

Nutrition Care Process and Model: An Academic and Practice Odyssey



IN 2003, THE ACADEMY OF Nutrition and Dietetics, formerly the American Dietetic Association, adopted a Nutrition Care Process and Model (NCPM) that identifies the unique contribution of dietetics practitioners to health care outcomes and establishes a global standard for provision of nutrition care by dietetics practitioners (Figure 1).¹

This pivotal landmark enjoys a long odyssey. It honors the pre-1970s researchers, educators, and practitioners who built firm foundations for future change.² One of the early visions of an NCPM diagram emerged when Marian I. Hammond, MS, RD, a nutrition program faculty member in what is now the Department of Nutritional Sciences at The Pennsylvania State University (PSU), created a series of visual diagrams called the Hammond models. This series consisted of the 1970 original integrative Hammond model and the 1977, 1984, and 1986 iterations (Figures 2 through 5). At that time, dietetics educators faced teaching emerging nutritional counseling principles without a framework to organize the changing content of dietetics practice.

Independently, the Kellogg Continuing Professional Education Development Project Team embarked on a 5-year project (1980 to 1985) to develop new approaches to continuing education (CE) programming

for selected professions, including clinical dietetics.^{3,4} As part of its work, the Kellogg Continuing Professional Education Development Project Team reviewed the Hammond model and endorsed the 1986 iteration to represent its research results and to disseminate them through the Academy/Kellogg Continuing Professional Education Development Project Team collaboration.

Developmental work with the Hammond models ended in 1986 when Hammond left the teaching field and stored relevant documents. A succeeding PSU faculty member used the 1986 iteration in a nutrition counseling course.*

In 1998, the Academy appointed a Health Services Research Task Force charged with documenting the value of dietetics services' contribution to health care outcomes to further justify reimbursement for dietetics services/medical nutrition therapy. One of the main challenges facing the task force was how to identify the unique contribution of dietetics to overall health care outcomes (ie, What specific activities were consistently accomplished only by dietitians? What changes in health care outcomes could be reasonably attributed to those activities?).

This article reviews the steady evolution of the Hammond models and their impact on the current NCPM, compares key concepts of the Hammond models and NCPM iterations, describes their uses and benefits, and includes references used in their development. It provides an important historical perspective about the evolution of the NCPM and, consequently, presents information that will be helpful for developing future models/strategies to achieve best practices in nutrition care.

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MODEL DEVELOPMENT

Hammond Models (1970 to 1986)

Modern clinical dietetics practitioners integrate the sciences and humanities to promote healthy lifestyles by providing nutrition care in diverse settings. In the pre-1970s, most therapeutic dietitians provided direct care to inpatients in institutional settings under physicians' supervision.⁵⁻⁷ Ensuing changes in health care philosophies, delivery systems, and marketplace demands created new roles for dietitians. New audiences for nutrition care challenged existing academic curricula. The Academy updated its accreditation and credentialing standards and embraced the 4-year coordinated undergraduate program philosophy.⁸⁻¹⁰

In response to these changes, the PSU Department of Nutritional Sciences faculty integrated applied modules into its new undergraduate medical dietetics curriculum.¹¹ The diet therapy module was piloted in 1970. During course design, literature reviews and experience affirmed that traditional diet therapy instruction was mainly theory based. Practice directives were scattered across journal articles and nursing-specific textbooks. Diets reflected standardized protocols and were presented primarily as textual lists. Comprehensive diagrams depicting nutritional counseling principles were not found.¹²⁻¹⁴

Hammond utilized the academic freedom and opportunities at PSU to shift diet therapy instruction silos forward to integrate the behavioral science of dietetics with the biological science of dietetics. The need for a construct that visualized nutritional counseling/nutrition care planning components and their relationships became clear as Hammond worked to make integrated diet therapy meaningful to students.

The ensuing Hammond models turned nutritional counseling/nutrition care planning principles into holistic flow diagrams that portrayed the

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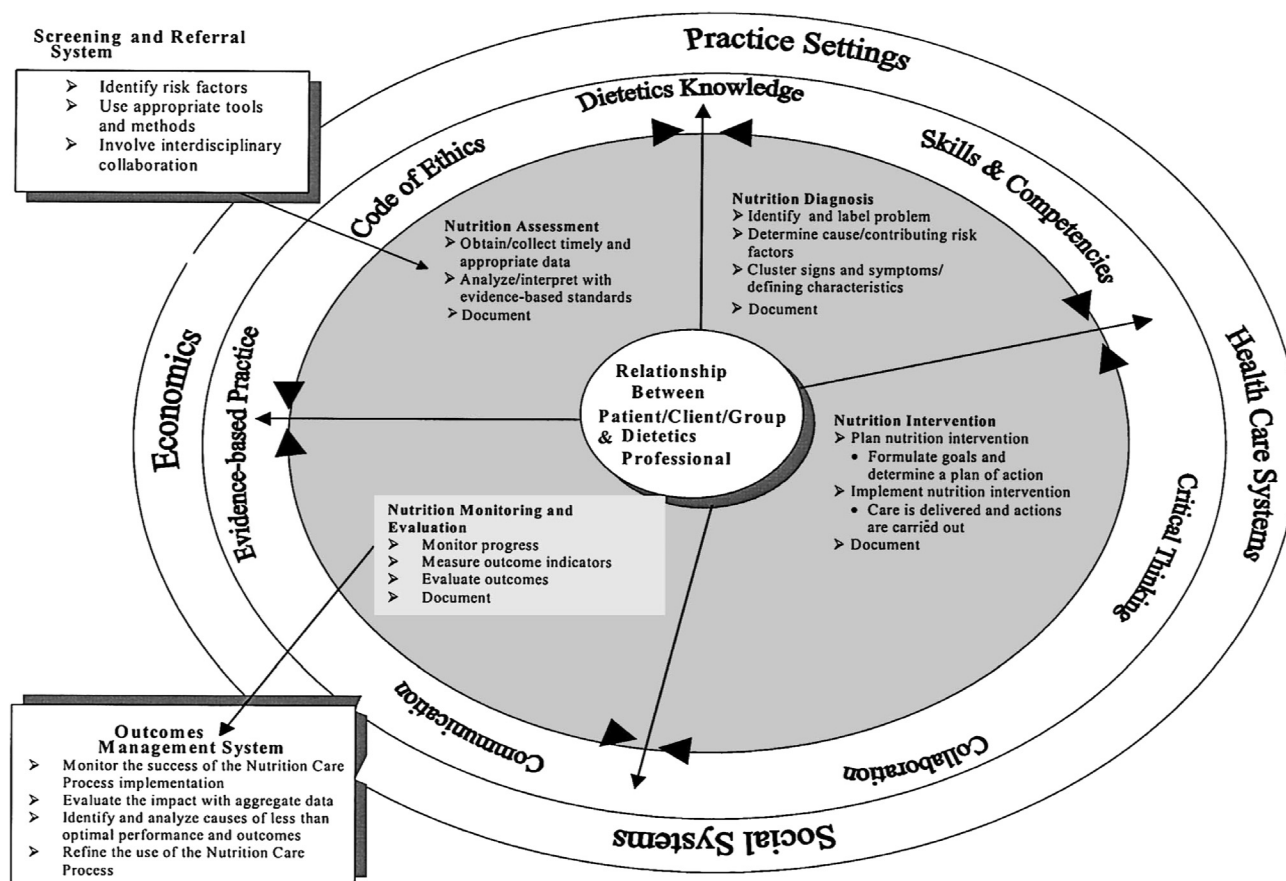


Figure 1. 2003 Academy Nutrition Care Process and Model. Reprinted from Lacey and Pritchett.¹

evolution of dietetics practice through four separate and consecutive time periods and for differing users. Iterations were continually reviewed and revised, but those presented here are the major benchmarks.

Numerous influences guided creation and evolution of the Hammond models. Among them were Hammond's philosophies shaped by personal background, coordinated undergraduate program development experience, PSU teaching experience, Academy Position Papers, literature from related fields (eg, psychology, sociology, and anthropology), and work by the Kellogg Continuing Professional Education Development Project Team.^{3,4}

Key Concepts and Rationale

Application of the Hammond models assumed current diet therapy theory competence at undergraduate student or practitioner levels. Figure 6 presents the development of the four Hammond models (from 1970 through 1986) and key concepts: purpose and goals, target

audiences, schema, language, title, and components (Entry, Core, Contact/Visit Cycle steps, and Outer Frames/Rings).

