Nutrition Care Process (NCP) Update Part 2: Developing and Using the NCP Terminology to Demonstrate Efficacy of Nutrition Care and Related Outcomes

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From the Academy

NUTRITION AND DIETETICS practitioners around the world use the Nutrition Care Process Terminology (NCPT) to communicate the Nutrition Care Process (NCP). In this article, nutrition and dietetics practitioners or professionals; dietitians; dietitian-nutritionists; and dietetic technicians, registered, are collectively referred to as professionals. The NCPT is a standardized terminology or controlled vocabulary that complements the NCP, a systematic problem-solving roadmap for planning and providing nutrition and dietetic care to individuals and populations, and researching related outcomes. Recently, a scheduled update of the NCP and Model (NCPM) was published. The NCPT is the graphic representation of the NCP. The NCP includes four steps that collectively describe the unique contributions of nutrition and dietetics practitioners. These steps are Nutrition Assessment and Reassessment, Nutrition Diagnosis, Nutrition Intervention, and Nutrition Monitoring and Evaluation. A companion to the model update publication, this article reviews the background of the NCP and describes the current state and ongoing enhancements of the NCPT. A further aim is to illustrate how the NCPT communicates the unique functions of nutrition and dietetics practitioners and supports the research on nutrition and dietetics care. This article replaces previous information on the use of the NCPT.

A DECADE OF USE AND DEVELOPMENT

The NCPT, formerly known as the International Dietetics and Nutrition Terminology (IDNT), was designed to meet the definition of a controlled vocabulary as determined by the National Library of Medicine. This means that the NCPT is a system of terms organized in a hierarchical structure, with definitions and cross-references used to index and retrieve a body of literature in a bibliographic, factual, or other database. The NCPT was initially presented as a documentation tool for electronic health records (EHRs). Of note, the IDNT became the NCPT in 2014 to emphasize its linkage to the NCP. Today, the NCPT is a tool that standardizes nutrition and dietetics-related communication beyond the health care setting and is capable of demonstrating quality of care and related outcomes.

In 2003, the Academy of Nutrition and Dietetics (Academy), formerly the American Dietetic Association, completed a review of defined health care vocabularies to evaluate whether these existing vocabularies adequately communicated the scope of nutrition care. Although several of the defined terms at the time included nutrition-focused terms, they did not describe the complete range or the specific activities performed by nutrition and dietetics practitioners.

To address this gap in nutrition and dietetics terminology, the Standardized Language Task Force, composed of 12 Academy member volunteers supported by terminology consultants and Academy staff, undertook development of terminology for the NCP step Nutrition Diagnosis. Sixty-two Nutrition Diagnosis terms were published in 2006. Subsequently, the Task Force developed terms for the Nutrition Assessment, Nutrition Intervention, and Nutrition Monitoring and Evaluation NCP steps. As a result, an official terminology that supported all four steps of the NCP was published in 2008. Currently, the NCPT Owners Research Committee (NCPTROC) of the Academy oversees the development and maintenance of the NCPT with support from its workgroups (ie, International, Advisory, and Classification) and in collaboration with the Council on Research, Informatics, and Interoperability and Standards Committees. The complete NCPT (electronic NCPT [eNCPT]) is released once a year and is available through a web-based platform. A book, the Abridged Nutrition Care Process Terminology (NCPT) Reference Manual: Standardized Terminology for the Nutrition Care Process provides a select subset of NCPT terms in print form.

The NCPT has developed in several aspects since its original launch. Several international nutrition and dietetics organizations work collaboratively with the Academy to support, adopt, and translate the NCPT into different languages (Figure 1). Also, the application and related experiences with NCPT have been reported in various practice and education settings. To better communicate nutrition care in practice and research, processes for...
modifying the NCPT have been implemented by the NCPROC that ensure a responsive environment for NCPT enhancement. As a result, the number of NCPT terms has expanded to support the range of skills and roles of nutrition and dietetics practitioners. Synonyms have been added that embrace practice and cultural sensitivities. Because the NCPT is among many health care terminologies, its terms are submitted to larger interdisciplinary international clinical terminology standards such as Systematized Nomenclature of Medicine-Clinical Terms (SNOMED-CT) and Logical Observation Identifiers Names and Codes (LOINC) on an ongoing basis.20,21 In recent years, the NCPT has been used in practice-focused nutrition research showing the efficacy and degree of application of the NCP, as well as adherence to evidence-based nutrition practice guidelines.18,22-24

**NCPT: THE STANDARDIZED TERMINOLOGY OF NUTRITION AND DIETETICS**

The NCPT is organized by NCP steps and within each step it is organized by domains, classes, and subclasses (Figure 2). An extensive number of NCP terms have reference sheets that serve as a descriptive profile for the term. NCP terms on the reference sheets are defined in the case that they do not exist in the international clinical terminology standards described elsewhere in this article.

