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<td>AACE/ACE</td>
<td>American Association of Clinical Endocrinologists/American College of Endocrinology</td>
</tr>
<tr>
<td>ABG</td>
<td>arterial blood gas</td>
</tr>
<tr>
<td>ABW</td>
<td>adjusted body weight</td>
</tr>
<tr>
<td>ACD</td>
<td>anemia of chronic disease</td>
</tr>
<tr>
<td>ACE</td>
<td>angiotensin-converting enzyme</td>
</tr>
<tr>
<td>ADA</td>
<td>American Diabetes Association</td>
</tr>
<tr>
<td>ADH</td>
<td>antidiuretic hormone</td>
</tr>
<tr>
<td>ADL</td>
<td>activities of daily living</td>
</tr>
<tr>
<td>AFA</td>
<td>arm fat area</td>
</tr>
<tr>
<td>AI</td>
<td>Adequate Intake</td>
</tr>
<tr>
<td>AHA</td>
<td>American Heart Association</td>
</tr>
<tr>
<td>ALP</td>
<td>alkaline phosphatase</td>
</tr>
<tr>
<td>ALT</td>
<td>alanine aminotransferase</td>
</tr>
<tr>
<td>AMA</td>
<td>arm muscle area</td>
</tr>
<tr>
<td>AMDR</td>
<td>Acceptable Macronutrient Distribution Range</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
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<td>------------------------------------------------</td>
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<tr>
<td>ASPEN</td>
<td>American Society for Parenteral and Enteral Nutrition</td>
</tr>
<tr>
<td>AST</td>
<td>aspartate aminotransferase</td>
</tr>
<tr>
<td>BIA</td>
<td>bioelectrical impedance analysis</td>
</tr>
<tr>
<td>BMI</td>
<td>body mass index</td>
</tr>
<tr>
<td>BMR</td>
<td>basal metabolic rate</td>
</tr>
<tr>
<td>BP</td>
<td>blood pressure</td>
</tr>
<tr>
<td>BUN</td>
<td>blood urea nitrogen</td>
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<tr>
<td>CAM</td>
<td>complementary and alternative medicine</td>
</tr>
<tr>
<td>CBC</td>
<td>complete blood count</td>
</tr>
<tr>
<td>CKD</td>
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<tr>
<td>CMS</td>
<td>Centers for Medicare &amp; Medicaid Services</td>
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<tr>
<td>COPD</td>
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<td>DBW</td>
<td>desired body weight</td>
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<td>DKA</td>
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<tr>
<td>DNS</td>
<td>Dietitians in Nutrition Support</td>
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<tr>
<td>DRI</td>
<td>Dietary Reference Intake</td>
</tr>
<tr>
<td>DXA</td>
<td>dual-energy x-ray absorptiometry</td>
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<tr>
<td>EAL</td>
<td>Evidence Analysis Library</td>
</tr>
<tr>
<td>EAR</td>
<td>Estimated Average Requirement</td>
</tr>
<tr>
<td>ECF</td>
<td>extracellular fluid</td>
</tr>
<tr>
<td>EER</td>
<td>estimated energy requirement</td>
</tr>
<tr>
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<td>essential fatty acid deficiency</td>
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<td>electronic health record</td>
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<tr>
<td>Abbreviation</td>
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</tr>
<tr>
<td>ESR</td>
<td>erythrocyte sedimentation rate</td>
</tr>
<tr>
<td>FFM</td>
<td>fat-free mass</td>
</tr>
<tr>
<td>FNRH</td>
<td>food- and nutrition-related history</td>
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<tr>
<td>FPG</td>
<td>fasting plasma glucose</td>
</tr>
<tr>
<td>GDH</td>
<td>glutamate dehydrogenase</td>
</tr>
<tr>
<td>GDM</td>
<td>gestational diabetes mellitus</td>
</tr>
<tr>
<td>GERD</td>
<td>gastroesophageal reflux disease</td>
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<tr>
<td>GGT</td>
<td>gamma-glutamyl transferase</td>
</tr>
<tr>
<td>GI</td>
<td>gastrointestinal</td>
</tr>
<tr>
<td>HbA1c</td>
<td>hemoglobin A1c</td>
</tr>
<tr>
<td>HBE</td>
<td>Harris-Benedict equation</td>
</tr>
<tr>
<td>HDL</td>
<td>high-density lipoprotein</td>
</tr>
<tr>
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<td>hemoglobin</td>
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<tr>
<td>HHS</td>
<td>hyperosmolar hyperglycemic state</td>
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<tr>
<td>HMG CoA</td>
<td>hydroxymethylglutaryl coenzyme A</td>
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<tr>
<td>HPN</td>
<td>home parenteral nutrition</td>
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<tr>
<td>HTN</td>
<td>hypertension</td>