Purpose and Goals. The long-term purpose and goals of the Hammond models were to depict current nutritional counseling/nutrition care planning principles in one schematic and to develop analytical, reasoning, and discipline foundations for learning and practice updates for various target audiences.

Schema. The first schematic to represent the model's philosophy was a hand-drawn sketch that organized nutritional counseling concepts into a wheel-like shape (Figure 2). This shape portrayed nutritional counseling as a continual cyclic and dynamic flow within and among discrete but intertwining components. The patient/dietitian connection formed the wheel's hub, and steps in the contact/visit cycle formed its rim. Graphic design features (arrows) formed spokes that connected and supported the components. If/when any part of the structure or supports

was omitted or weakened, the process became compromised.

Ensuing iterations expanded key concept details and design features, but this original vision held true throughout (Figures 2 through 5).

Language and Title. Each model used the language of its time with words and phrases carefully chosen to describe concepts and produce teaching moments. Gradually, the literature began to refine confusing terminology, such as *dietary*, *nutrition*, *nutritional*, *counseling*, *teaching*, and *nutrition education* and provided synonyms, pairings, or various forms of the terminology. In addition, dietitians were initially called *therapeutic dietitians*, later *clinical dietitians*, and most recently *registered dietitian nutritionists*.^{6,10,15-18}

As practice evolved, language choices converted inert nouns into active problem-solving verbs (eg, *develop*, *assess*, and *plan*). Other terms (eg, *formulate*, *interpret*, *impressions*, and *monitor*) reflected the more autonomous roles dietitians were assuming.

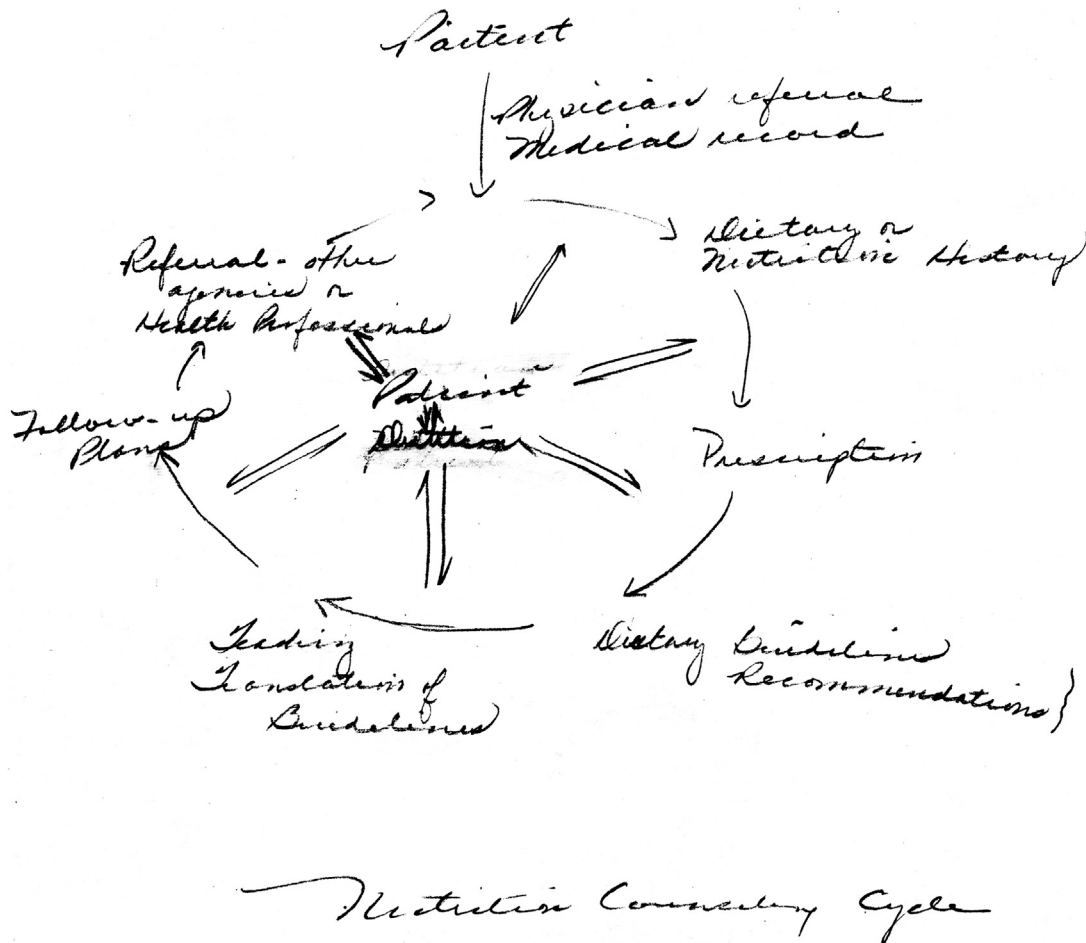


Figure 2. 1970 Original Hammond Model. This is a scan of the original hand-drawn pencil sketch. Readers can note the erasures in the patient–dietitian core. Hammond initially placed the dietitian first in the relationship, then, after realizing that the patient came first, changed the order.

Components and Flow. The Hammond models depicted nutrition care that flowed systematically through multiple components and cycles. The Entry component illustrated the path of initial patient/client–registered dietitian contact. Patients traditionally entered care from a hospital setting, but later came from various screening and referral sources. The Core component (Patient–Dietitian leading to The Helping Relationship leading to Partnership) cemented the patient/client–registered dietitian partnership as the nucleus for effective outcomes in nutrition care.^{19–22} It depicted the partnership moving forward together to incorporate diet principles and behavior change into the patient's lifestyle.

The Contact/Visit Cycle component encompassed six steps that translated universal problem-solving language into dietetics language (Figure 6). A

systematized process evolved over time comprising the following steps:

1. diet history leading to develop database;
2. prescription leading to assess/interpret;
3. recommendations leading to plan/formulate goals and strategies;
4. teaching leading to implement;
5. follow-up leading to monitor/evaluate; and
6. referral leading to communicate/document.

These steps were ordered in logical sequence and weighted equally. In order to maximize accuracy and efficiency, the partnership needed to complete each step before moving to the next.

The Outer Frames/Rings component recognized overarching opportunities and constraints that affected nutritional counseling/nutrition care

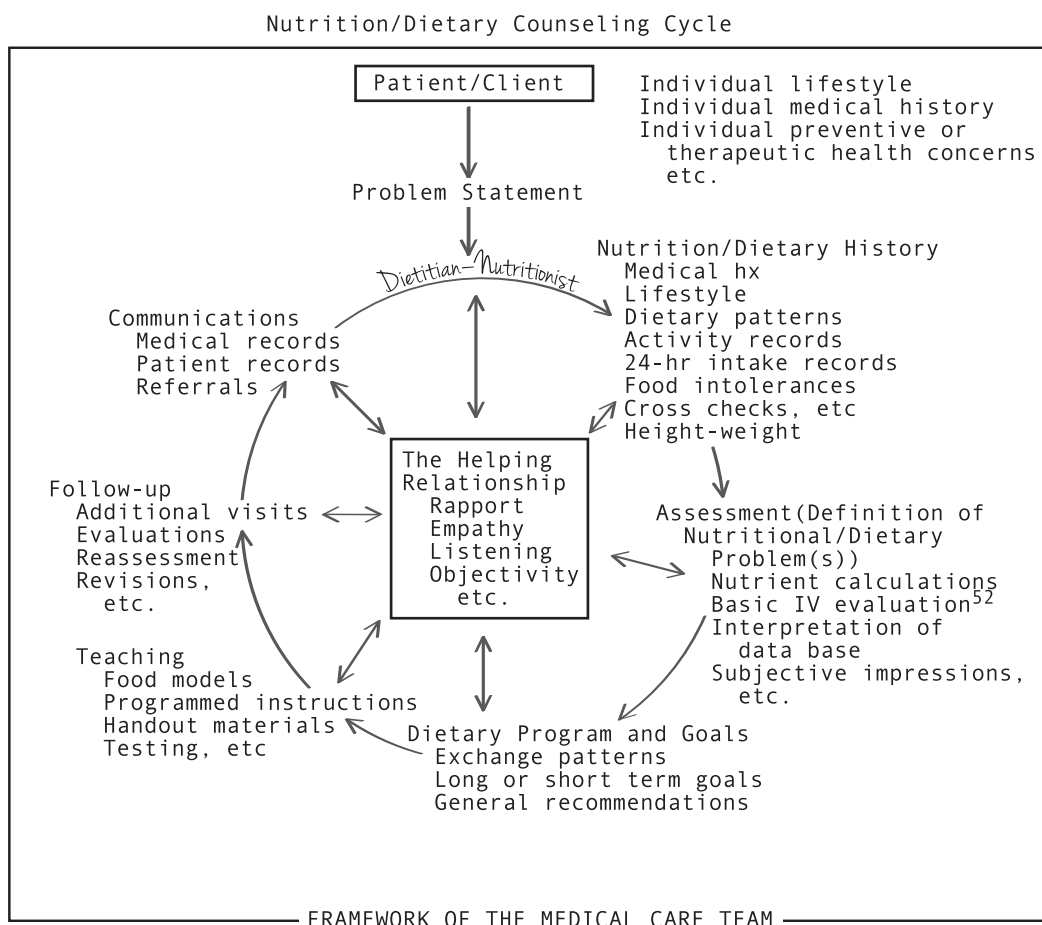
planning outcomes, practice decisions, and long-term professional goals: medical care team leading to health care team, counseling/helping relationship leading to counseling/style, and time.^{4–6,15,17,18,20,21,23}