The purpose of the NCPT is to provide an accurate and specific description of the services that nutrition and dietetics practitioners deliver, and the investigation of resulting outcomes. This achieves a common understanding not only among nutrition and dietetics practitioners, but also outside the profession, including clients (individuals or populations) and other disciplines. Another substantial purpose of the NCPT is that it provides a means to show the influence of nutrition care on outcomes and quality of care to health professionals and the public. Regardless of chosen note format (eg, the traditional Subjective, Objective, Assessment, Plan system or the Assessment, Diagnosis, Intervention, Monitoring, Evaluation system) or other means of documentation/reporting based on policy or personal preference, nutrition and dietetics practitioners use NCPT to communicate care with precision.23,25 Examples of the application of NCP using NCPT in a variety of practice settings are illustrated in Figure 3.

In a dynamically evolving health care environment, the vision for the NCP and NCPT is to facilitate communication within and among health care systems for outcomes research and quality improvement. Thus, the NCPT is an important tool to advance the field of nutrition and dietetics, related education, research, and policy as the updated logic model guiding terminology development demonstrates (Figure 4).

**Acceptance and Adoption**

The NCPT supports application of the NCP in numerous countries. The European Federation of the Associations of Dietitians Report on Knowledge and Use of a Nutrition Care Process and Standardized Language by Dietitians in Europe11 reported that there were positive attitudes for the use of a standardized terminology that describes the NCP. At the time of this survey, seven European countries

**International Translations Timeline**

Figure 1. International translations timeline. Countries that translated during the same year are listed in alphabetical order. *Country that has conducted regular updates of the Nutrition Care Process Terminology. ND=nutrition diagnosis. NI=nutrition intervention.
**Figure 2.** Nutrition Care Process (NCP) Terminology hierarchy.
### Case Situation: Women of reproductive age found with low Hgb and iron-deficient diet

**Public Health**

Foodservice Situation: In a natural disaster, it is estimated that 5 d are needed to repair and restore potable water supply.

**Long-Term Care**

Situation: Daughter of personal care home resident concerned with mother's food intake. Resident has swallowing difficulties.

**Acute Care**


**Nonacute Care**

Situation: Female teacher with complaint of undesired weight gain referred by hospital RDN (Same person as in Acute Care).

### Assessment

| Assessment | Food Intake: infrequent consumption of iron-rich foods, Mineral element intake: <67% EAR for iron for gender and age, Nutritional anemia profile: Hgb: high incidence of values below the population reference standard (40% of women of reproductive age) Comparative standards: Estimated mineral needs: EAR for iron for women aged 19-50 y=8.1 mg/d Hgb >120 g/L | Availability of potable water: a 3-d supply of 1 gal (4L)/person/d as recommended by EPA is available | Food intake: Food consumption reported to be <50% of meals. Reduced intake progresses throughout the day with fatigue and increased signs/symptoms of dysphagia. Weight loss: 7 lb (3.2 kg) in past month (5% weight loss) Measured Weight: 148 lb (67 kg) Nutrition-focused physical findings: Mild/moderate loss of muscle mass Diet: Minced and moist Comparative standards: Total estimated energy needs in 24 h: 1,500 kcal (6,300 kJ), Total estimated protein needs in 24 h: 80 g protein/d Method for estimating total energy needs: Mifflin-St Jeor | Energy intake: >2,200 kcal/d, (9,200 KJ/d) Age: 45 y Stated height: 5 ft 5 in (163 cm), Stated weight: 190 lb (86 kg) Body mass index: 32.4, Obese. Meal snack pattern: Eats when not hungry. Types of food meals: High-fat foods frequently, Weight gain: 60 lb (27 kg) in 24 mo, Readiness to change nutrition related behavior: Contemplation, expresses concern about health status Comparative standards: Total estimated energy needs in 24 h: 1,500 kcal (6,300 kJ), Method for estimating total energy needs: Mifflin-St Jeor |

Weight Management RDN validates assessment data received from hospital RDN via a Transition of Care (C-CDA) document. (In practice this means that all data from the acute care setting (acute care case in this Figure) were transmitted as documented to the nonacute care setting.)

(continued on next page)
### Case NCP

**Public Health Situation:** Women of reproductive age found with low Hgb\(^a\) and iron-deficient diet

**Foodservice Situation:** In a natural disaster, it is estimated that 5 d are needed to repair and restore potable water supply

**Long-Term Care Situation:** Daughter of personal care home resident concerned with mother’s food intake. Resident has swallowing difficulties

**Acute Care Situation:** Hospitalized female teacher with complaint of undesired weight gain. Reason for admission: emergency appendectomy

**Nonacute Care Situation:** Female teacher with complaint of undesired weight gain referred by hospital RDN\(^b\) (Same person as in Acute Care)

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### Diagnosis P:

**Inadequate mineral intake: Iron**

- related to infrequent consumption of iron-rich foods
- as evidenced by low dietary iron consumption (<67% EAR) and low Hgb (<120 g/dL) in 40% of women of reproductive age

**Limited access to potable water**

- related to lack of disaster planning as evidenced by <5 d supply of 1 gal (4 L) /person /d

**Malnutrition**

- related to inadequate oral intake as evidenced by resident consuming <50% of meals, 5% weight loss, evidence of muscle wasting (SGA\(^b\) B) and reports of fatigue and dysphagia

**Excessive energy intake**

- related to consuming high-fat foods when not hungry as evidenced by unintended weight gain of 60 lb (27 kg) in 24 mo and energy intake exceeding total estimated energy needs by 700 kcal/d (2,900 kJ/d)

**Undesirable food choices**

- related to consuming high fat foods when not hungry as evidenced by unintended weight gain of 60 lb (27 kg) in 24 mo and energy intake exceeding total estimated energy needs by 700 kcal/d (2,900 kJ/d)

### Intervention

**Mass communication** to promote **Food environment change** in Communities, neighborhoods and families sector.

- Goal: 50% Reduction in anemia in women of reproductive age\(^a\)

**Team meeting:**

- with food production manager, water vendors, materials manager to plan action points
- Goal: 5-d Supply potable water to provide 1 gal (4 L)/d/person

**Nutrition Prescription:**

- 1,500 kcal 80 g protein/d, puréed diet, Meals and snacks: Puréed food Level 4 Green, Moderately thick liquid Level 3 Yellow
- Food and Nutrient Delivery: Change diet order to puréed with fortified foods and between-meals snacks. Implement medication nutrition supplement pass program.
- Collaboration with other providers: Nursing to monitor tolerance to puréed diet

**Nutrition prescription:**

- 1,600 kcal/d (6,700 kJ/d), Health belief model, Motivational interviewing, Referral to RDN with different expertise.
- Goal: Make appointment with weight management RDN before discharge

**Nutrition prescription:**

- 1,600 kcal/d (6,700 kJ/d), Social learning theory, Goal setting, Recommended modifications: lower-fat snack choices.
- Goal: Altered eating habits result in weight loss of 5% of current body weight

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*(continued on next page)*
<table>
<thead>
<tr>
<th>Case</th>
<th>NCP</th>
<th>Foodservice</th>
<th>Long-Term Care</th>
<th>Acute Care</th>
<th>Nonacute Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situation:</td>
<td>Women of reproductive</td>
<td>Situation: In a natural</td>
<td>Situation: Daughter of personal care</td>
<td>Situation: Hospitalized female</td>
<td>Situation:</td>
</tr>
<tr>
<td>age found</td>
<td>age found with low Hgb*</td>
<td>disaster, it is estimated</td>
<td>home resident concerned with mother’s</td>
<td>teacher with complaint of</td>
<td>Female teacher</td>
</tr>
<tr>
<td>with low</td>
<td>and iron-deficient</td>
<td>that 5 d are needed to</td>
<td>food intake. Resident has swallowing</td>
<td>undesired weight gain referred by</td>
<td>with complaint</td>
</tr>
<tr>
<td>Hgb and</td>
<td>diet</td>
<td>repair and restore</td>
<td>difficulties</td>
<td>hospital RDN¹</td>
<td>of undesired</td>
</tr>
<tr>
<td>iron-deficient diet</td>
<td></td>
<td>potable water supply</td>
<td></td>
<td>(Same person as in Acute Care)</td>
<td>weight gain</td>
</tr>
</tbody>
</table>

### Monitoring and evaluation

| Food intake, Mineral element intake, Nutritional anemia profile: Hgb: After 3 y, modestly increased consumption of iron-rich foods (<EAR) and incidence of low Hgb (Hgb < 120 g/L) not trending toward reduction. Program modified Indicator: Dietary intake of iron Criterion: > EAR Indicator: Hgb Criterion: Hgb > 120 g/L | Availability of potable water: Water supply of 1 gal (4 L)/person/d for 5 d achieved Indicator: Water supply Criterion: at least 1 gal (4 L)/person/d for 5 d | Food intake, Diet Order: Meal observation by nursing reports tolerance and acceptance of diet. Fluid/beverage intake: 95% consumption of commercial (prepackaged) beverage Weight change: weight gain 3% Indicator: Percent intake of served meals snacks, and beverages Criterion: at least 95% Indicator: Weight gain Criterion: weight gain by 3% |

### Readiness to change nutrition related behavior: made appointment with weight management RDN before discharge Indicator: Adherence Criterion: Make appointment with weight management RDN

### Body mass index, Meal snack pattern, Types of food meals. Eating fruit and whole grain snacks when hungry, weight reduction, confident of ability to continue Indicator: Body mass index Criterion: Body mass index < 31.7 Indicator: weight reduction Criterion: 5% weight reduction of current body weight

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*aHgb = hemoglobin.  
*bRDN = registered dietitian nutritionist.  
*EAR = Estimated Average Requirement.  
*eC-CDA = Consolidated Clinical Document Architecture.  
*fPES = Problem, Etiology, Signs, and Symptoms.  
*gSGA = Subjective global assessment.  