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<tr>
<td>IBD</td>
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<tr>
<td>IBS</td>
<td>irritable bowel syndrome</td>
</tr>
<tr>
<td>IBW</td>
<td>ideal body weight</td>
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<tr>
<td>ICF</td>
<td>intracellular fluid</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
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<tr>
<td>IDA</td>
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<td>International Diabetes Foundation</td>
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<tr>
<td>IFG</td>
<td>impaired fasting glucose</td>
</tr>
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<td>impaired glucose tolerance</td>
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<tr>
<td>IJ</td>
<td>Ireton-Jones</td>
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<tr>
<td>INR</td>
<td>international normalized ratio</td>
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<tr>
<td>LOS</td>
<td>length of stay</td>
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<tr>
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<td>MAMC</td>
<td>midarm muscle circumference</td>
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<tr>
<td>MAOI</td>
<td>monoamine oxidase inhibitor</td>
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<tr>
<td>MCT</td>
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<td>MCV</td>
<td>mean corpuscular volume</td>
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<td>MDS</td>
<td>Minimum Data Set</td>
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<tr>
<td>NAFLD</td>
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<td>NCI</td>
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<tr>
<td>NCP</td>
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<td>NCPM</td>
<td>Nutrition Care Process and Model</td>
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NDTR  nutrition and dietetic technician, registered
NHANES National Health and Nutrition Examination Surveys
NHLBI National Heart, Lung, and Blood Institute
NPO nil per os (nothing by mouth)
NRS Nutrition Risk Score
NSAID nonsteroidal anti-inflammatory drug
OSA obstructive sleep apnea
OTC over the counter
PCOS polycystic ovary syndrome
PES problem, etiology, signs and symptoms
PG plasma glucose
PLP pyridoxal phosphate
PMH past medical history
PN parenteral nutrition
POA power of attorney
POC point of care
PSU Penn State University
PT prothrombin time
PTH parathyroid hormone
QOL quality of life
RBC red blood cells
RDA Recommended Dietary Allowance
RDN registered dietitian nutritionist
RDW red cell distribution width
REE resting energy expenditure
<table>
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<td>RLQ</td>
<td>right lower quadrant</td>
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<tr>
<td>RMR</td>
<td>resting metabolic rate</td>
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<td>RQ</td>
<td>respiratory quotient</td>
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<td>SEI</td>
<td>standard error for an individual</td>
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<tr>
<td>SGA</td>
<td>Subjective Global Assessment</td>
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<tr>
<td>SIADH</td>
<td>syndrome of inappropriate antidiuretic hormone</td>
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<tr>
<td>SNAQ</td>
<td>Short Nutrition Assessment Questionnaire</td>
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<td>sTfR</td>
<td>soluble transferrin receptor</td>
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<td>TfR</td>
<td>transferrin receptor</td>
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</tr>
<tr>
<td>$T_{\text{max}}$</td>
<td>maximum daily body temperature (degrees Celsius)</td>
</tr>
<tr>
<td>TSAT</td>
<td>transferrin saturation</td>
</tr>
<tr>
<td>TSF</td>
<td>triceps skinfold</td>
</tr>
<tr>
<td>UBW</td>
<td>usual body weight</td>
</tr>
<tr>
<td>UL</td>
<td>Tolerable Upper Intake Level</td>
</tr>
<tr>
<td>US</td>
<td>ultrasound</td>
</tr>
<tr>
<td>$V_E$</td>
<td>minute ventilation</td>
</tr>
<tr>
<td>WC</td>
<td>waist circumference</td>
</tr>
<tr>
<td>WIC</td>
<td>Special Supplemental Nutrition Program for Women, Infants, and Children</td>
</tr>
</tbody>
</table>
About the Authors