Nutritional counseling/nutrition care planning continued until either desired goals had been achieved or one or both partners ended contact.[†]

Hammond Model Iterations and Rationale

This section highlights the most important features and rationale of each Hammond model as the series evolved (Figures 2 through 6). The first three Hammond models (1970, 1977, and 1984) demonstrated the most significant evolution. The last model (1986) included refinements

[†]A formal “exit” was not diagrammed into the Hammond model.



- To formulate and implement a Nutrition Care Plan:
1. Establish and maintain a helping relationship
 2. Obtain data base (nutrition/dietary history)
 3. Assess or interpret data
 4. Develop dietary program including short and long-term goals (Nutrition Care Plan)
 5. Implement. Teach the patient/client
 6. Design follow-up
 7. Communicate

- To chart:
1. Evidenced in charting notes
 2. Subjective and Objective
 3. Assessment
 4. Plan
 5. ?Assessment?
 6. Plan
 7. System called SOAP charting for the POMR (Problem Oriented Medical Record)

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Figure 3. 1977 Hammond Model.

(eg, graphic design presentation and selected language) but retained the basic model structure and components.

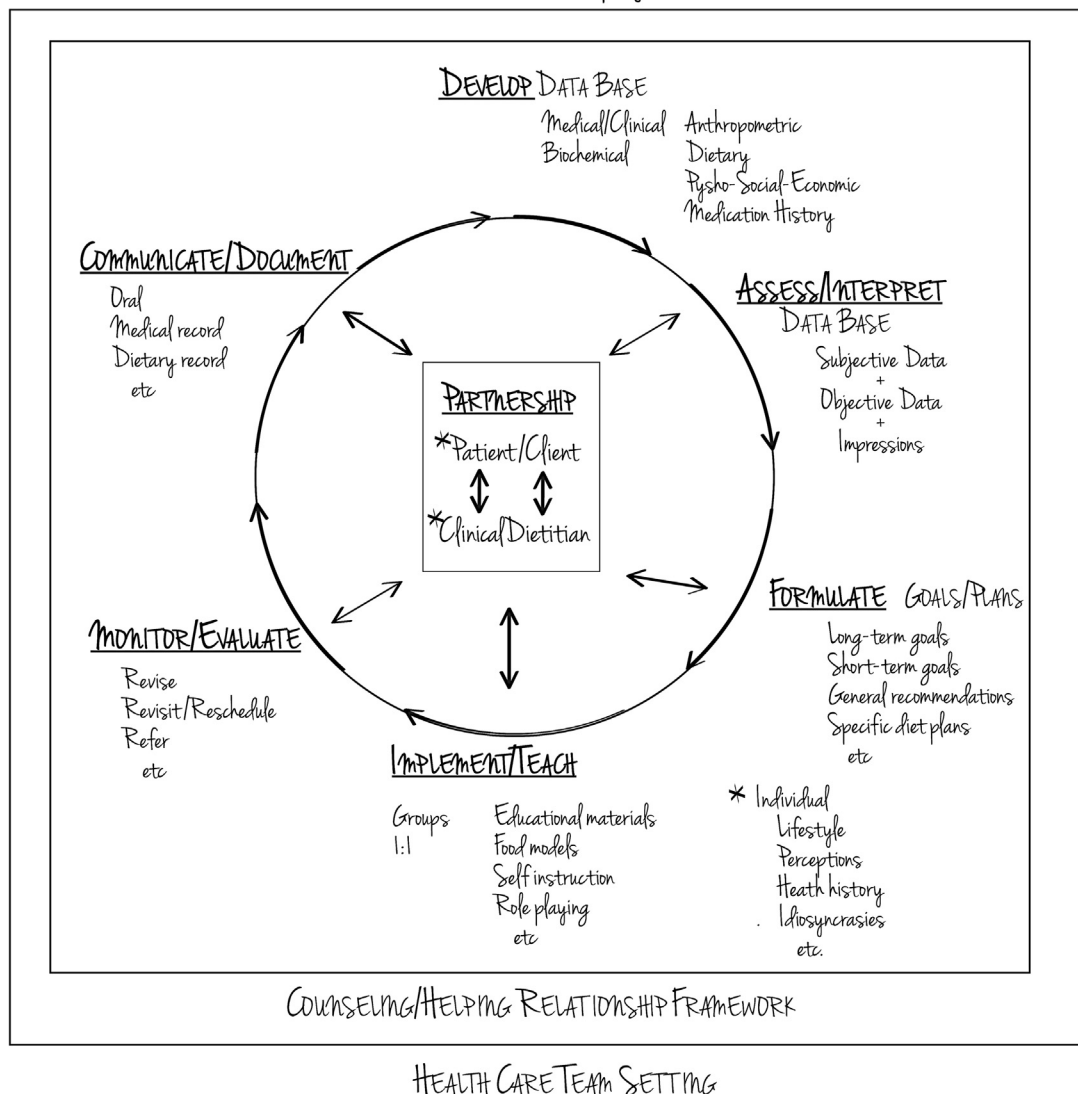
Nutrition Counseling Cycle (1970 to 1972). The initial Hammond model distilled the 1970s practice baselines and emerging trends into a “Nutrition Counseling Cycle” that depicted a dietitian practicing by fulfilling orders/prescriptions written by physicians but

beginning to transition into newer roles²⁴ (Figure 2). Inpatients entered nutrition care via written physician referrals.^{5,20,25} Dietitians established basic patient–dietitian communication, but typically disseminated information instead of counseling. The nutrition counseling literature acknowledged the importance and need for effective interviewing and behavior change from a conceptual standpoint; however,

strategies for teaching these skills to dietetics students and practitioners had not yet developed.^{15,19,20,22,26-31}

Dietitians used traditional dietary/nutrition history interviewing methods to gather, organize, and assess information from patient interviews, food records, significant others, and medical records. They translated physicians’ prescriptions (eg, diet for weight loss) into dietary prescriptions (eg,

The Nutritional Care Planning Cycle: A Generic Philosophy



Marian Hammond, 1984

Figure 4. 1984 Hammond Model.

1,800-kcal diet) and used the dietary history to plan dietary guidelines/recommendations (eg, 1,800-kcal meal plan using exchange lists or basic food-group servings). The literature encouraged dietitians to actively teach/translate guidelines (eg, teach patients to use a plan to make food choices). However, teaching opportunities, usually “discharge diets,” were singular events. Follow-up consisted of recommending available agencies, health professionals, or other community resources.^{15,20,21,25,27,28,32}