Figure 3. (continued) Terminology applications in a variety of practice settings. Nutrition Care Process Terminology terms are presented in boldface italic type.
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Quality, cost-effective nutrition care delivered in partnership with providers, agencies, and communities</td>
<td>Nutrition is an essential component of high quality health care for promotion of health and prevention of disease</td>
<td>Health care consumers</td>
<td>Safe, effective, efficient, person-centered, timely, and equitable nutrition care delivered in collaboration with providers, agencies, and clients</td>
</tr>
<tr>
<td>Nutrition care grows nationally</td>
<td>Data are needed to research the process and outcomes of nutrition care</td>
<td>Academy members</td>
<td>Nutrition care improves the health and well-being of all people</td>
</tr>
<tr>
<td>Standardized nutrition language included in dietitian education</td>
<td>Nutrition and dietics professionals, educators, and researchers will use and enhance a standardized nutrition language</td>
<td>Academy BOD</td>
<td>Standardized nutrition language integral to nutrition and dietetics education</td>
</tr>
<tr>
<td>Ongoing maintenance and updates of standardized terminology accomplished by the Academy and/or partners</td>
<td>Nutrition and diets professionals, educators, and researchers use standardized terminology in a database to perform outcomes management and targeted research</td>
<td>Other health care providers</td>
<td>Robust maintenance and updates of standardized terminology accomplished by Academy and its global partners</td>
</tr>
<tr>
<td>Evaluate a national data warehouse established for a sustainable, reliable and useful database for Academy/dietitians/researchers</td>
<td>Nutrition and dietetics professionals improve effectiveness through collaboration</td>
<td>Health care payers</td>
<td>Popularize a sustainable, reliable, useful database for Academy and nutrition and dietetics research and innovation</td>
</tr>
<tr>
<td>National, state, and local policies developed and supported to foster nutrition practice, education, and research</td>
<td>Emphasis on people-centered, value-based health care</td>
<td>Legislators and regulators</td>
<td>Jurisdictional policies developed and supported to foster nutrition practice, education, and research</td>
</tr>
<tr>
<td>Incorporate NCP and International Diets and Nutrition Standards</td>
<td></td>
<td>Health care researchers</td>
<td>Support adoption of NCP and NCPT into nutrition and dietetics practice worldwide</td>
</tr>
<tr>
<td>Language in to dietetics practice worldwide</td>
<td></td>
<td>International nutrition and dietetics professionals and organizations</td>
<td>NCPT is the essential element linking technological innovations, and achieving interoperability in nutrition and dietetics at large</td>
</tr>
</tbody>
</table>

\( ^a \)Academy = Academy of Nutrition and Dietetics.
\( ^b \)NCP = Nutrition Care Process.
\( ^c \)BOD = Board of Directors.
\( ^d \)HOD = House of Delegates.
\( ^e \)NCPT = Nutrition Care Process Terminology.

Figure 4. Logic Model for standardized terminology. The goal is to provide data to foster nutrition and dietetics practice, education, research, and policy.
FROM THE ACADEMY

reported the use of IDNT. Recently, the nutrition diagnosis terms of NCPT were mapped to the International Classification of Diseases as part of a national project in Norway. 26 Japan and South Korea also adopted the IDNT. 27,28 A recent global survey of NCP/NCPT adoption and use has been completed and the results are being prepared for publication (personal communication with Elin Lovestam, June 5, 2018). From the Academy’s Professional Assessment Survey, there is increasing trend of use of Academy resources related to NCP and NCPT from 2007 to 2017 (NCPROC Committee face-to-face meeting, June 5, 2017). In this survey, 20% of respondents use NCPT in structured EHRs (predefined data elements to select from), 45% in unstructured (free-text) EHRs, and 30% is a combination of structured and unstructured documentation (NCPROC Committee face-to-face meeting, June 5, 2017). These data reflect that a large portion of practitioners are still documenting electronically in free-text fields. It is important to acknowledge that upgrading EHR technology to structured form is a major and challenging change that requires resources and vested stakeholders. Academy survey data integrated with the awaited international survey will assist in developing global strategies for NCP/NCPT use and adoption.

