

Physician-nutrition-specialist track: if we build it, will they come?<sup>1-5</sup>

Douglas C Heimburger and the Intersociety Professional Nutrition Education Consortium

**ABSTRACT** The Intersociety Professional Nutrition Education Consortium (IPNEC) has made substantial progress in its first 2 y. With support from 9 participating nutrition societies and certification organizations and with funding from the National Institutes of Health and several nutrition industry partners, a sustained, functioning consortium has been established. The consortium's 2 principal aims are to establish educational standards for fellowship training of physician nutrition specialists (PNSs) and to create a unified mechanism for certifying physicians who are so trained. Its long-term goals are to increase the pool of PNSs to enable every US medical school to have at least one PNS on its faculty and to surmount obstacles that currently impede the incorporation of nutrition education into the curricula of medical schools and residency programs. The consortium formulated and refined a paradigm for PNSs, conducted a national role delineation survey to define the scope of the discipline of clinical nutrition, and developed a preliminary curriculum template for training PNSs that can be completed in a minimum of 6 mo. IPNEC and its sponsoring societies are strategically positioned to play an important long-term role in nutrition education for physicians. We intend to continue soliciting broad input, especially from directors of fellowship training programs in nutrition and closely related subspecialties; to develop the core content for fellowships in nutrition and related subspecialties; and to initiate a unified PNS certification examination. *Am J Clin Nutr* 2000;71:1048-53.

**KEY WORDS** Medical nutrition education, physician nutrition specialist, certification, Intersociety Professional Nutrition Education Consortium

**INTRODUCTION**

The progressively stronger scientific recognition of the importance of nutrition and diet to health (1, 2) coupled with a sustained and increasingly sophisticated public interest in reliable nutrition information mandates that all physicians, especially primary-care physicians, be conversant with key aspects of clinical nutrition. This requires that all medical schools and residency programs develop the capability to teach nutrition to their students and ensure that it is, in fact, taught. Despite this, only a minority of medical students and residents receives adequate training in nutrition—a situation that has not changed since it was documented in the 1980s (3-6).

Studies of nutrition education in medical schools and residencies have established that the presence of qualified and active

physician nutrition specialists (PNSs) is critical to effective nutrition teaching (5-8). Indeed, an inadequate number of nutrition-oriented physician role models appears to be the major constraint in teaching nutrition to residents, regardless of specialty (7). The American Society for Clinical Nutrition's Committee on Clinical Practice Issues in Health and Disease reported that there is a vital clinical and educational leadership role for physicians specializing in nutrition in medical school-affiliated training programs (9). The Committee recommended that each academic medical center should have on its faculty at least one, and optimally more than one, PNS with full-time responsibility for nutrition education, to create the necessary learning environment.

Important obstacles impede the needed increase in the pool of PNSs who can fill these roles (10). Among these obstacles are an insufficiently defined PNS career track, including a lack of consensus standards for training (11) and certifying PNSs; inadequate institutional support for PNS faculty positions; poor reimbursement for important components of clinical nutrition practice (eg, obesity management); and the general disease-treatment orientation of modern medicine, as opposed to health promotion and disease prevention. Subspecialty nutrition training is available to physicians, but the number of training programs is small, their orientations vary somewhat, and they typically receive few applications (12).

To encourage the nutrition societies to unite in addressing these issues, the Intersociety Professional Nutrition Education Consortium (IPNEC) was founded in 1997 (10). The consortium's principal aims are to establish educational standards for fellowship training of PNSs and to create a unified mechanism to certify them (**Table 1**). Its long-term goals are to increase the pool of PNSs to enable every US medical school to have at least