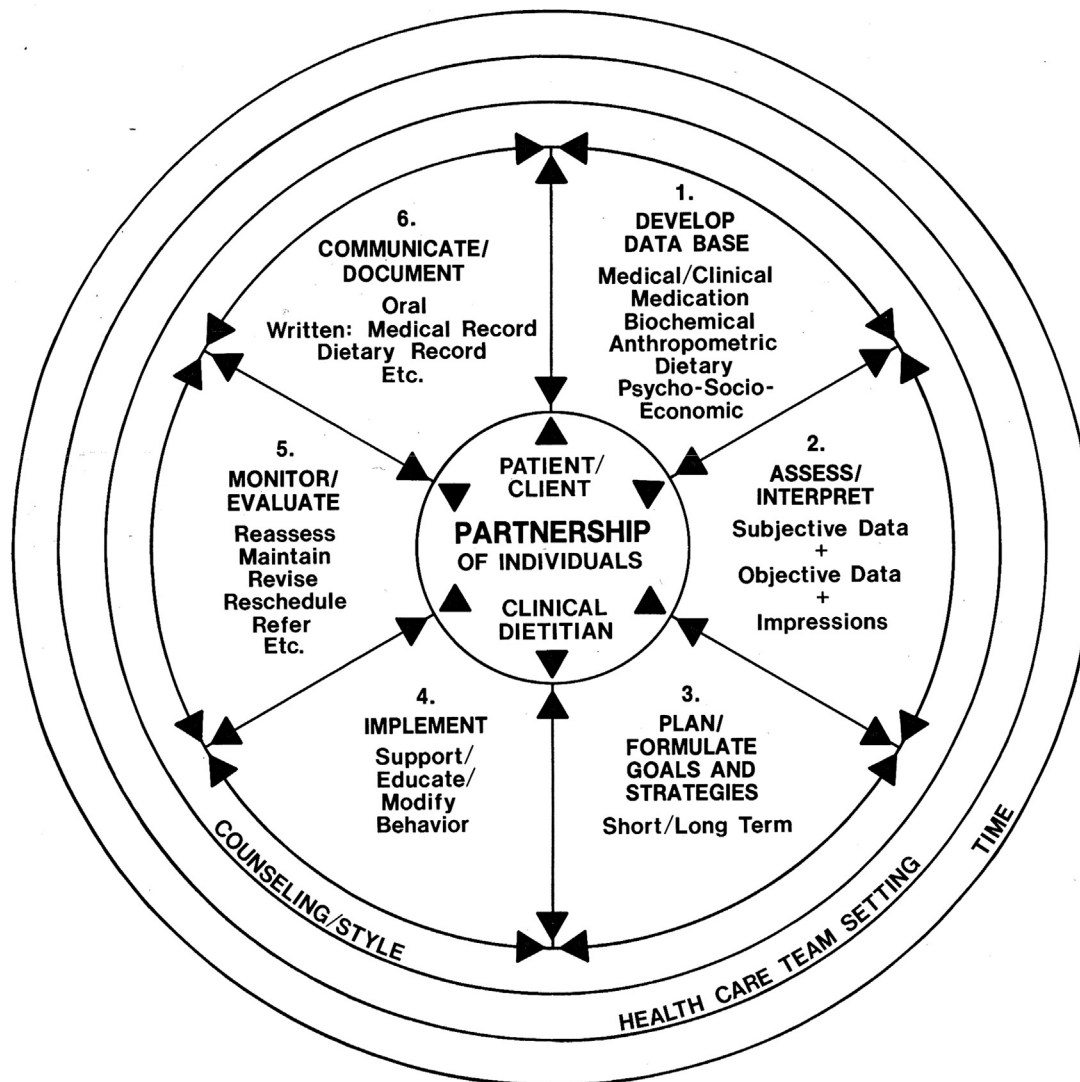
Dietitians routinely kept patient progress notes in dietary department files. The Academy and the American Hospital Association recommended medical record documentation, but charting strategies were just forming.³³

Nutrition/Dietary Counseling Cycle (1972-1977). The 1977 iteration (Figure 3) evolved in a clinic setting and generally reflected a dietitian who evaluated and counseled the self-referred patient/client as well as fulfilled the prescription ordered by a

referring physician.³⁴ This iteration formalized component headings and added the first outer frame. From the 1977 iteration forward, component headings included subheadings for teaching purposes and guided students learning to conduct hands-on counseling sessions.

The 1977 title “Nutrition/Dietary Counseling Cycle” straddled terminology confusion but gave preference to nutrition vs dietary terms. It was the first iteration to summarize steps required to develop nutrition care plans

THE NUTRITION CARE PROCESS: A GENERIC PHILOSOPHY



©M. Hammond, 1986

Figure 5. 1986 Hammond Model.

and SOAP (subjective, objective, assessment, and plan) medical record notes.

The physician's problem statement identified patients that required care and the patient/client entered directly into the core relationship. The core expanded into a more functional patient/client-registered dietitian connection through Danish's pioneering research at PSU entitled "The Helping Relationship," which provided early systematic teaching/training for applying effective relationship-building and goal-setting skills.^{30,35,36}

The 1977 iteration condensed step 1 to gathering and organizing dietary history information. The former assessment component moved to a new step 2, labeled "Assessment (Definition of Nutritional/Dietary Problem(s))."

A 1971 Academy Position Paper stated that clinical nutrition specialists should "accept responsibility for the diet prescription."¹⁰ PSU clinic practitioners and students began developing dietary diagnoses and prescriptions for selected nutrition problems in the early 1970s.³⁴ However, the emerging concept of the nutrition prescription

and its partner, nutritional diagnosis, was generating so much controversy that these overt labels were omitted from the model.

The patient/client-registered dietitian formed the assessment into a problem statement(s) and then into comprehensive and individually tailored nutrition, exercise, and behavior modification programs with short- and long-term goal strategies (step 3).

Placing students in outpatient nutrition clinics that provided long-term patient follow-up made teaching

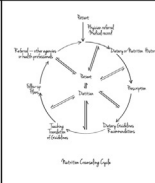

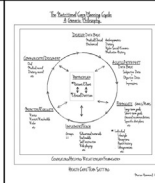

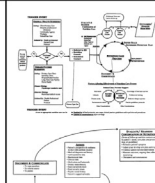

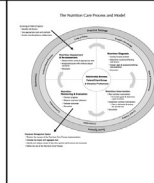
Key Concepts	Hammond Models				Academy of Nutrition and Dietetics (NCPM)		
Year	1970 (Original Hammond Model) 1970-1972	1977 (1972-1977)	1984 (1977-1984)	1986 (1984-1986)	2001 ⁴⁸	2003 ¹	2008 ⁴⁹
Models							
PURPOSE/GOALS	To depict nutrition counseling principles in one schematic and to provide a visual teaching tool	To depict nutrition counseling principles in one schematic and to provide a visual teaching tool	To depict nutrition counseling principles in one schematic and to provide a visual teaching tool	To provide a visual teaching tool and "Pocket Guide to Individualized, Comprehensive Nutrition Care"	Framework for standardized definitions of essential nutrition care processes and outcomes	Consistent and systematic structure and method for dietitians to demonstrate outcomes, Enhancement of the practice of dietetics and promote the dietitian	Provide framework for dietitians delivering nutrition care
TARGET AUDIENCES	Course: Diet Therapy Instructor Undergraduate students	Course: Introduction to Nutrition Counseling Instructor Undergraduate students Graduate assistant RDs	Courses: Diet Therapy and Introduction to Nutrition Counseling Instructor Undergraduate students Graduate assistant RDs	Kellogg Project/Academy Workshops Dietetic Practitioners	Nutrition care providers, outcome researchers, policy makers/insurers, other health care providers, medical record systems, administrative, health service, and payment/reimbursement data systems	Dietitians in practice, Academy committees and organizational units, educators, and students	Dietitians in practice, educators, students, accrediting agency, credentialing agency, and researchers
SCHEMA	Hand-drawn and hand-lettered sketch Continual circle Uni- and bi-directional arrows supporting connections and flow No external frame	Hand-drawn and typed graphic Continual circle Uni- and bi-directional arrows supporting connections and flow External frame: one four-sided figure	Hand-drawn and -lettered graphic Continual circle Uni- and bi-directional arrows supporting connections and flow External frames: two four-sided figures	Professionally drawn graphic Continual circle Bi-directional arrows supporting connections and flow Fonts of varying size and bolding External rings: three	Professionally drawn graphic; two separate graphics, one representing the model of care and one representing the actual care process; annotation at bottom indicating factors that enable or limit/constrain access to appropriate nutrition care	Professionally drawn graphic; continual circle, bi-directional process, core to process and environment arrows, arrows into and leaving process toward supporting systems; two outer rings, fonts of varying size	Professionally drawn graphic; continual circle, bi-directional process, core to process and environment arrows, arrows into and leaving process toward supporting systems; two outer rings, fonts of varying size
LANGUAGE	Language of the time	Language of the time (expanded and refined)	Language of the time (expanded and refined)	Language of the time (Refined and simplified)	Language of the time	Beginning to incorporate standardized language	Standardized language with defined terms
TITLE	NUTRITION COUNSELING CYCLE	NUTRITION/ DIETARY COUNSELING CYCLE	THE NUTRITION CARE PLANNING CYCLE: A GENERIC PHILOSOPHY	THE NUTRITION CARE PROCESS: A GENERIC PHILOSOPHY	NUTRITION CARE MODEL AND NUTRITION CARE PROCESS	NUTRITION CARE PROCESS AND MODEL	NUTRITION CARE PROCESS AND MODEL
ENTRY	Patient via physician referral and/or medical record into actual contact/visit cycle	Patient/client via physician's problem statement/ diet order Individual lifestyle Individual medical history Individual preventive or therapeutic health concerns etc.	Not specified. (Implied entry shifted to Core.)	Not specified. (Implied entry shifted to Core.)	Trigger event is general health or disease-focused screening leading to referral to RD, nutrition consultation, and scheduled contact with dietitian	Output from screening and referral system	Output from screening and referral system
CORE	Patient/dietitian Connected to each other and actual contact/visit steps via bi-directional arrows	"The Helping Relationship" Rapport Empathy Listening Objectivity Etc. Connected to actual contact/visit steps via double-headed arrows Framed by four-sided figure	Partnership *Patient/Client and *Clinical Dietitian [each having] *Individual Lifestyle, Perceptions, Health History Idiosyncrasies Etc. Connected to each other and actual contact/visit steps via double-headed arrows Framed by four-sided figure	Partnership of Individuals Patient/Client and Clinical Dietitian Connected to each other and actual process/visit steps via bidirectional arrows Framed by circular ring	Factors Affecting Effectiveness of Nutrition Care Process includes Patient/Client-Provider Rapport (Patient factors - Motivation, Lifestyle, Disease acuity, SES and Provider factors - Knowledge of food and nutrition, professional training, behavior change expertise, practice guidelines, protocols)	Relationship between patient/client/group and dietetics professional	Relationship between patient/client/group and dietetics professional