Difficulties and challenges of implementing the NCPT have been identified by several studies. Challenges with implementation have included increased time requirement to use NCPT, concern that other health professionals will not read nutrition diagnosis statements, limited number of translations, concern that translation or dialects may lead to misinterpretations of the terminology, and patient-centered experience data may not be captured effectively (NCPROC Committee face-to-face meeting, July 13, 2017). 11 Results from a qualitative study found that Swedish dietitians expressed ambivalence toward the terminology in that some terms, especially in the environmental-behavioral domain of the Nutrition Diagnosis terminology, were harsh or offensive toward patients. 14 These surveys support that implementation strategies should include education and training, incorporation of terminology into documentation tools for health records, and culturally sensitive translation. Change-management skills and leadership support are also needed for successful implementation. 29,30

Development and Submission Process

The NCPT communicates the profession’s unique contribution to health care. The terminology grew from 62 Nutrition Diagnosis terms in 2006 to 712 NCPT terms in 2008. There are currently about 1,700 terms (Figure 2) defining the four steps of the NCP. The terminology has globally evolved from principles and initiatives to acknowledge community and public health nutrition and other specialty practices, and to achieve inclusion into standardized EHR terminologies (Figure 5). Ongoing work to maintain the terminology for an ever-changing profession is possible because of the valuable contribution of practitioners and content experts and the improved process by which terms are developed.

Throughout the early development process, the Standardized Language Task Force sought term suggestions from practitioners and subject matter experts. Forms were included within the IDNT books to encourage term submission from users of the terminology. Term submitters provided a term definition, reference sheet, and supporting evidence. Term refinement was a collaborative process between submitters and an expert terminology consultant. The expert terminology consultant also provided a recommendation for placement of the term within the terminology structure. This completed work was submitted to the committee for inclusion in the terminology.

The submission process was modified in 2014 to streamline the involvement of NCPROC, its supporting workgroups, and an expert terminology consultant. The revised process evaluates term requests and modifications from groups of subject matter experts such as Academy dietetic practice groups, Academy leaders, and NCPT users. 31

Some important changes to the submission process include an initial review by the NCPROC to assess the term’s merit in nutrition and dietetics practice before allocating consulting time or obtaining a review by the Classification Workgroup to determine whether a proposed or modified term already exists in an international clinical terminology standard such as SNOMED-CT and LOINC. If a term is progressed to the Classification Workgroup and is found to already exist in an international clinical terminology standard, the term may be readily adopted without additional development.

If a proposed term is progressed to the Classification Workgroup and is not found in existing international clinical standards, then development work may be needed. When expert agreement is reached on the proposed content, terms are approved by the NCPROC for inclusion in the next release of the NCPT. 31 Term and definition development is a consensus among experts or expert practice groups that reflects current nutrition and dietetic practice and research.

Recent examples of this approach includes terms describing the etiology and severity of adult and pediatric malnutrition, International Dysphagia Diet Standardization Initiative terms, terms to support the Nutrition-Focused Physical Examination, and the Population-Based Nutrition Action intervention terms (Figure 5).

With the increase in international NCPT use, NCPROC was restructured to ensure half the membership was based internationally. Likewise, the NCPROC Advisory Workgroup, International Workgroup, and Classification Workgroup contribute a global talent pool of subject matter experts. Thus, the NCPT evolves with new and revised term requests from a dynamic, international profession.

Translation

The eNCPT has been translated from US English into seven languages and dialects. 10 The translations are available to all eNCPT subscribers. The Academy collaborates with international professional organizations such as associations and or universities, and their translating team entities (eg, collaborators, consultants, or other appointed professionals) in an effort to make the NCPT a global language with international usage. 32 Sweden completed its translation in 2011 and has subsequently completed four updates. Experiences from Sweden have shown the importance of
<table>
<thead>
<tr>
<th>Principles and initiatives</th>
<th>Select NCPT examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflect an international perspective</td>
<td>International leaders, experts, and reviewers are integral to the NCPT maintenance and Committee processes. US and international standards are included in resources for: • Measures • Laboratory units • Nutrient intake</td>
</tr>
<tr>
<td>Reflect an international perspective</td>
<td>NCP and NCPT are used in several countries. Definitions are developed to incorporate new NCPT into standardized terminologies and for accurate conceptual translation. The NCPRO Committee collaborated with the International Dysphagia Diet Standardisation Initiative to develop NCPT diet terms and definitions so that the Academy could submit them to standardized terminologies.</td>
</tr>
<tr>
<td>Take a people-centered approach</td>
<td>New term synonyms were deemed necessary for terminology considered overly judgmental.</td>
</tr>
<tr>
<td>Recognize the etiology and severity of malnutrition (undernutrition)</td>
<td>Malnutrition was reclassified as a clinical condition with movement of the nutrition diagnosis from the Intake domain to the Clinical domain for more accurate modeling of these conditions. Malnutrition indicators from the Academy consensus papers for adults and pediatrics have been included in the NCPT reference material.</td>
</tr>
<tr>
<td>Characterize nutrition interventions in populations</td>
<td>Nutrition interventions at the institutional, community, and policy levels describe actions to address nutrition problems influenced by the environment in which people live, work, and play. Fully integrating the Social Ecological Model, a new Nutrition interventions domain, aligned the NCPT with the Centers for Disease Control and Prevention Health Impact Pyramid and the World Health Organization Population Health Promotion Model, which was adopted in the Ottawa Charter on Health Promotion.</td>
</tr>
<tr>
<td></td>
<td>Population-based nutrition action</td>
</tr>
<tr>
<td></td>
<td>• Social ecological model • Social marketing • Mass communications • Food environment change • Public policy change • Food production and provision settings • Government settings • Agriculture sector • Communities, neighborhoods, families sector</td>
</tr>
</tbody>
</table>