Pamela Charney, PhD, MS, RDN, LDN, FAND, has years of experience in nutrition support in both adult and pediatric care and in a variety of settings ranging from small community hospitals to large, tertiary, teaching medical centers. She has also managed clinical nutrition departments, nutrition support teams, and multidisciplinary clinics for children with special health care needs. She has led groups forming teams or looking to improve team effectiveness. Dr Charney completed her PhD at Rutgers University and has worked as a consultant in the areas of nutrition informatics, evaluation of health care quality, and evaluation of clinical information systems. She has extensive volunteer service to both the Academy of Nutrition and Dietetics and the American Society for Parenteral and Enteral Nutrition, including service on the boards of directors for both organizations. As a charter member of the Standardized Language Committee for the Academy of Nutrition and Dietetics, Dr Charney is considered an expert in nutrition and clinical informatics, nutrition diagnosis, and the use of standardized terminology in clinical care.

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activities, Ms Malone has authored multiple peer-reviewed articles and book chapters on nutrition support. Over her career, she has served in many nutrition leadership capacities, including president of ASPEN, and on the Academy of Nutrition and Dietetics Board of Directors.
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Preface

It has been a professional honor to be involved in the *Academy of Nutrition and Dietetics Pocket Guide to Nutrition Assessment*, beginning with publication of the first edition in 2004, now in its fourth edition. Development of the first edition began as a project for the Dietitians in Nutrition Support dietetic practice group. We quickly realized that there was a need for a resource that crossed all areas of clinical dietetics practice and was not limited to nutrition support. Because the first edition of the *Pocket Guide to Nutrition Assessment* was released before the advent of smartphones, tablets, and easy access to online information, we wanted the pocket guide to be a resource that clinicians would have at their fingertips. As the title indicated, the size of the book would literally fit into a lab-coat pocket. Today, clinicians have the option to purchase a slightly larger print copy or an electronic version, making the fourth edition of the *Pocket Guide to Nutrition Assessment* truly flexible, made to meet the needs of busy dietetics professionals.

Before each revision of the *Pocket Guide to Nutrition Assessment*, we reviewed the landscape of dietetics practice. When the Nutrition Care Process (NCP) and standardized dietetics terminology were released, we added a chapter designed to illustrate how nutrition assessment was the critical first step in the NCP. With subsequent updates to the NCP, the outline of the book was revised to ensure that we included the appropriate nutrition assessment domains. We are proud to include in this latest edition a section on malnutrition. While dietitians have always been responsible for diagnosing and treating patients who are malnourished, it is only recently that our standardized terminology provided a way to consistently define the characteristics associated with malnutrition in all patient types in all care settings. Additional updates have been made with each edition to reflect new evidence and address user feedback.
The *Academy of Nutrition and Dietetics Pocket Guide to Nutrition Assessment* has proven to be an invaluable resource for clinicians at all levels of practice. It is especially gratifying to know that it is used in many education programs as an authoritative teaching tool for students and interns. We remain inspired by the ongoing use of this pocket guide and look forward to its continued evolution.

Pamela Charney, PhD, MS, RDN, LDN, FAND
Ainsley Malone, MS, RDN, LD, CNSC, FAND, FASPEN
Acknowledgments

We wish to thank the reviewers of this fourth edition for providing insightful feedback and the students, interns, clinicians, and educators who have shared their appreciation and suggestions over the years, which helps motivate us in creating each new edition.

We gratefully acknowledge all of the past contributors to this pocket guide, including Gail Cresci, PhD, RD; Marion F. Winkler, PhD, RD, CNSD; Trisha Fuhrman, MS, RDN, LD, FAND; Jennifer C. Lefton, MS, RD, LD, CNSC, FAND; Mary J. Marian, DCN, RDN, CSO, FAND; Susan R. Roberts, MS, RDN, LD, CNSC; Mary Russell, MS, RDN, LDN, FAND, FASPEN; Annalynn Skipper, PhD, RD, CNSC, FADA; and Cheryl W. Thompson, PhD, RD, CNSC.
Publisher’s Note on Gender-Inclusive Language

The Academy of Nutrition and Dietetics encourages diversity and inclusion by striving to recognize, respect, and include differences in ability, age, creed, culture, ethnicity, gender, gender identity, political affiliation, race, religion, sexual orientation, size, and socio-economic characteristics in the nutrition and dietetics profession.¹

As part of our commitment to diversity and inclusion, all new and updated editions of professional books and practitioner resources published by the Academy of Nutrition and Dietetics will transition to the use of inclusive language. As appropriate, inclusive language, including person/persons, individual/individuals, or patient/patients, is used to respect and recognize transgender and nonbinary people. Where gender or sex is referred to in this book, it is important to note that gender was not further specified for study participants and specific recommendations for transgender people were not provided.

Existing guidelines for nutrition assessment and interventions rely primarily on gender-specific values and recommendations. As research continues to explore the unique health and nutrition needs of transgender people, nutrition and health practitioners can expand their knowledge and understanding by reviewing available resources that provide guidance for person-centered nutrition care of gender-diverse individuals.²-⁴ The use of inclusive language is consistent with the American Medical Association’s AMA Manual of Style⁵ as well as other health
professional groups and government organizations. The Academy of Nutrition and Dietetics will continue to evolve to adopt consensus best practices related to nutrition care of gender-diverse individuals that maximize inclusivity and improve equitable and evidence-based care.


CHAPTER 1

The Nutrition Care Process

With the introduction of the Nutrition Care Process and Model (NCPM) in 2003, the dietetics profession established a framework for communicating specific interventions unique to dietetics practice. This framework consistently describes the process that registered dietitian nutritionists (RDNs) use to think critically and to make decisions in all care settings.¹⁻⁴ Recent updates allow the NCPM to guide dietetics practice in all care settings.¹⁻² As such, the NCPM helps RDNs clearly and systematically articulate the vital services they provide and demonstrate that they are integral members of the health care team.