Figure 6. Comparison of Hammond models and Academy of Nutrition and Dietetics models reflecting dietetics practice. Each model (from 1970 through 2008) is shown and key concepts described: purpose/goal of model, target audience, schema, language, title, entry into the model, the core of the model, the steps involved in patient contact, the outer frames or rings reflecting the environment in which dietitians practice, and the supporting systems of the model. (continued on next page)

more efficient (steps 4 and 5). In addition, new tools were developing, including behavior-modification techniques, three-dimensional food models, and educational materials designed for PSU dining and exercise situations.^{17,29,37-39}

Step 6 developed into a formalized communication step that mandated communication to and from other medical care team/health care team members and specified where communication was recorded (ie, medical, dietary, and referral agency records).^{33,40} Organizing and

writing patient/client contact summaries forced students and practitioners to think logically, systematically, and efficiently. Documenting each patient/client contact was becoming vital for quality assurance, cost-containment policies, third-party reimbursement, legal







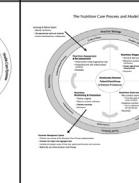
Key Concepts	Hammond Models				Academy of Nutrition and Dietetics (NCPM)		
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Models							
CONTACT/ VISIT CYCLE	6 steps: generic problem solving	6 steps: generic problem solving	6 steps: generic problem solving	6 steps: generic problem solving	5 steps: generic problem solving	4 steps: generic problem solving	4 steps: generic problem solving
Step 1	Dietary or Nutrition History	Nutrition/Dietary History Medical history Lifestyle Dietary patterns Activity records 24-hour intake records Food intolerances Cross-checks, etc. Height-weight	Develop Data Base Medical/clinical Biochemical Anthropometric Dietary Psycho-socio-economic Medication history	Develop Data Base Medical/clinical Medication history Biochemical Anthropometric Dietary Psycho-socio-economic	Assess (process step included a list of 11 common types of data to be assessed)	Nutrition Assessment - Obtain/collect timely and appropriate data - Analyze/interpret with evidence-based standards - Document	Nutrition Assessment & Re-assessment - Obtain/collect timely and appropriate data - Analyze/interpret with evidence-based standards - Document
Step 2	Prescription	Assessment (Definition of Nutritional/Dietary Problem(s)) Nutrient calculations Basic IV evaluation ⁵² Interpretation of data base Subjective impressions Etc.	Assess/Interpret Data Base Subjective data + Objective data + Impressions	Assess/Interpret Subjective data + Objective data + Impressions	Define Goals, Determine Nutrition Plan - Ensure Optimal Nutrition Care for patient - Evaluate assessment data to prioritize problems - Obtain patient's goal preferences - Consider protocol, care map or clinical practice guidelines and medical team "ideal" goals for patient - Establish goals and define strategies to reach goal(s) tailored to patient's view	Nutrition Diagnosis - Identify and label problem - Determine cause/ contributing risk factors - Cluster signs and symptoms/defining characteristics - Document	Nutrition Diagnosis - Identify and label problem - Determine cause/ contributing risk factors - Cluster signs and symptoms/defining characteristics - Document
Step 3	Dietary Guidelines/ Recommendations	Dietary Program and Goals Exchange patterns Long-term or short-term goals General recommendations	Formulate Goals/Plans Long-term goals Short-term goals General recommendations Specific diet plans, Etc.	Plan/Formulate Goals and Strategies Short/Long-term	Implement Intervention - Food and nutrient modification/behavior change - Team management - Referral to other health care/community service - Schedule next nutrition contact	Nutrition Intervention - Plan nutrition intervention (plan goals and determine a plan of action) - Implement nutrition intervention (care is delivered and actions are carried out) - Document	Nutrition Intervention - Plan nutrition intervention (plan goals and determine a plan of action) - Implement nutrition intervention (care is delivered and actions are carried out) - Document
Step 4	Teaching/Translation of Guidelines	Teaching Food models Programmed instruction Handout materials Testing	Implement/Teach (Groups and/or 1:1) Educational materials Food models Self-instruction Role playing Etc.	Implement Support/Educate/ Modify Behavior	Document & Communicate - To team members - To referral source - To payors	Nutrition Monitoring and Evaluation - Monitor progress - Measure outcome indicators - Evaluate outcomes - Document	Nutrition Monitoring and Evaluation - Monitor progress - Measure outcome indicators - Evaluate outcomes - Document
Step 5	Follow-up Plans	Follow-Up Additional visits Evaluations Reassessment Revisions Etc.	Monitor/Evaluate Revise Revisit/reschedule Refer Etc.	Monitor/Evaluate Reassess Maintain Revise; Revisit; Re-schedule Refer Etc.	Evaluate/Reassess Continuation of Nutrition Care (Series of follow-up nutrition contacts as indicated by patient's needs, care plan, and protocol, care map or guidelines) - Re-assess patient's progress - Adjust plan/ develop new plan and/or goals - Continue patient-tailored intervention - Measure outcomes, ongoing data collection - Monitoring - Document and Communicate	None	None
Step 6	Referral- Other agencies or health professionals	Communications Medical records Patient records Referrals	Communicate/Document Oral Medical records Dietary records Etc.	Communicate/Document Oral Written Medical Record Dietary Record Etc.	(Documentation included as earlier step)	(Documentation included in each step)	(Documentation included in each step)

Figure 6. (continued) Comparison of Hammond models and Academy of Nutrition and Dietetics models reflecting dietetics practice. Each model (from 1970 through 2008) is shown and key concepts described: purpose/goal of model, target audience, schema, language, title, entry into the model, the core of the model, the steps involved in patient contact, the outer frames or rings reflecting the environment in which dietitians practice, and the supporting systems of the model. (continued on next page)



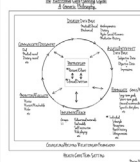

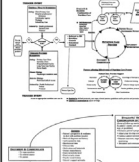

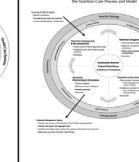
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Models							
OUTER FRAMES/RINGS	None	One four-sided frame	Two four-sided frames	Three circular rings	Access to appropriate nutrition care	Two rings and Two supporting systems (Screening and Referral and Outcomes Management Systems)	Two rings and two supporting systems (Screening and Referral and Outcomes Management Systems)
Frame 1	None	Framework of the Medical Care Team	Counseling/Helping Relationship Framework	Counseling/Style	Enabled by defined protocols, care maps, clinical practice guidelines and/or policies and procedures	Practice settings Healthcare systems Social systems Economics	Practice settings Healthcare systems Social systems Economics
Frame 2	None	None	Health Care Team Setting	Health Care Team Setting	Limited or constrained by payor coverage	Dietetics knowledge Skills & competencies Critical thinking Collaboration Communication Evidence-based practice Code of ethics	Dietetics knowledge Skills & competencies Critical thinking Collaboration Communication Evidence-based practice Code of ethics
Ring 3	None	None	None	Time	None	None	None
Supporting System 1	None	None	None	None	None	Screening and Referral System - Identify risk factors - Use appropriate tools and methods - Involve interdisciplinary collaboration	Screening and Referral System - Identify risk factors - Use appropriate tools and methods - Involve interdisciplinary collaboration
Supporting System 2	None	None	None	None	None	Outcomes Management System - Monitor the success of the Nutrition Care Process implementation - Evaluate the impact with aggregate data - Identify and analyze causes of less than optimal performance and outcomes - Refine the use of the Nutrition Care Process	Outcomes Management System - Monitor the success of the Nutrition Care Process implementation - Evaluate the impact with aggregate data - Identify and analyze causes of less than optimal performance and outcomes - Refine the use of the Nutrition Care Process