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**TABLE 1**

Participating societies, representatives, and objectives of the Intersociety Professional Nutrition Education Consortium

|                             |   |
|-----------------------------|---|
| Director                    | Douglas C Heimbarger (University of Alabama at Birmingham)  |
| Codirector                  | C Michael Brooks (University of Alabama at Birmingham)  |
| Task-force chairs           | Virginia A Stallings, Training Task Force (Children's Hospital of Philadelphia)<br>Virginia M Herrmann, Assessment Task Force (Washington University, St Louis)   |
| Society representatives     | American Board of Nutrition: Douglas C Heimbarger<br>American Society for Clinical Nutrition: Virginia A Stallings and M Molly McMahon (Mayo Clinic, Rochester, MN)<br>American Society for Parenteral and Enteral Nutrition: Virginia M Herrmann and James M Long III (Birmingham, AL)<br>National Board of Nutrition Support Certification: Wanda H Howell (University of Arizona, Tucson)<br>American College of Nutrition: Stanley Wallach (New York University, New York) and Craig J McClain (University of Kentucky, Lexington)<br>Certification Board for Nutrition Specialists: Michael Glade<br>North American Association for the Study of Obesity: Roland L Weinsier (University of Alabama at Birmingham)<br>American Society of Bariatric Physicians: Denise E Bruner (Arlington, VA)<br>American Dietetic Association: Jane White (University of Tennessee, Knoxville) and Margaret P Garner (University of Alabama, Tuscaloosa) |
| External Advisory Committee | Harry R Kimball (American Board of Internal Medicine)<br>Phillip P Toskes (University of Florida, Gainesville)<br>Walter W Tunnessen Jr (American Board of Pediatrics)  |
| Short-term objectives       | Develop a broad paradigm for physician nutrition specialists that may attract more physicians into the field<br>Establish educational standards for fellowship training of physician nutrition specialists<br>Implement a unified certification mechanism for physician nutrition specialists<br>Implement a system of governance necessary for long-term maintenance of the training standards and certification examination   |
| Long-term objectives        | Disseminate information about the training and certification processes<br>Increase interest among physicians for clinical nutrition training<br>Increase the pool of physician nutrition specialists, to enable every US medical school to have at least one on faculty<br>Surmount obstacles that impede the incorporation of nutrition education into the curricula of medical schools and primary-care residency programs  |

one PNS on its faculty and to identify and surmount obstacles that currently impede the incorporation of nutrition education into the curricula of medical schools and residency programs. These objectives are further outlined in Table 1.

One of IPNEC's first tasks was to develop a consensus paradigm for a PNS that clearly defines and distinguishes nutrition expertise and is likely to attract more physicians into the specialty. After several revisions, consensus was reached on the following definition of a PNS. "A PNS is a physician with training in nutrition who devotes a substantial career effort to nutrition and who can assume a leadership role in coordinating multidisciplinary clinical nutrition services and education in academic health centers, other medical centers, private practice, and other health care settings. PNSs generally have backgrounds in the specialties of internal medicine, pediatrics, family medicine, or general surgery, and sometimes in subspecialties such as gastroenterology, endocrinology, critical care, nephrology, or cardiology. They have completed a period of defined nutrition training, in addition to categorical residency training, that includes mastery of a defined core of knowledge and completion of a period of mentored clinical nutrition experience, which may be obtained in a nutrition fellowship or as part of training in another subspecialty."

Key features of this paradigm include the recognition that PNSs emanate from several medical specialties and subspecialties and that PNS training can be obtained as part of training in another subspecialty. There has not been, and will probably never be, a single disciplinary pathway through which all PNSs

enter clinical nutrition. The variety of settings within which PNS training can be obtained should make it accessible to a broad array of physicians.

#### ROLE DELINEATION SURVEY

To define fellowship training standards and develop a unified PNS certification examination, IPNEC conducted a survey of physicians in its member societies. The objective was to describe the backgrounds, training experiences, and practice settings of physicians who practice nutrition and to provide data to support content validity and to establish content specifications for training and certification of PNSs. A 93-item survey was distributed on 2 occasions, in May and June 1998, to 1392 physician members of the American Society for Parenteral and Enteral Nutrition, the American Society for Clinical Nutrition, the American College of Nutrition, the North American Association for the Study of Obesity, the Society of Teachers of Family Medicine Work Group on Nutrition, and Diplomates of the American Board of Nutrition. A total of 426 surveys, or 31% of the total, were returned.