Both patients/clients and other health care providers generally recognize that the RDN provides a unique and highly valued service. However, regulatory agencies and third-party payers are focused on outcomes. When evaluating nutrition care, these agencies ask, “Do RDN services positively impact health outcomes or quality of care in ways that can be documented and measured?”⁵ Use of the NCPM helps answer this question by collecting and analyzing data regarding outcomes of nutrition care.
Health Care Processes and Quality of Care

Avedis Donabedian, MD, the “father of health care quality,” noted that health outcomes are a key component of any assessment of care quality. Donabedian also recognized that evaluation of health care quality can be complicated because many outside factors may influence health outcomes. There may be, for example, a lengthy time lag between the time of the intervention and significant improvement in the health outcome of interest. When health outcomes are not as expected or desired, health care administrators are tasked with determining why outcome goals were not achieved. Outcomes can be affected by a particular health care provider’s actions or by how care is provided (ie, the care process). A physician may decide, for example, that a patient with a wound infection needs to receive a specific antibiotic. The infection might fail to improve because the provider ordered the wrong antibiotic (an issue specific to the provider) or because too much time elapsed between entry of the order and the antibiotic being administered (an issue related to the process of care). Having a standardized care process for a profession, such as the NCPM, helps differentiate between provider-specific causes and process-related issues when evaluating health outcomes.

RDNs are not the only health care providers who utilize a care process to guide critical thinking and decision-making in practice. Each health care profession has a care process that allows members to delineate the aspects of care that are unique to their profession.

The Nutrition Care Process and Model Explained

In the original (2008) visual representation of the NCPM, the relationship between the RDN and the patient/client or group is positioned in a circle at the center of the graphic and surrounded by three rings. More recent updates included minor changes to the model. The interior ring depicts the four steps of the Nutrition Care Process (NCP):
• nutrition assessment and reassessment
• nutrition diagnosis
• nutrition intervention
• nutrition monitoring and evaluation

The next ring lists factors intrinsic to the practice of dietetics that affect nutrition care, and the outer ring identifies concepts that define the environment in which nutrition care is provided. Finally, the graphic shows the screening and referral system and the outcomes management system as supporting systems of the NCP (see Figure 1.1). Although not integral parts of the NCP, the screening and referral system and the outcomes management system are closely related and are important to the overall process.

Documenting Care Using the Nutrition Care Process Terminology

Successful implementation of the NCP in clinical practice is supported by the use of standardized dietetics terminology, known as the Nutrition Care Process Terminology (NCPT). Note that the website platform that hosts the list of terms is referred to as eNCPT. Before the development of the NCPT, RDNs would use a variety of words and phrases to describe nutrition problems. In most cases, the words and phrases used were accepted and understood by other RDNs and members of the particular health care team; this is known as local terminology. However, providers in other settings may use different terms with different definitions when describing the same concept. RDNs in one location might use the term “malnutrition,” whereas RDNs in another setting might use the term “undernutrition” when describing a situation in which nutrient intake is less than the requirements for a given length of time. This use of locally developed terminologies may be convenient at the local level but makes it difficult to correctly aggregate and analyze data from multiple care settings over a wider geographical area.

Use of the standardized NCPT ensures consistent use of words and phrases that have the same meaning, regardless of practice setting and
FIGURE 1.1 Nutrition Care Process Model

geographic location. Data from the nutrition assessment may indicate, for example, that intake of food and beverages is not sufficient to meet estimated nutrient requirements. When the RDN uses the NCPT term “inadequate oral intake” to label the problem, the meaning is understood as “oral food/beverage intake is less than established reference standards or recommendations based on physiological needs.”

Nutrition Assessment and the Nutrition Care Process

As noted, nutrition assessment is the first step of the NCP. Nutrition screening is used to identify patients/clients who may have a nutrition diagnosis even though they do not have overt signs or symptoms of a nutrition problem. If the nutrition screen indicates risk for a nutrition problem, the RDN completes a nutrition assessment to correctly diagnose existing nutrition problems (see Chapter 2 for more information on nutritional risk screening).

Nutrition Assessment Components

Nutrition assessment terms are organized into domains (sometimes called categories). Assessment techniques for the domains listed below are discussed in detail in Chapters 3 through 7:

- food/nutrition-related history
- anthropometric measurements
- biochemical data, medical tests, and procedures
- nutrition focused physical findings
- client history

Other assessment domains include:

- Assessment, monitoring, and evaluation tools: This domain addresses the tools used for health or disease status or risk assessment, reassessment, and monitoring and evaluation.
• Etiology: This domain helps communicate the cause or contributing factor of a nutrition diagnosis (problem) identified with evidence gathered in the nutrition assessment.

• Progress evaluation: This domain is used in nutrition reassessment to evaluate progress toward nutrition-related goals and resolution of a nutrition diagnosis.

Collecting and Evaluating Data

A great deal of research in medicine and nursing practice demonstrates that novice, proficient, and expert clinicians differ in the types and amounts of data needed to accurately diagnose health conditions. At this time, there is no reason to think that dietetics practice would differ. RDNs at different levels of practice may gather different amounts or types of data, but the correct diagnosis of the patient’s/client’s nutrition problem remains the goal.