Figure 6. (continued) Comparison of Hammond models and Academy of Nutrition and Dietetics models reflecting dietetics practice. Each model (from 1970 through 2008) is shown and key concepts described: purpose/goal of model, target audience, schema, language, title, entry into the model, the core of the model, the steps involved in patient contact, the outer frames or rings reflecting the environment in which dietitians practice, and the supporting systems of the model.

issues, and marketing of clinical dietitians' contributions to health care.^{7,17}

An outer frame, "Framework of the Medical Care Team," anchored the patient/client-registered dietitian into the health care team setting and was the first attempt to depict the connection to the external environment in which dietitians practiced. Resources were urging practitioners to define, claim, and communicate their rightful contributions to comprehensive health care and commonalities with other health care team members. Most descriptions identified the clinical dietitian as a team consultant rather than a team member.^{5-7,18,23}

Nutritional Care Planning Cycle (1977-1984). During the next 7-year period, experience, the literature, and other resources developed significantly. Mason and colleagues published a benchmark systems- and process-oriented four-step guide to nutritional care.¹⁸ Hammond experimented with Mason's Systems Model and observed that although the text discussed broader practice issues, the model depicted one practice dimension: Process. In addition, the schematic's 90-degree angles, straight lines, and boxes imparted a less desirable flat and structured flow to nutrition care planning.

In 1982, the Academy published a Position Paper that labeled and delineated the clinical dietetics specialty role

and conceptually outlined the clinical dietitian's responsibilities.⁶ These advances reinforced the 1984 iteration that described the case-oriented professional.²⁴ This iteration's title broadened to "The Nutritional Care Planning Cycle" to represent comprehensive nutritional care programs. The subtitle characterized nutritional counseling/nutrition care planning as "A Generic Philosophy" because of the model's potential as a universal tool. This and later iterations removed "Entry" to make the model more widely applicable.

By 1984, patients had become full-fledged members of the health care enterprise and core language became "Partnership," indicating that each patient/client-registered dietitian was

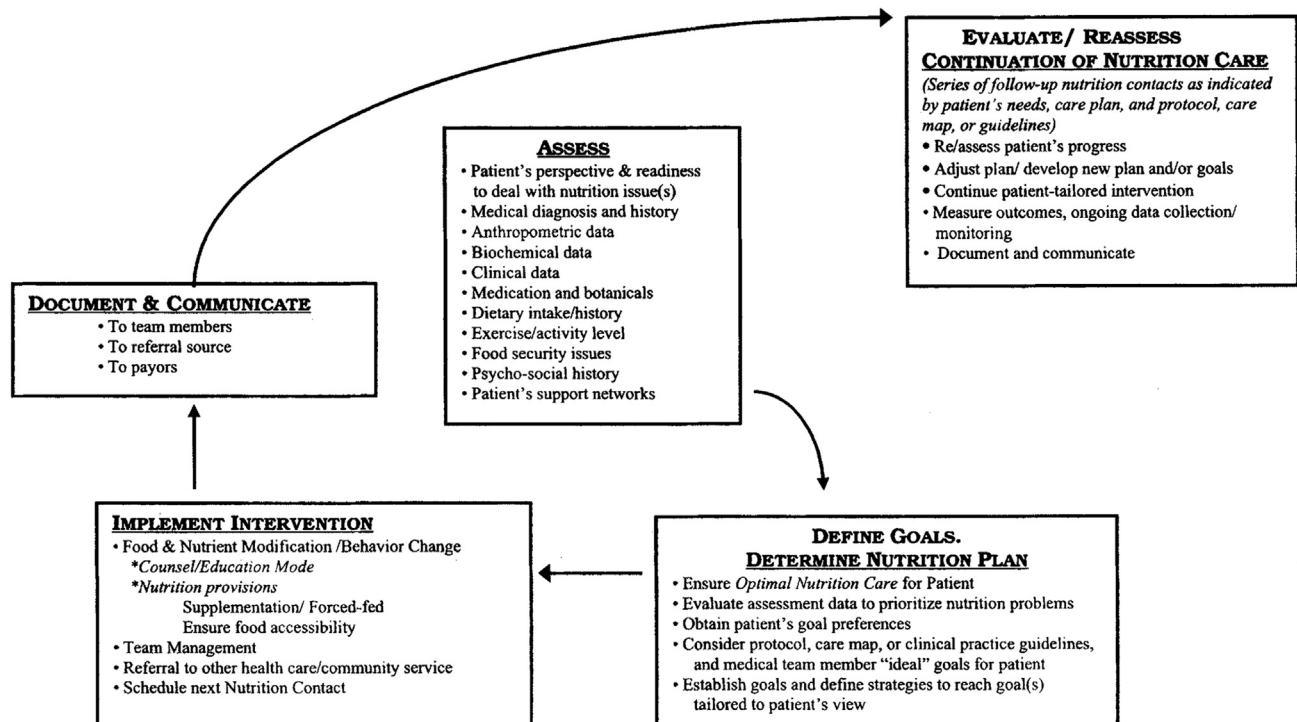
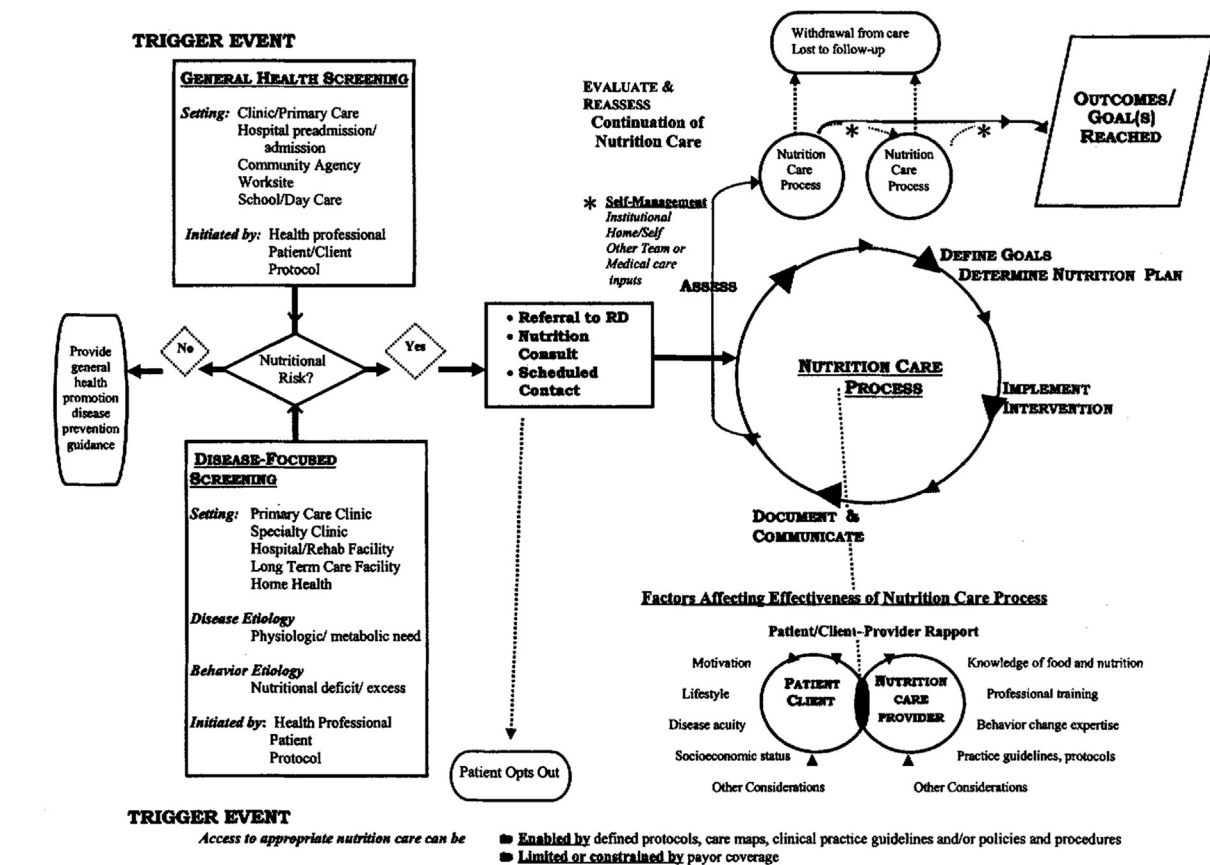