Figure 5. Major principles and initiatives of Nutrition Care Process Terminology (NCPT).
<table>
<thead>
<tr>
<th>Principles and initiatives</th>
<th>Select NCPT examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Represent content for specialized practice</strong></td>
<td>Practitioner-led efforts to reflect their practice and research with neonatal, long-term care, inborn errors of metabolism, gastrointestinal disorder, and community nutrition and public health populations are included in NCPT adding 781 assessment/monitoring and evaluation terms, 107 diagnosis, and 326 intervention terms since all 4 steps were published in IDNT in 2008.5</td>
</tr>
<tr>
<td><strong>Clarify usage of terminology</strong></td>
<td>The NCPRO Committee has responded to practitioner concerns and questions by: ● Providing guidance for diagnoses associated with exocrine and endocrine functions, ● Relocating an indicator for gluten from a carbohydrate to a protein diagnosis because of the protein in gluten responsible for the intolerance or allergy, and ● Defining predicted nutrition diagnoses that are anticipated based on observation, experience, or scientific reason.</td>
</tr>
</tbody>
</table>
| **Structure unique nutrition data** | Removing the need for hierarchical terminology construction by creating complete terms and submitting them to standardized terminologies (ie, SNOMED CT and LOINC), each term is assigned a 5-digit Academy unique identifier.20,21 This facilitates data tracking in electronic record systems. While all terms in nutrition diagnosis and intervention have external mappings, work continues in assessment. Ambiguous terms, such as suboptimal and less than optimal, have been replaced with more accurate labels. Terms that conveyed more than 1 idea have been separated for independent expression.

- Breastmilk feeding attempts in 24 h
- Docosahexaenoic acid estimated intake in 24 h
- Total fat from intravenous fluids
- Total protein per kilogram estimated in 24 h
- Phenylalanine, dried blood spot
- Pressure injury of hip
- Excessive growth rate
- Consistent carbohydrate diet
- Modify composition of parenteral nutrition
- Modify route of parenteral nutrition
- Altered gastrointestinal function
- Impaired nutrient utilization
- Intake of types of proteins inconsistent with needs
- Predicted inadequate energy intake
- Predicted breastfeeding difficulty
- Predicted food medication interaction
- Potassium estimated intake in 24 h
- Serum potassium measurement
- Inadequate potassium intake
- Potassium modified diet
- Potassium supplement therapy
- Estimated potassium needs
- Growth rate below expected
- Intake of types of fats inconsistent with needs (specify)
- Limited access to food
- Limited access to potable water
- Measured weight
- Stated weight
- Loss of subcutaneous fat overlying the ribs

Figure 5. (continued) Major principles and initiatives of Nutrition Care Process Terminology (NCPT).
creating a work group of experienced dietitians as well as having an ongoing dialogue and consensus building among the key contacts (expert dietitians with varied practice experiences and other health care professionals) involved in the translation. To be useful to nutrition and dietetics practitioners, a conceptual translation that is accurate, unambiguous, linguistically correct, and consistent is needed. Translating challenges include differences in culture, health care systems, legal issues, differences in the use of nutrition and dietetics terms, and references to US-specific concepts in the terminology. Conceptual translation is facilitated by clear definitions and supporting reference standards.

The Academy welcomes translations of the eNCPT. To obtain acceptance from the Academy to translate, translators need support from their national dietetics association or equivalent professional governing entities or university. The responsibility for the quality of the translation and associated costs lie with the Academy to translate, subsequent maintenance, and access to the eNCPT. I loinc=Logical Observation Identifiers Names and Codes.

**Figure 5.** (continued) Major principles and initiatives of Nutrition Care Process Terminology (NCPT).
Leadership and cultural transformation are part of the patient-centered care journey. In countries where clients have full access to their health record, it is very important to use terminology that is not perceived to be harsh or offensive. There is greater recognition for the need of people to be considered as individuals with varied needs and not as clinical symptoms. The choice of words used during an episode of care ought to reflect this philosophy. A psychologist’s view regarding successful use of standardized language is that it should correspond to situations in practice, have internal coherence, and intuitive appeal to users.