Expert RDNs quickly determine the types and amounts of information needed, efficiently gather and evaluate the information, create a “nutrition differential” (list of potential diagnoses), rule out incorrect diagnoses, and correctly diagnose existing nutrition problems through an iterative process of gathering and evaluating new information as needed. Novice and proficient RDNs are also expected to diagnose nutrition problems correctly but may need additional time and resources. Regardless of the level of practice, RDNs are obligated to refer patients/clients to more experienced practitioners if the situation is outside their area of practice or experience.

What and How Much Data to Collect

Accurate and efficient diagnosis of nutrition problems requires that RDNs determine the types and amounts of nutrition assessment data that should be collected. Although novice and proficient RDNs may need to collect more data than expert RDNs, practitioners at all levels of experience must have an organized approach to data collection.
Nutrition assessment begins with the reason for referral to the RDN and information from the patient history. This information guides selection of the types and amounts of data collected. If the patient is not taking any medications, there would be little reason to conduct a detailed assessment of the diet for possible interactions of food and medication. In contrast, if the patient has a recent history of gastrointestinal (GI) surgery, weight loss, and chemotherapy for colorectal cancer, the RDN will focus on data that will help determine the extent and severity of weight loss and the impact of surgery and chemotherapy on nutrient needs, intake, and metabolism.

After collecting data, the RDN determines whether data fall within established normal limits. If the RDN determines that data are not normal, the clinical importance of the abnormality must be evaluated. The last step before diagnosing nutrition problems is to categorize data. In most cases, an expert RDN completes these final steps quickly. Experience has taught experts how to evaluate nutrition assessment data quickly. Proficient RDNs may complete part of this step efficiently, whereas other parts may require more thought and evaluation. Novice RDNs typically need more time to think and consider each alternative in evaluating assessment data.

Regardless of level of practice, the RDN is responsible for determining whether enough data have been collected to diagnose existing nutrition problems correctly. The collection of insufficient data may lead to an incorrect diagnosis. The collection of extraneous or unnecessary data may also lead to an incorrect diagnosis in addition to increased costs associated with nutrition care.

**Nutrition Diagnosis**

Nutrition diagnosis is the second step of the NCP. RDNs are responsible for correctly diagnosing nutrition problems. Research in medical and nursing education describes several patterns of thinking used to make decisions in patient care, shown in Box 1.1.8-11 It may be assumed that RDNs would also utilize these patterns to make decisions in patient care.
BOX 1.1 Examples of Diagnostic Thought Processes

**Pattern recognition**
Decision-making is based on past experience with similar cases
Most successfully used by clinicians with experience

**Exhaustive thinking**
As much data as possible are gathered and searched for all possible diagnoses
Typically used by novice clinicians

**Algorithms**
Answers to a series of yes/no questions lead to diagnosis
Most often used by novice and proficient clinicians

**Hypothetico-deductive reasoning (Scientific Method)**
A list of possible diagnoses is developed and revised as information gathering progresses
Most appropriately used by experienced clinicians

Documenting the Diagnosis

Recommendations for documenting and communicating nutrition diagnoses are often the least understood part of the NCP. The Academy of Nutrition and Dietetics recommends use of PES (problem, etiology, and signs and symptoms) statements when documenting nutrition diagnoses. This recommendation is based on nursing research that led to the creation of the North American Nursing Diagnosis Association (NANDA) nursing terminology.¹²⁻¹⁴

When written correctly, the PES statement can clearly and concisely describe what the RDN diagnosed, why the diagnosis was made, and the key finding that triggered the diagnosis. The statement reads like this:

*Problem (the nutrition diagnosis) related to Etiology (the major factor[s] contributing to the nutrition diagnosis) as evidenced by Signs and Symptoms (the key abnormal finding[s] that determined the nutrition diagnosis).*
The following example shows a nutrition diagnosis written as a PES statement:

*Inadequate oral intake related to chemotherapy-related nausea as evidenced by documented intake that is 25% of estimated requirements.*

See Box 1.2 for tips to create clear and concise PES statements that communicate the value of nutrition care to all stakeholders.

Before documenting a nutrition diagnosis, the RDN must be sure that the diagnosis is correct and contextually appropriate. In many cases, more than one diagnosis could be made. It is not unusual, for example, for a patient who has the nutrition diagnosis “overweight/obesity” to also have “excessive oral intake,” “physical inactivity,” “food/nutrition-related knowledge deficit,” or some combination of these diagnosis. RDNs (or their employers) will need to determine if a PES statement must be written for each diagnosis or if the RDN is able to prioritize and document based on the situation. Nevertheless, all nutrition diagnoses must be documented. Lack of documentation implies that the RDN did not correctly diagnose all nutrition problems. In addition,

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**BOX 1.2  Tips for Documenting Nutrition Diagnoses**

The PES (problem, etiology, signs and symptoms) statement must be clear and concise—it must be easily understood by other members of the health care team.