#### Demographic information

Respondents of the role delineation survey resided in the following regions: New England and middle states (31%), midwest and north central states (27%), southeast and south central states (24%), western states (15%), and other (3%). Most (57%) of the respondents practiced in cities with a population >500,000, 23%



**TABLE 2**

Professional demographics of 426 respondents to the Intersociety Professional Nutrition Education Consortium's role delineation survey

|   | Value            |
|---|------------------|
|   | % of respondents |
| Specialty board certifications                                      |                  |
| Internal medicine   | 42               |
| Pediatrics  | 22               |
| Surgery   | 21               |
| Family practice   | 5                |
| Subspecialty board certifications                                   |                  |
| Gastroenterology  | 19               |
| Critical care   | 12               |
| Endocrinology   | 7                |
| Nephrology  | 2                |
| Cardiology  | <1               |
| Other   | 22               |
| Nutrition certifications  |                  |
| American Board of Nutrition   | 17               |
| National Board of Nutrition Support Certification                   | 10               |
| Certification Board for Nutrition Specialists                       | 2                |
| Commission on Dietetic Registration                                 | 1                |
| American Board of Bariatric Medicine                                | <1               |
| None  | 70               |
| Nutrition society memberships                                       |                  |
| American Society for Parenteral and Enteral Nutrition               | 66               |
| American Society for Clinical Nutrition                             | 47               |
| American College of Nutrition                                       | 21               |
| American Gastroenterological Association                            | 20               |
| Society of Critical Care Medicine                                   | 12               |
| North American Association for the Study of Obesity                 | 8                |
| American Dietetic Association                                       | 3                |
| American Society for Bariatric Physicians                           | 2                |
| North American Society for Pediatric Gastroenterology and Nutrition | 2                |
| Primary employer  |                  |
| Medical school  | 45               |
| Group practice  | 17               |
| Self-employed solo practice   | 13               |
| Nongovernment hospital  | 9                |
| Government  | 9                |
| Health maintenance organization                                     | 1                |
| Other and missing   | 6                |

in cities with a population of 100 000–500 000, and 17% in cities with a population <100 000 (3% missing responses). The respondents' specialties and subspecialties are listed in **Table 2**. Internists, pediatricians, and surgeons were well represented, but family practitioners were less well sampled. The major subspecialties were gastroenterology, critical care, and endocrinology; there were few nephrologists and cardiologists. About half of the critical care specialists were surgeons and most of the remainder were internists. More than half of the gastroenterologists reported a background in internal medicine and nearly half listed a background in pediatrics. Additional board certifications were held by 22% of the respondents, the most common being for geriatrics, neonatology, and preventive medicine.

Nutrition board and practice certifications held by the respondents are also shown in Table 2. Only 30% of the respondents had certification, principally those of the American Board of Nutrition and the National Board of Nutrition Support Certification. Nutrition society memberships reflect the mailing lists used to

conduct the survey, with the largest proportions belonging to the American Society for Parenteral and Enteral Nutrition, The American Society for Clinical Nutrition, and the American College of Nutrition. Substantial numbers also belonged to the American Gastroenterological Association, the Society of Critical Care Medicine, and the North American Association for the Study of Obesity. Many respondents belonged to  $\geq 2$  of the societies.

Formal nutrition training after medical school was reported by 56% of the respondents (22% had received 1–12 mo of training and 34% >12 mo of training), but 41% had completed no formal nutrition training (3% missing responses). Most of the respondents had substantial experience in medical practice: 59% had  $\geq 16$  y experience, 33% had 6–15 y experience, and only 7% had  $\leq 5$  y experience (1% missing responses). Experience in medical nutrition practice was also substantial: 48% had  $\geq 16$  y experience, 35% had 6–15 y experience, and 15% had 0–5 y experience (1% missing responses).

Although two-thirds of the respondents treated only adults, 24% treated predominantly children and 5% treated both adults and children. Fifty-two percent of the respondents worked primarily in university hospitals, 19% in community teaching hospitals, and smaller numbers in community nonteaching hospitals and ambulatory care settings. Although 45% were employed by medical schools, substantial numbers were in group or solo practices (Table 2).