The provision of care and the language describing that care needs to be respectful and responsive to individual preferences and values. With the global adoption and implementation of NCPT, the terminology needs to communicate the care provided to culturally and linguistically diverse populations. Feedback from international surveys has indicated the desire for terms that are more patient-centered. The 2014 Australian NCPT Implementation Survey showed improvement in NCPT attitudes, knowledge, and use over time. In that longitudinal survey, free-text comments were collected to understand the challenges or barriers related to NCPT use, in particular areas of practice. The dietitian respondents’ comments included general sentiments such as, “I would cringe to write...,” “Some of the terminology is quite derogatory of the client/patient,” “An impersonal way of describing an interaction” and, “Culturally words have slightly different meanings. I change some words when I deem the language judgmental.”

Synonym submissions from New Zealand have provided alternatives to the words deficit and inability. Specifically, “Self-monitoring deficit,” “Food and nutrition-related knowledge deficit” and, “Inability to manage self-care” are examples of terms that could make an individual feel pessimistic, discouraged, or embarrassed. An individual’s personal strengths and capability may be overshadowed by a perceived critical expression. The synonym limited for inability is less judgmental, more empathetic, and is constructive with a positive regard for the individual. Utilizing the term submission process, a number of synonyms for diagnostic terms within the Behavioral-Environmental Domain were approved and included in the 2016 eNCPT release (Figure 6). Synonyms can be used interchangeably in place of the original term without altering the meaning.

### Behavioral and Environmental Domain

<table>
<thead>
<tr>
<th>NCP Term</th>
<th>Synonym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited food and nutrition-related knowledge deficit</td>
<td>Limited food and nutrition-related knowledge deficit</td>
</tr>
<tr>
<td>Self-monitoring deficit</td>
<td>Limited self-monitoring</td>
</tr>
<tr>
<td>Undesirable food choices</td>
<td>Unbalanced diet</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>Limited physical activity</td>
</tr>
<tr>
<td>Inability to manage selfcare</td>
<td>Limited ability to manage self-care</td>
</tr>
<tr>
<td>Impaired ability to prepare food/meals</td>
<td>Limited ability to prepare food/meals</td>
</tr>
</tbody>
</table>

**Figure 6.** Nutrition Care Process (NCPT) Terminology-approved synonyms can be used interchangeably in place of the original term without altering the meaning of the term. NCP = Nutrition Care Process.
Interoperability is fundamental to the terminology standard and ensures that NCPT communicates the same meaningful information and significant facts in SNOMED-CT or LOINC. The resulting database and available nutrition standards are used by developers to match accurately NCPT to SNOMED-CT or LOINC terms when designing an EHR. This may not appear as a point of interest to nutrition and dietetics professionals at first. However, in EHRs the NCPT is what the user sees and uses upfront when they document and in the back end are the SNOMED terms. EHRs store SNOMED data for later reporting and research. Thus, this matching between NCPT and SNOMED is a necessary foundation to be able to conduct large-scale quality improvement such as reporting on electronic quality measures, and/or NCP-related research. Professionals are encouraged to advocate for NCPT matching to SNOMED at their workplace EHR and work proactively with information technology staff to make this happen.

Inclusion of NCPT in the clinical terminology standards facilitates representation of NCPT in electronic health information management standards such as those of HL7. This representation is fundamental to the interoperability of electronic health data and records. Interoperability aims to provide a seamless, secure flow of meaningful electronic information to improve care (Figure 7).

To foster nutrition care across care settings in the United States, the Academy provides routine input on nutrition informatics developments and related needs to the Federal Office of the National Coordinator for Health Information Technology. This input is aimed to update the Interoperability Standards Advisory, an Interoperability Standards Advisory. A recent major development is the revision of the Electronic Nutrition Care Process Record System (ENCPRS) for international use. The ENCPRS is a functional electronic health data management standard available from HL7 that defines the necessary content and messaging for nutrition and dietetics-related documentation. ENCPRS relies on NCP and NCPT for content. Also, in the United States, work is underway to develop an HL7 standard for transition of care documentation that includes templates for describing nutrition care plans using NCP and NCPT. Terminology standards and data management are essential structures to ensure interoperability among EHRs (Figure 7).

NCPT IN RESEARCH

The NCPT as a structured terminology has begun to demonstrate its utility in providing data for research (Figure 4). As described in the NCP model update, a data aggregation platform, the Academy of Nutrition and Dietetics Health Informatics Infrastructure (ANDHII), the architecture of which contains the NCPT, was used in studies to “explore the feasibility of validating malnutrition diagnostic criteria” and “investigate the influence of evidence-based nutrition practice guidelines for the prevention of diabetes on both practice patterns and patient outcomes.” ANDHII is forging new frontiers globally. ANDHII is being increasingly used in nutrition research, education, and clinical and public health settings in the United States and around the world. This web-based NCPT tool can be especially helpful in settings where the EHR is not structured yet to capture nutrition care and/or in public health settings where a nutrition-focused evaluation framework is needed. Educators use ANDHII to teach future clinicians in classrooms, internship settings, and/or student-led clinics. ANDHII-focused activities empower students to enhance their informatics skills, apply their NCPT in practice settings, and monitor the efficacy of their work. Other data aggregation tools that contain NCPT content can also be employed in research or quality improvement projects. Leveraging the
data derived from NCPT is an avenue to demonstrate effectiveness of nutrition and dietetics care.