Each PES statement must consist of one nutrition diagnosis, one etiology, and one set of signs and symptoms.

If the patient has more than one nutrition diagnosis, facilities can determine if each diagnosis should have an associated PES statement or if only the primary diagnosis requires documentation using a PES statement. However, each diagnosis should be documented (with or without a PES statement).

Unless local synonyms have been developed and mapped to the Nutrition Care Process Terminology (NCPT), terms used should be from the standardized NCPT.
when nutrition diagnoses are not documented, the implication is that another health care professional would be responsible.

**Note:** Use of PES statements to document nutrition diagnoses is not required by any regulatory agency. PES statements are one of a number of ways to communicate and document nutrition diagnoses. Each facility should determine how documentation should be accomplished.

### Improving PES Statements

Box 1.3 shows examples of PES statements that are rewritten to improve clarity. A brief explanation is also included.

#### BOX 1.3  Examples of Improved PES Statements

**Example 1**

**Original:** Inconsistent carbohydrate intake related to poor diet choices as evidenced by hemoglobin A1c (HbA1c).

**Improved:** Inconsistent carbohydrate intake related to poor diet choices as evidenced by significant differences in total carbohydrate consumed over 4 days.

**Explanation:** The original nutrition diagnosis is not supported by the sign or symptom. HbA1c is a laboratory test used to estimate long-term blood glucose control. HbA1c does not measure consistencies in carbohydrate intake. Because the diagnosis is focused on inconsistent carbohydrate intake, the sign or symptom must describe some aspects of carbohydrate intake consistency that can be measured to determine whether the nutrition intervention was effective.

*Continued on next page*
Nutrition Intervention

Nutrition intervention is the third step in the NCP and involves purposefully planned actions to change a nutrition-related behavior, a risk factor, an environmental condition, or an aspect of a patient’s health status. After correctly diagnosing nutrition problems, the RDN is responsible for planning and ensuring that the appropriate intervention is implemented.

Ideally the intervention is directly related to resolving either the nutrition diagnosis or its etiology. Box 1.4 illustrates this point. Less often, it is directed at relieving the signs and symptoms of the nutrition problem. The interventions may be actions performed by the RDN, recommended to the physician or other health care professionals, or coordinated or delegated to other practitioners.

BOX 1.3  Examples of Improved PES Statements (cont.)

Example 2

Original: Altered gastrointestinal (GI) function related to short bowel syndrome as evidenced by hypoalbuminemia and need for parenteral nutrition.

Improved: Altered GI function related to short bowel syndrome as evidenced by seven watery stools per day for previous 5 days.

Explanation: There is some thought that the etiology of a nutrition diagnosis should never include a medical diagnosis, but in some cases, nutrition diagnoses are directly caused by a medical problem. In this example, altered GI function is a logical consequence of short bowel syndrome. Hypoalbuminemia is not a finding that can be directly related to altered GI function, nor will improvement in albumin levels indicate improvement in GI function. Parenteral nutrition is an intervention, not a sign/symptom of a nutrition diagnosis. Changes in stool output can be considered an indicator of bowel function in patients who have short bowel syndrome. Improvement in stool output following intervention would be seen as a sign that the correct nutrition intervention was implemented.
Nutrition Monitoring and Evaluation

Nutrition monitoring and evaluation is the fourth step of the NCP. In this step, the RDN assesses the patient/client to determine and document whether the intervention had the desired impact on the diagnosis. Because monitoring and evaluation involves reassessment, the standardized terminology for this step is mostly the same as the NCPT for nutrition assessment. The exception is the client history domain, which applies only to assessment (because an intervention could not change history).

During reassessment, the RDN evaluates and communicates whether the nutrition-related problem still exists and the progress made toward resolving the problem. This process involves identifying, in advance, the appropriate reassessment data or nutrition care indicators that will be reviewed and compared with recognized, science-based reference standards, recommendations, client goals, or baseline data.

### BOX 1.4 Examples of Correct Nutrition Interventions

<table>
<thead>
<tr>
<th>Nutrition diagnosis (etiology)</th>
<th>Intervention strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity (related to overeating)</td>
<td>Correct: Energy-modified diet: decreased energy diet</td>
</tr>
<tr>
<td></td>
<td>Incorrect: Nutrition education—content: education on low-calorie diet</td>
</tr>
<tr>
<td></td>
<td>Rationale: The correct intervention is related to the cause of the problem, overeating. Education would treat a knowledge deficit.</td>
</tr>
<tr>
<td>Food/nutrition-related knowledge deficit (related to inability to identify lower calorie foods)</td>
<td>Correct: Nutrition education—application: label-reading skills</td>
</tr>
<tr>
<td></td>
<td>Incorrect: Energy-modified diet: decreased energy diet</td>
</tr>
<tr>
<td></td>
<td>Rationale: A knowledge deficit is treated by increasing knowledge.</td>
</tr>
</tbody>
</table>
Malnutrition Diagnosis and Treatment

The adoption of the NCP and standardized terminology aims to improve nutrition care in all areas of dietetics practice, including the care of patients who are malnourished or at risk of malnutrition. It is generally accepted that malnutrition is associated with increased risk for iatrogenic complications, increased length of hospital stay, and increased health care costs. Despite these known negative associations with malnutrition, reimbursement for nutrition intervention has been inconsistent. Third-party payers have only recently acknowledged the link between nutrition interventions and outcomes, supporting the idea that correct diagnosis of malnutrition can improve reimbursement strategies.

