receiving enteral and parenteral nutrition. The ability of the nutrition support RD to manage all aspects of care independently, including order writing and tube placement, varies, depending on the skills of the RD and facility or employer policy. In some settings, the RD can implement any of the nutrition interventions; in others, the RD must collaborate with others to ensure completion of the intervention.

**Step Four: Nutrition Monitoring and Evaluation**

The final step in the NCP is monitoring and evaluating the outcomes of a given course of action associated with a nutrition diagnosis. Outcomes indicators must be selected that accurately reflect the outcome of the service provided and are meaningful to those involved in the service. Although many clinicians use biochemical measures as indicators of adequacy of feeding, third-party payers might be more interested in decreased length of stay as an indicator of adequacy of nutrition. The nutrition support RD should evaluate proposed outcome measures carefully. Although surrogate indicators such as hepatic protein values have been used as outcomes indicators in the past, these measurements lack specificity for nutrition intervention and might provide erroneous information (21).

**The Standardized Terminology of Dietetics**

Standardized terminologies are used in health care to facilitate communication and share information. RDs might be familiar with some currently used terminologies such as the International Classification of Diseases (ICD) and Current Procedural Terminology (CPT). Adoption of standardized terminologies will become more important as electronic medical records are implemented. The Standardized Language/Nutrition Care Process Committee (SLC/NCP) of ADA has developed terms that define nutrition diagnoses and interventions (14), allowing RDs to describe and document nutrition problems and interventions. The terminology will be expanded in 2008 to include terms that describe monitoring and evaluation of care. There has been discussion between ADA and terminology experts in the informatics community to ensure incorporation of the ADA terminology into electronic health records.

**Use of the NCP and Standardized Language of Dietetics in Practice**

Nutrition support RDs must be able to assess nutrition status accurately, diagnose nutrition problems, and implement interventions in many different care settings, including critical care, long-term care, and home infusion. In the critical care setting, the RD must be able to assess nutritional status in the face of missing or altered data due to illness. It is important to be able to gather clues and generate hypotheses that lead to the correct nutrition diagnosis. Information about food and nutrition history often is missing or incomplete, necessitating aggregation of information from other information sources rather than waiting to obtain the history. An example is the need to feed a previously well-nourished (based on the nutrition physical examination) 25-year-old male who has multiple fractures and a traumatic brain injury. The skilled nutrition support RD evaluates the current situation and uses previous experience with similar patients as a guide and evidence-based guidelines and protocols to develop a plan of care. Depending on the situation, nutrition diagnoses that might apply include “inadequate oral food/beverage intake” if NPO status is prolonged, “hypermetabolism” if indirect calorimetry results demonstrate elevated resting metabolic rate compared to predicted, or “inadequate protein intake” if protein intake is not meeting increased needs following injury.

The nutrition support RD should identify a nutrition intervention for each diagnosis identified. With the previous example, the RD would consider an intervention that addresses the lack of intake while NPO and meets the elevated energy requirements resulting from hypermetabolism. The facility may have practice guidelines in place or the RD might need to seek guidelines to determine when and how to initiate feedings, how to re-evaluate energy expenditure, how to address issues that might affect interpretation of results, and recommendations for appropriate macronutrient distribution. Each intervention would be documented using the standardized terminology, including “Initiate enteral nutrition” or “Modify rate of feedings.”

**Conclusion**

Changes in health-care finance and regulation have resulted in the need to ensure that care is appropriate, timely, and evidence-based. The NCP provides the nutrition support RD with a framework for care and a terminology to describe nutrition problems that have been identified and interventions that are focused on the problems.

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**References**


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ERS were interested in hiring RDs who related to the model and that employ learning advanced-practice skills had those skills. A subsequent study revealed that RDs were interested in and Approach. A subsequent study revealed that RDs were interested in Attitude, Aptitude, Expertise, Context, Autonomy, as well as five subthemes: Using Initiative to Achieve successful, but there has been renewed interest in advanced-practice skills. A study of advanced-practice RDs with credentials in medical nutrition therapy have not been overtly nutrition support practice. An advanced-practice RD as “one who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context in which the RD practices” (2). ADA further states that “advanced-level practice is characterized by the integration of a broad range of unique theoretical, research-based, and practical knowledge that occurs as a part of training and experience beyond entry level” (2). Unfortunately, there is little agreement as to how the advanced-practice RD functions in the workplace, and there is no clear educational or experiential pathway to advanced practice. This article provides a perspective on and description of advanced practice and applies it to nutrition support, reviewing what is known from research, what is speculated by expert practitioners, and what might be needed to develop advanced-practice nutrition support dietetics further.