About 92% of the respondents indicated at least some current effort devoted to nutrition; 35% devoted most of their time to nutrition (**Table 3**). Most of the respondents spent  $\leq 20\%$  of their effort on direct nutrition-related patient care and only 10% devoted most of their time to nutrition-related patient care. Of the physicians who provided direct nutrition-related patient care, 59% received some type of formal nutrition training after medical school and 30% had some type of nutrition certification. Of the physicians who spent >20% of their effort in direct nutrition-related patient care, 68% received some type of formal nutrition training after medical school and 40% had some type of nutrition certification.

Few respondents spent >20% of their effort on medical nutrition education, but 90% devoted at least some effort to medical nutrition education (Table 3). Of the physicians who devoted any effort to providing medical nutrition education, 59% received some type of formal nutrition training after medical school and 31% had some type of nutrition certification. Of the few physicians with >20% of their effort in this activity, 65% received some type of formal nutrition training after medical school and 22% had some type of nutrition certification.

### Role delineation

The survey instrument contained a list of 76 nutrition content items and clinical tasks that might be required by physicians engaged in nutrition care. Respondents were asked to provide their judgments regarding the importance of each content item and clinical task and the frequency with which they encounter it in their clinical practice. The items were divided into 9 categories. Importance was rated on the following 4-point scale: not important, 1; minimally important, 2; moderately important, 3; and very important, 4. Frequency was rated on the following 4-point scale: never, 1; infrequently (<3 times/y), 2; frequently (3–11 times/y), 3; and very frequently ( $\geq 12$  times/y), 4. The frequency variable was flawed because it elicited responses based on absolute numbers of encounters per year, and respondents were not asked to adjust their responses on the basis of their total

**TABLE 3**

Nutrition-related percentage effort of 426 respondents to the Intersociety Professional Nutrition Education Consortium's role delineation survey

| Effort  | Patient care            | Nutrition education | Overall |
|---------|-------------------------|---------------------|---------|
|         | <i>% of respondents</i> |                     |         |
| 0–20%   | 56                      | 81                  | 30      |
| 21–50%  | 30                      | 13                  | 30      |
| 51–80%  | 9                       | 2                   | 17      |
| 81–100% | 1                       | 0                   | 18      |
| Missing | 4                       | 4                   | 5       |

percentage nutrition effort. Thus, physicians who spend most of their time practicing clinical nutrition (although this was uncommon) would probably encounter relatively infrequent topics more times per year than would physicians who spend only 10% of their time practicing clinical nutrition. Because of this, frequency was given less weight than importance in the data analysis.

Descriptive statistics were generated with and without stratification for region, community size, formal nutrition training after medical school, years of experience in medical nutrition practice, percentage nutrition effort, practice population, and practice setting. Responses did not vary significantly across regions, community sizes, years of experience, percentage nutrition effort, or practice settings. As might be expected, items related solely to adult or pediatric practice populations were rated differently by persons serving those populations, especially with regard to frequency.

Decision rules developed by IPNEC members based on importance and frequency ratings and respondents' practice populations, duration of training, and percentage nutrition effort were applied to determine which of the 76 items should be included in a PNS content outline. This process eliminated 8 items. The 68 remaining items were then rank-ordered by the sums of their importance and frequency ratings and divided into quartiles. Items in the first quartile were given weights of 4, items in the second quartile weights of 3, items in the third quartile weights of 2, and items in the fourth quartile weights of 1. Each of the 9 categories was then given a composite weight from the weights of its individual items, and this was expressed as a percentage of the total weights of all the items. The individual items and their scores are shown in **Table 4**, in descending order of combined importance plus frequency, grouped into weighted quartiles.