Malnutrition is diagnosed using findings from the patient history and physical examination combined with the RDN’s clinical judgment. Consensus statements recommend utilization of certain clinical characteristics for accurate diagnosis of malnutrition. A minimum of two of the following six characteristics is recommended for diagnosis of either severe or nonsevere malnutrition:

- Energy intake: compare recent intake with estimated requirements; report inadequate intake as a percentage of estimated energy requirements over time.
- Interpretation of weight loss: evaluate weight with other clinical findings; assess weight change over time, reported as a percentage of weight lost from baseline.
- Body fat: perform physical assessment to identify loss of subcutaneous fat (eg, orbital, triceps, fat overlying the ribs).
- Muscle mass: perform physical assessment to assess muscle loss (eg, wasting of the temples, clavicles, shoulders, interosseous muscles, scapula, thigh, and calf).
- Fluid accumulation: evaluate generalized or localized fluid accumulation evident on examination (eg, extremities, vulvar/scrotal edema, ascites); determine whether weight loss is masked by edema.
• Reduced grip strength: consult normative standards supplied by the manufacturer of the measurement device.

See Tables 1.1 to 1.3 for clinical characteristics of malnutrition in the contexts of acute illness or injury, chronic illness, and social or environmental circumstances.

Practitioners should be aware that the consensus statements have not been validated and should be considered expert opinion. Use of hand-grip dynamometry is not evidence based and cannot be recommended at this time. NCPT incorporates similar characteristics and can be utilized to document the nutrition diagnosis of malnutrition (undernutrition) and to ensure that the role of the RDN in diagnosis and treatment of malnutrition is described clearly. Box 1.5 compares assessment and documentation of malnutrition characteristics with the associated NCPT domains.2,16

The Subjective Global Assessment (SGA), developed in 1982, uses information gathered from the physician’s history and physical

### TABLE 1.1 Clinical Characteristics of Malnutrition in Acute Illness or Injury16

<table>
<thead>
<tr>
<th></th>
<th>Nonsevere (moderate) malnutrition</th>
<th>Severe malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy intake</td>
<td>&lt;75% of EER for &gt; 7 d</td>
<td>≤50% of EER for ≥ 5 d</td>
</tr>
<tr>
<td>Weight loss</td>
<td>1%–2%</td>
<td>&gt;2%</td>
</tr>
<tr>
<td></td>
<td>5%</td>
<td>&gt;5%</td>
</tr>
<tr>
<td></td>
<td>7.5%</td>
<td>&gt;7.5%</td>
</tr>
<tr>
<td></td>
<td>1 wk</td>
<td>1 wk</td>
</tr>
<tr>
<td></td>
<td>1 mo</td>
<td>1 mo</td>
</tr>
<tr>
<td></td>
<td>3 mo</td>
<td>3 mo</td>
</tr>
<tr>
<td>Loss of body fat</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>Loss of muscle mass</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>Fluid accumulation</td>
<td>Mild</td>
<td>Moderate-severe</td>
</tr>
<tr>
<td>Reduced grip strength</td>
<td>NA</td>
<td>Measurably reduced</td>
</tr>
</tbody>
</table>

Abbreviations: EER, estimated energy requirement; NA, not applicable
### TABLE 1.2 Clinical Characteristics of Malnutrition in Chronic Illness

<table>
<thead>
<tr>
<th></th>
<th>Nonsevere (moderate) malnutrition</th>
<th>Severe malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy intake</strong></td>
<td>&lt;75% of EER for ≥1 mo</td>
<td>≤75% of EER for ≥1 mo</td>
</tr>
<tr>
<td><strong>Weight loss</strong></td>
<td>5% 1 mo</td>
<td>&gt;5% 1 mo</td>
</tr>
<tr>
<td></td>
<td>7.5% 3 mo</td>
<td>&gt;7.5% 3 mo</td>
</tr>
<tr>
<td></td>
<td>10% 6 mo</td>
<td>&gt;10% 6 mo</td>
</tr>
<tr>
<td></td>
<td>20% 1 y</td>
<td>&gt;20% 1 y</td>
</tr>
<tr>
<td><strong>Loss of body fat</strong></td>
<td>Mild</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>Loss of muscle mass</strong></td>
<td>Mild</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>Fluid accumulation</strong></td>
<td>Mild</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>Reduced grip strength</strong></td>
<td>NA</td>
<td>Measurably reduced</td>
</tr>
</tbody>
</table>