GOING FORWARD
The adoption and consistent use of the NCPT promotes and strengthens nutrition communications among health professionals, their clients, and other customers. Several of the 2008 aspirations and goals for the NCPT have been realized (Figure 4). These include the incorporation of NCPT into EHRs and standardized clinical terminologies to communicate nutrition care. Also, expansion and revisions have occurred due to changes in the field of nutrition and dietetics. The role of NCP and NCPT in informatics is now better appreciated as NCPT becomes a part of clinical terminology and electronic health information management standards. The high interest in international translation, adoption, and enhancement of NCPT continues to grow. Further development of the NCPT in the areas of diagnosis etiology, nutrition assessment and monitoring, and evaluation status is needed. Standardization of etiologies will help reveal which types of interventions effectively resolve specific etiologies, a key part of diagnosing. This is important because the same nutrition problem can have a different etiology. Also, standardized labels for status have not been established, but these are needed because care providers and institutions use different ways to document status.

Research efforts to validate the terminology are needed. Validation improves the quality of the terminology and ensures that the terminology is used appropriately. The NCPM includes guidance “to research the NCP.” Some work has been done toward validation of NCP terms in the United States. One study has tested the content validity of diagnostic terms using a convenience sample of registered dietitians (RDs). Another study measured the reliability of nutrition diagnosis terms among RDs. Finally, investigations have focused on the validation of nutrition diagnoses used by RDs specializing in cancer, pediatrics, and gerontology. These investigations were in agreement that some refinement of the evaluated nutrition diagnoses may be warranted. An additional consideration for research is NCPT acceptance by clients and other health care providers.

The need for structured diagnosis etiologies in the NCPT is being explored. Recent research demonstrates that there is little agreement in etiology selection among professionals when assessing nutrition-related data from the same client. A specific nutrition diagnosis term may be related to a variety of etiologies. It is the etiology that primarily determines the intervention to resolve or mitigate nutrition diagnoses. Being able to link nutrition diagnosis etiologies or etiology categories and efficacious interventions would be useful in practice. Descriptors that define the status of diagnosis resolution are being developed.

The documentation of the intervention step needs to be further refined. The intervention consists of the plan and the implementation. The plan (which includes the nutrition prescription and goals) and the implementation of the plan could be further defined, structured, and quantified to assist professionals in designing measurable and comparable interventions. Also, defined scales to monitor effectiveness of an intervention is being considered for inclusion in the NCPT. Such progress in the terminology will facilitate outcomes research in a substantive way.

The need for ongoing professional education and training is important to highlight. Earlier cited surveys on the usage and adoption of the NCPT indicate that even countries with long-standing implementation, such as the United States, can improve the utilization of NCPT. Hence, education efforts in the future will not only target students, but also practicing and returning practitioners. Collaborative professional networks, also known as Communities of Practice and continuously updated experiential training delivered by NCP/NCPT certified trainers can be important methods to effectively reach and support a broad number of professionals. Through interactive educational methods, where learning takes place through connections formed among colleagues, learners can expand their connections and these connections drive new learning and decision making. Interprofessional education that incorporates nutrition and dietetics also warrants consideration.

CONCLUSIONS
Over the past decade, the Academy has successfully pioneered a standardized terminology to communicate the NCP performed by nutrition and dietetics practitioners. NCPT has been adopted, implemented, and enhanced by international professionals and organizations. NCPT has been embraced by terminology and health information management standards. The terminology has grown to include specialty practices and varied practice settings as well as culturally sensitive synonyms. NCPT growth is supported by a responsive process to accommodate new terms that address inevitable practice changes. Research tools have been created to explore NCPT implementation, its utility in describing the value of nutrition and dietetics practice, and the effectiveness in communicating quality practice that improves the health of communities. The need for training and continuing education regarding NCP and NCPT is ongoing. NCPT has become internationally essential to the field of nutrition and dietetics, intersecting technology, practice, and research for innovation and discovery.

References


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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

C. Papoutsakis is an employee and D. G. Pertel is a consultant, Academy of Nutrition and Dietetics, Chicago, IL, which has a financial interest in the Nutrition Care Process Terminology.

FUNDING SUPPORT

The Academy of Nutrition and Dietetics is the source of funding for the present update on the Nutrition Care Process Terminology. The authors and experts who conducted the update on the Nutrition Care Process Terminology had complete autonomy during all stages of the update and writing of the present manuscript.

AUTHOR CONTRIBUTIONS

All authors made substantial contributions to the conception of the work, co-drafted the initial draft, and revised it critically for important intellectual content. W. I. Swan and C. Papoutsakis edited the manuscript post review.