The survey had  $\geq 3$  potential weaknesses, of which 2 were mentioned previously (possible underrepresentation of family practitioners and an inability to adjust the frequency variable for the percentage effort in clinical nutrition practice). Additionally, the content items may not have been worded to optimally capture disease prevention topics and activities. Judgments on the importance of these areas were probably embedded in responses to generically worded items, such as those related to lipids, vitamins, minerals, and obesity.

### PROPOSED PNS TRAINING STANDARDS

The survey results were then used to develop proposed consensus training standards for PNSs by using the format of the American Medical Association Graduate Medical Education Directory. IPNEC presents these to the nutrition community at large for review and comment.

### Eligibility for training

To be eligible to enter fellowship training in the subspecialty of clinical nutrition, IPNEC proposes that a physician must have completed categorical residency training. Although this will generally be in pediatrics, family medicine, internal medicine, or general surgery, physicians with other backgrounds may be considered. Schedules permitting, physicians who are enrolled in fellowship programs in subspecialties such as adult or pediatric gastroenterology, endocrinology, critical care, nephrology, or cardiology may pursue nutrition training integrated within their major subspecialty fellowship program.

### Program requirements for fellowship training in clinical nutrition

#### *Educational program*

A subspecialty education program in clinical nutrition must provide training and experience at a sufficient level for the fellow to acquire competency as a specialist in the field. IPNEC proposes that training must comprise a minimum of 6 mo of mentored clinical experience and formal instruction, either as a block or as an equivalent amount of time (1000 h) integrated among other duties over a longer time period. We emphasize that this should be considered a minimum duration; longer training should be undertaken when possible to provide optimal exposure. No less than 20% of the clinical experience should be gained in inpatient settings and no less than 20% in outpatient settings (eg, 1 d/wk over 6 mo or 0.5 d/wk over 1 y).

#### *Facilities and resources*

Modern facilities and services, including inpatient, ambulatory care, and laboratory resources, must be available and functioning. Specifically, there must be a complete biochemistry laboratory, interdisciplinary nutrition support service, indirect calorimetry equipment, body-composition assessment facility, dietary service, and medical and surgical intensive care unit.

#### *Specific program content*

*Clinical experience.* The training program must provide opportunities for fellows to develop clinical competence in the field of clinical nutrition. Clinical experience must include opportunities to observe and manage a sufficient number of new and follow-up inpatients and outpatients of all ages, including children and older adults, of both sexes and with a wide variety of common and uncommon nutrition-related disorders. The program must be supervised by physicians and care must be provided by an interdisciplinary team, such as a nutrition support service including registered dietitians, other appropriate health care professionals, or both. The program must include opportunities to function in the role of a clinical nutrition consultant for other physicians and services in both inpatient and outpatient settings.

Fellows should have formal instruction, clinical experience, or opportunities to acquire expertise in the evaluation, nutritional management, and prevention of the following disorders: malnutrition, obesity, eating disorders, diabetes mellitus, hypertension, cardiovascular diseases, dyslipidemias, gastrointestinal and liver disorders, cancer, renal disorders, osteoporosis, hematologic disorders, pulmonary disorders, and immune disorders (HIV infection and transplants).