Abbreviations: EER, estimated energy requirement; NA, not applicable

### TABLE 1.3 Clinical Characteristics of Malnutrition in Social or Environmental Circumstances

<table>
<thead>
<tr>
<th></th>
<th>Nonsevere (moderate) malnutrition</th>
<th>Severe malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy intake</strong></td>
<td>&lt;75% of EER for ≥3 mo</td>
<td>≤50% of EER for ≥1 mo</td>
</tr>
<tr>
<td><strong>Weight loss</strong></td>
<td>5% 1 mo</td>
<td>&gt;5% 1 mo</td>
</tr>
<tr>
<td></td>
<td>7.5% 3 mo</td>
<td>&gt;7.5% 3 mo</td>
</tr>
<tr>
<td></td>
<td>10% 6 mo</td>
<td>&gt;10% 6 mo</td>
</tr>
<tr>
<td></td>
<td>20% 1 y</td>
<td>&gt;20% 1 y</td>
</tr>
<tr>
<td><strong>Loss of body fat</strong></td>
<td>Mild</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>Loss of muscle mass</strong></td>
<td>Mild</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>Fluid accumulation</strong></td>
<td>Mild</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>Reduced grip strength</strong></td>
<td>NA</td>
<td>Measurably reduced</td>
</tr>
</tbody>
</table>

Abbreviations: EER, estimated energy requirement; NA, not applicable
The Nutrition Care Process

examination to diagnose malnutrition. The following components are included in the SGA:

- weight and weight changes
- appetite and intake
- GI symptoms
- functional status
- physical exam for fat and muscle wasting

The SGA has been validated and, as such, is the gold standard with which the consensus statement assessment tool would be compared. The important role of the RDN in correctly diagnosing malnutrition cannot be overstated. See Box 1.6 for a case study.

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**BOX 1.5 Malnutrition Assessment Characteristics Compared With Nutrition Care Process Terminology Nutrition Assessment Domains**

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BOX 1.6  Case Study Utilizing the Nutrition Care Process

A 26-year-old woman was referred by her primary care provider to the outpatient registered dietitian nutritionist (RDN) for “treatment of malnutrition.” On arrival at clinic, the patient was weighed and measured. She weighed 105 lb (47.7 kg) and was 66 in tall (167.6 cm). Her body mass index was 16.9. A review of the patient’s medical record revealed that she weighed between 104 lb and 108 lb over the past 4 years. The medical and surgical history was unremarkable. The nutrition focused physical examination revealed only that the patient appeared to be very thin and had some mild temporal fat loss. The patient worked full time as an administrative assistant and had a part-time job (two to three evenings per week) as a musician. On nights that she worked, she would skip dinner and eat packaged cheese and crackers in the car and typically did not get home until after midnight. She stated that she “caught up on her sleep” by sleeping in until 1 PM or 2 PM on weekends. Otherwise her food and nutrition history revealed that her intake was adequate for weight maintenance 4 d/wk with possible sub-optimal intake only on days that she worked in the evenings and on weekends. The patient stated that she would like to gain 4 to 5 lb but was not sure how to do that. This meeting was her first with an RDN.

Based on the information gathered during the nutrition assessment, the RDN made the following diagnoses:

- Underweight related to diet and lifestyle, as evidenced by documented weight history and patient desire to gain weight
- Inadequate oral intake related to lack of time for several meals per week, as evidenced by diet recall
- Food- and nutrition-related knowledge deficit related to diet for weight gain, as evidenced by patient report of no prior nutrition education

The RDN did not diagnose malnutrition in this patient. The patient’s weight had been stable for the past several years. There was also no indication that the patient would not be able to maintain or gain weight given implementation of the appropriate nutrition intervention.

Continued on next page
The RDN provided nutrition education about methods to increase the energy content of meals and snacks. The patient also agreed to attempt to pack a high-energy snack to eat in the car on the way to her second job and to leave a snack at her bedside on weekends. She would also set an alarm for midmorning on weekends so she could consume the snack and go back to sleep. The patient returned for follow-up 3 months later and had gained 2 lb. She stopped eating the morning snack on weekends but added a midafternoon snack at work and continued to bring a high-energy snack to eat in the car. She was pleased with her progress and agreed to return in 3 months for a weight check. The RDN monitored the patient’s weight and food intake to adjust future nutrition education plans.

At this point, if the patient had not gained weight, the RDN would reassess the patient and possibly diagnose malnutrition based on additional information gathered.

This case highlights the role of the RDN in ensuring that malnutrition is correctly diagnosed. Whereas other members of the health care team looked only at a snapshot of the patient’s weight before diagnosing incorrectly, the RDN carefully evaluated all five components of the nutrition assessment. The RDN also kept the patient at the center of the care process by incorporating the patient’s experiences and plans when deciding on an appropriate nutrition intervention.

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