Figure 7. 2001 Academy Model of Nutrition Care Process. Reprinted from Splett and Myers.⁴⁸

The Nutrition Care Process and Model

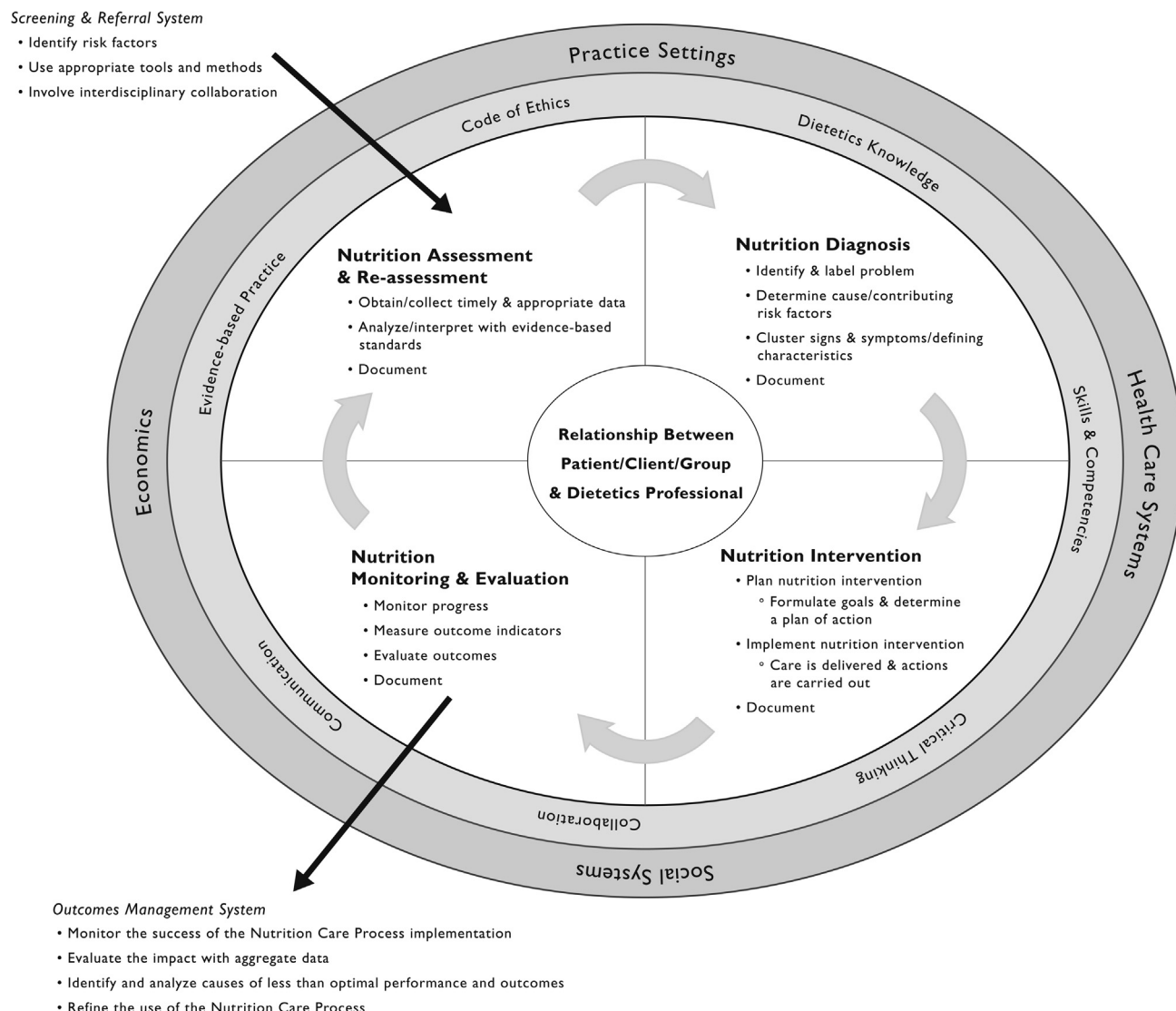


Figure 8. 2008 Academy Nutrition Care Process and Model. Reprinted from *International Dietetics and Nutrition Terminology Reference Manual: Standardized Language for the Nutrition Care Process*.⁴⁵

both a sender and a receiver. In addition, each member's individuality affected the partnership dynamics, process, and, most likely, quality of outcomes.^{17,19,30,37-39}

Through experience, core skills separated into two discrete but reinforcing groups. Basic helping skills, such as active listening and open-ended questioning, helped establish the partnership and were teachable in the PSU undergraduate curriculum. Advanced counseling skills moved to a new outer frame.

From 1984 onward, the first step in the contact/visit cycle became "Develop Data Base," a stronger directive and a nod to growing computer technology (Figure 4). The partnership was tasked with gathering data from six newly defined categories: medical/clinical, medication, biochemical, anthropometric, dietary, and psycho-socio-economic. Data sources expanded to include medical records and other health care team resources.^{6,17,18,41}

"Assessment" (step 2) organized data into three newly defined

categories: subjective (clarify and interpret patient interviews), objective (interpret data against reliable standards), and impressions (develop artfully from education, experience, and instincts). The impressions category was an early articulation of nutrition diagnosis. Step 5 changed to "Monitor/Evaluate," focused on outcomes, and began to incorporate practitioner effectiveness evaluations.^{17,18,38}

A new outer frame, "Counseling/Helping Relationship," reflected

Defined key concepts and systematized Nutrition Counseling/Nutrition Care Planning

- Integrated practice components (counseling, procedural, and environmental influences) into one focus
- Provided a consistent framework that enabled comprehensive and individualized solutions to case studies and practice issues
- Made teaching and learning more efficient because components were easy to picture, internalize, and recall
- Promoted quick cross-checks and targets for study and practice updates through a visual image
- Allowed patient-specific data to vary across patients/clients, health issues, and settings
- Encouraged flexibility and creativity by adapting to different student/practitioner skill levels, learning/practice styles, and practice environments
- Demonstrated commonalities among clinical dietitians and other health care professionals
- Showed potential for providing a common base for introductory applied nutrition courses with minor changes in language^a
- Showed potential for standardizing dietetics instruction across academia and practice across the dietetics profession
- Portrayed dietetics care as a stimulating integration of biological and behavioral science

^aThe Department of Nutritional Sciences, The Pennsylvania State University, introduced such a course (Nutrition Assessment) into its curriculum.

Figure 9. Benefits attributed to the Hammond models.

advanced counseling consistent with the literature and retained Danish's "Helping Relationship" identity.^{30,42} The former "Medical Care Team" frame was renamed "Health Care Team Setting" to acknowledge the growth of outpatient practices and ancillary health professions. It moved outward because the health care team encircled other concepts.¹⁸

By 1984, the Kellogg Continuing Professional Education Development Project Team assembled a forward-looking practice description for clinical dietetics that closely aligned with the 1984 Hammond model iteration. After study, it provisionally adopted the 1984 iteration to represent its research results.

The Nutrition Care Process: A Generic Philosophy (1986). The 1986 iteration portrayed state-of-the-art clinical dietetics practice and described the case-oriented clinical nutrition specialist²⁴ (Figure 5). Its aim was to introduce practitioners to new nutrition care protocols, applications, and CE opportunities.

This iteration incorporated refinements recommended by the Kellogg Continuing Professional Education Development Project Team. It became a professionally drawn graphic design. Components originally pictured as four-sided frames became circular rings to synchronize and emphasize practice dynamics. The Kellogg

Continuing Professional Education Development Project Team recommended changing the title to "Nutrition Care Process: A Generic Philosophy" to better represent the literature. Hammond saw nutrition care planning in a larger context in which process represented only one of the model components, but yielded to the group on the final diagram title. This iteration also refined selected component headings such as core, contact/visit cycle steps 3 and 4, and outer ring 2.