**TABLE 4**

Ratings of nutrition content areas and clinical tasks

| Content area or clinical task  | Importance | Frequency | Combined |
|--|------------|-----------|----------|
| <b>Quartile 1</b>  |            |           |          |
| Fluid, energy, and nutrient requirements   | 3.72       | 3.64      | 7.36     |
| Laboratory data (general)  | 3.61       | 3.71      | 7.32     |
| Metabolism, absorption, and utilization of proteins and amino acids                      | 3.76       | 3.53      | 7.29     |
| Metabolism, absorption, and utilization of carbohydrates                                 | 3.72       | 3.56      | 7.28     |
| Indications and contraindications of enteral nutrition                                   | 3.80       | 3.43      | 7.23     |
| Comparison of enteral and parenteral nutrition   | 3.78       | 3.40      | 7.18     |
| Indications and contraindications of parenteral nutrition                                | 3.77       | 3.37      | 7.14     |
| Initiation, management, and discontinuance of inpatient enteral and parenteral nutrition | 3.74       | 3.34      | 7.08     |
| Medical history  | 3.55       | 3.52      | 7.07     |
| Diagnosis of protein-energy malnutrition   | 3.67       | 3.35      | 7.02     |
| Biochemical data (eg, serum proteins)  | 3.56       | 3.46      | 7.02     |
| Factors affecting body weight, composition, and energy balance                           | 3.54       | 3.44      | 6.98     |
| Diet history   | 3.53       | 3.43      | 6.96     |
| Gastrointestinal disorders   | 3.69       | 3.26      | 6.95     |
| Physical exam and anthropometry  | 3.51       | 3.42      | 6.93     |
| Measurement of energy intake   | 3.51       | 3.37      | 6.88     |
| Malabsorption and inflammatory gastrointestinal processes                                | 3.70       | 3.17      | 6.87     |
| Gastrointestinal physiology  | 3.48       | 3.38      | 6.86     |
| <b>Quartile 2</b>  |            |           |          |
| Metabolic complications of parenteral nutrition  | 3.73       | 3.13      | 6.86     |
| Calculation of nutrient composition of enteral and parenteral nutrition formulas         | 3.61       | 3.24      | 6.85     |
| Critical illness   | 3.78       | 3.01      | 6.79     |
| Physiologic complications of enteral nutrition   | 3.60       | 3.16      | 6.76     |
| Metabolic complications of enteral nutrition   | 3.65       | 3.10      | 6.75     |
| Wasting diseases (eg, cancer and AIDS)   | 3.64       | 3.10      | 6.74     |
| Requirements for macro-and micronutrients  | 3.47       | 3.26      | 6.73     |
| Mechanical complications of enteral nutrition  | 3.60       | 3.07      | 6.67     |
| Endocrine conditions   | 3.60       | 3.05      | 6.65     |
| Septic complications of parenteral nutrition   | 3.70       | 2.94      | 6.64     |
| Initiation and withdrawal of nutritional support   | 3.67       | 2.89      | 6.56     |
| Identification of nutrient deficiencies and toxicities                                   | 3.51       | 3.05      | 6.56     |
| Criteria of adequate diet, including recommended dietary allowances                      | 3.41       | 3.14      | 6.55     |
| Metabolism, absorption, and utilization of fiber   | 3.35       | 3.17      | 6.52     |
| Obesity  | 3.60       | 2.92      | 6.52     |

**TABLE 4 (Continued)**

| Content area or clinical task   | Importance | Frequency | Combined |
|---|------------|-----------|----------|
| Initiation, management, and discontinuance of home enteral and parenteral nutrition   | 3.60       | 2.90      | 6.50     |
| Major minerals: chemical properties, absorption, transport, metabolism, and functions | 3.44       | 3.05      | 6.49     |
| <b>Quartile 3</b>   |            |           |          |
| Dietary sources of macro-and micronutrients   | 3.38       | 3.10      | 6.48     |
| Cardiopulmonary illnesses   | 3.47       | 3.00      | 6.47     |
| Mechanical complications of parenteral nutrition                                      | 3.57       | 2.84      | 6.41     |
| Lipid absorption and transport  | 3.40       | 2.97      | 6.37     |
| Factors affecting circulating lipid concentrations                                    | 3.41       | 2.96      | 6.37     |
| Renal insufficiency and failure   | 3.53       | 2.78      | 6.31     |
| Hormonal control of nutrient metabolism   | 3.28       | 3.02      | 6.30     |
| Diagnosis of vitamin deficiencies and excesses  | 3.49       | 2.79      | 6.28     |
| Diagnosis of mineral and trace element deficiencies and excesses                      | 3.46       | 2.80      | 6.26     |
| Lipid classifications and properties  | 3.34       | 2.90      | 6.24     |
| Vitamins: chemical properties, absorption, transport, metabolism, and functions       | 3.39       | 2.85      | 6.24     |
| Major minerals: food sources and requirements   | 3.30       | 2.94      | 6.24     |
| Indications for special substrates  | 3.38       | 2.86      | 6.24     |
| Vitamins: food sources and requirements   | 3.29       | 2.80      | 6.09     |
| Drug-nutrient interactions  | 3.41       | 2.68      | 6.09     |
| Trace elements: chemical properties, absorption, transport, metabolism, and functions | 3.23       | 2.74      | 5.97     |
| Informed consent regarding nutritional support  | 3.34       | 2.59      | 5.93     |
| <b>Quartile 4</b>   |            |           |          |
| Nutrition and aging interactions  | 3.36       | 2.56      | 5.92     |
| Eating disorders  | 3.36       | 2.53      | 5.89     |
| Alternative nutrition therapies and supplements                                       | 2.99       | 2.76      | 5.75     |
| Physiology of hunger, satiety, and eating behavior                                    | 3.02       | 2.68      | 5.70     |
| Nitrogen balance  | 3.14       | 2.54      | 5.68     |
| Trace elements: food sources and requirements   | 3.03       | 2.56      | 5.59     |
| Growth and development  | 3.27       | 2.27      | 5.54     |
| Transplantation   | 3.24       | 2.27      | 5.51     |
| Influence of nutrition on work and exercise   | 3.12       | 2.38      | 5.50     |
| Calorimetry   | 3.06       | 2.40      | 5.46     |
| Nutritional requirements in early life  | 3.32       | 2.06      | 5.38     |
| Cultural and ethnic influences on nutrition   | 2.79       | 2.50      | 5.29     |
| Nutrition recommendations for adolescents   | 3.17       | 2.11      | 5.28     |
| Nutritional status and requirements in pregnancy and lactation                        | 3.32       | 1.92      | 5.24     |
| Counsel regarding infant and child feeding  | 3.21       | 2.03      | 5.24     |
| Dietary counseling in pregnancy and lactation   | 3.19       | 1.79      | 4.98     |

(Continued)



Fellows should have formal instruction, clinical experience, or opportunities to acquire expertise in the evaluation, management, and prevention of the following clinical problems: stress states, hypometabolic and starvation states, refeeding syndrome, drug-nutrient interactions, fluid and electrolyte management, interpretation of laboratory values, and nutritional access device problems.


*Technical and other skills.* The program must provide for instruction in the indications, contraindications, complications, limitations and, where applicable, interpretation of the following diagnostic and therapeutic techniques and procedures: nutritional assessment (medical history including diet, physical examination, and laboratory interpretation), methods for assessing energy expenditure and body composition, dietary counseling, feeding devices, and enteral and parenteral nutrition support in both inpatient and outpatient settings.

*Formal instruction.* The program must, at a minimum, ensure that fellows receive formal instruction in the following areas: nutritional assessment and interventions and therapies, including complementary and alternative nutrition therapies; macronutrients and micronutrients in health and disease, including metabolism, absorption, and utilization, as well as signs, symptoms, and management of deficiencies and excesses; nutrition through the life cycle; health promotion and disease prevention; and ethical issues in nutrition. This instruction may be in the form of lectures, conferences, seminars, or formal self-study programs or in other settings or locations, including previous or concomitant dietetic or graduate training in nutrition.

## CONCLUSIONS

IPNEC has made significant progress in its first 2 y of existence. With support from its participating societies and their representatives and with funding from the National Institutes of Health and several nutrition industry partners, a sustained, functioning consortium has been established. The consortium has formulated and refined a paradigm for PNSs, conducted a national role delineation survey to define the scope of the discipline of clinical nutrition, developed a preliminary curriculum template for training PNSs that may be completed in a minimum of 6 mo, and begun to disseminate information about the consortium's rationale and activities through national meetings and publications.

The members of IPNEC look forward to playing an important long-term role in nutrition education. In keeping with this, we

intend to continue soliciting broad input, especially from directors of fellowships in nutrition and closely related subspecialties; to develop a detailed curriculum guide for nutrition fellowships or fellowships in related subspecialties; and to initiate a unified PNS certification examination. If we build a strong PNS track, it will surely increase the likelihood that "they will come!" 

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