A new third outer ring, "Time," encircled all other components to address the challenges and opportunities of time on nutrition care planning, practitioners, and patients/clients. From the practitioner's perspective, time issues affected the nature and quality of most relationships, practice decisions, and professional development decisions. In addition, patients/clients lived and worked within health, cultural, motivational, and other personal circumstances that determined the time they could devote to making nutrition care planning visits and learning and implementing new behaviors.^{4,5,15,28,31,37}

After testing,[‡] a 1986 iteration workshop was presented at the 1986

[‡]"Caring for Individuals, Not Diseases: A Comprehensive Approach to the Nutrition Care of Persons with Diabetes," March 6-7, 1985 and June 10-11, 1986.

Academy 69th Annual Meeting[§] through the collaboration of the Academy and the Kellogg Continuing Professional Education Development Project Team. The model's schema was converted into a handout format entitled "The Clinical Dietitian's Pocket Guide to Individualized, Comprehensive Nutrition Care."

Academy NCPM (2001, 2003, and 2008)

The development process and specifics of the Academy NCPM are detailed elsewhere.^{1,43-47} Splett and Myers synthesized input from regional telephone focus groups into a diagram to describe the specific aspects of nutrition care that could logically lead to positive health outcomes⁴⁸ (Figure 7).

In 2002, the Academy appointed two committees that worked in parallel to explore development of a common nutrition care process for the dietetics profession and to elucidate concepts and terminology for nutrition diagnoses. The development process spanned almost 3 years, involved >150

[§]"Caring for Individuals, Not Diseases: A Comprehensive Approach to Nutritional Care Planning," co-presented by Marian I. Hammond, MS, RD, assistant professor, and Penny M. Kris-Etherton, PhD, RD, assistant professor, Nutrition Program, College of Human Development, The Pennsylvania State University, University Park.

Application area	Nutrition Care Process and Model uses and benefits
United States	
Accreditation	Serves as the framework for developing undergraduate accreditation standards, conducting registration examination, asking questions that guide evidence analysis projects, and organizing the Evidence-Based Nutrition Practice Guidelines.
Public policy	Aids in advocating for public policy stances in reimbursement, coverage, and informatics. ⁵¹
Health records	Serves as the framework for development of the Electronic Nutrition Care Process Record System, which, if adopted, will be the standard for future development of electronic health records systems that support work completed by registered dietitian nutritionists.
Standardized language and terminology	Aids in developing standardized language to reflect the activities that occur in each of the Nutrition Care Planning steps ⁵⁰ ; the IDNT has been promoted as a data element for research and for use in practice, particularly as the foundation for recording nutrition care in electronic health records.
Global	
Global input on NCPM	Aids in facilitating and incorporating global input. The Academy hosted several international input sessions in 2005 and 2010 and currently has formally incorporated international members in the NCP Standardized Language Committee to provide ongoing input to refinement of both the NCPM and terminology supporting the NCPM. The International Confederation of Dietetics Association and European Federation of Associations of Dietitians embraced the concept of having a common nutrition care process for the global dietetics community and appointed a committee to evaluate whether the NCPM requires modification to be a truly global model.
Global and multicultural outreach	Assesses global dietetic practices. Beginning in 2007, presentations and workshops were provided to multinational and multicultural audiences representing a variety of forms and complexity levels of dietetic practices in Sweden, Israel, Italy, Portugal, South Korea, Mexico, Norway, Japan, Malaysia, Australia, Brazil, and Canada.
Commitment to NCPM and IDNT	Facilitates commitment to NCPM and IDNT. For example, several associations (Canada, Australia, Japan, and Sweden) have formally adopted the NCPM and IDNT. South Korea, Mexico, Italy, Norway, France, Denmark, Taiwan, and the United Kingdom have signed translation licensure contracts with the Academy, strongly suggesting commitment to adopt NCPM and IDNT in their practice.

Figure 10. National and global applications of the Nutrition Care Process and Model (NCPM). The NCPM and the International Dietetics and Nutrition Terminology (IDNT) are used in various ways in the United States and other ways globally. The application areas in the first column indicate the broad areas of practice where the NCPM is used and the second column identifies the specific use and benefit attributed to using the model.

Academy members,¹ and included reviewing published literature, the Hammond model materials, seminal work completed by Mary Ann Kight, PhD, RD, and summarizing textbook approaches to describing dietetics practitioners' nutrition care in inpatient, outpatient, long-term care, and community settings. After significant committee deliberation, several different diagrams were provided to the Academy's House of Delegates for dialogue. After integrating the input, the resulting NCPM was strikingly similar to the Hammond model.

In addition, during the 2008 NCPM update, Hammond was invited to review the NCPM and provide input to the

Nutrition Care Process-Standardized Language Committee. After minor refinements were made, the NCPM was republished⁴⁹ (Figure 8).

MODEL USES

Educational Use of Hammond Models

From 1970 to 1986, the Hammond model holistic flow diagrams evolved with the growth of dietetics practice. They fulfilled their intended purposes and goals and yielded the additional benefits shown in Figure 9.

The mind and skill sets required to implement the practice components were complex and diverse. Students

were introduced to the model's organization and meanings of selected components and asked to apply the model to beginning case studies. Kellogg Continuing Professional Education Development Project Team workshops invited practitioners to self-assess their practices against the model's components and to plan their CE accordingly.

US and Global Applications of the Academy Models

The NCPM provides the Academy with tools to guide US education, standardized practice, and Academy strategic planning initiatives. It

advocates public policy stances and is framing an Electronic Nutrition Care Process Record System. Multinational and multicultural associations, groups, and local meetings spanning more than 12 countries and 3 continents provide ongoing input into NCPM refinement, dissemination, and adoption for their individual health care systems (Figure 10).^{50,51}

RESEARCH OPPORTUNITIES

Many of the research opportunities identified in the Hammond model years remain, such as formal evaluation of model efficacy, core relationship development, exploration of practitioner individuality and its effects on nutrition care planning outcomes, techniques for teaching model concepts, CE program development, and the impact of time. The NCPM provides an essential framework for exploring these issues.

The Academy's annual meeting has frequently included a specific category of research for abstracts and original contributions dedicated to research about the use and implementation of the NCPM and the International Dietetics and Nutrition Terminology. Authors who publish in the *Journal of the Academy of Nutrition and Dietetics* are encouraged to use the NCPM as a framework for articles describing nutrition care provided by dietetics practitioners.

SUMMARY

Models begin simply and continually evolve to reflect the current state of the art in a profession. When ideas or models are built on firm foundations, they stand the test of time. The Academy established a strong foundation for therapeutic practice beginning in the 1950s. The seminal work on the Hammond models, completed by the PSU faculty led by Hammond and in collaboration with the Kellogg Continuing Professional Education Development Project Team, was built on these foundations. Although the NCPM begins with the 1998 Health Services Research Task Force, it is clear from this article that the Academy's recent work was built on the foundation and concepts of previous work. The development process described here was also carefully synthesized from the seminal work of other dietitians (eg, Mary Ann

Kight, PhD, RD) and leaders from other disciplines (eg, Rogers, Mead, Maslow, and Danish).^{19,20,26,30} The Hammond model iterations show the importance of research, experimentation, and dialogue to inform the evolution of the models over time.

The richness of the content of the Hammond models reflects the best available research and published literature at the time and clearly sets the stage for the work accomplished by the Academy in the 2000s. Many of the same challenges identified in the Hammond model years remain, including use of a common language to describe care, development of the core partnership between the dietitian and patient/client, effective teaching and practice strategies, and the impact of time. This article illustrates the importance of gaining buy-in and input as models are developed. The Hammond models were developed and guided by one person. However, when the Academy began the work in the late 1990s, broad input was received from members throughout the profession through surveys, dialogue sessions in the House of Delegates, and input from other organizational units (ie, Accreditation Council for Education in Nutrition and Dietetics, the Commission on Dietetics Registration, and other committees). This led to broader understanding, support, and adoption of the NCPM, which is remarkably similar to the previous Hammond models. Although the original work on the Hammond models arose primarily from an educator's need to teach dietetics students more effectively, the current Academy model was developed to guide practice and policy as well. The NCPM continues to represent the highest standards and will guide dietetics educators and practitioners striving to continually improve their levels of teaching and practice. The odyssey described in this article illustrates the importance of understanding history and the present to inform future models and strategies.

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