

A New System of Documentation to Improve Dietitian – Physician Crosstalk

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ABSTRACT: **Background:** Standardization of the dietetic care process allows for early identification of malnutrition and metabolic disorders, interdisciplinary collaboration among the medical team, and improved quality of patient care. Globally, dietitians are adopting a nutrition care model that integrates national regulations with professional scope of practice. Currently, Israel lacks a standardized dietetic care process and documentation terminology.

Objectives: To assess the utilization of a novel sectoral documentation system for nutrition care in Israel.

Methods: Seventy dietitians working in 63 geriatric facilities completed an online training program presenting the proposed patient-sectoral-model. Training was followed by submission of sample case studies from clinical practice or completion of a case simulation. Application of the proposed model was assessed by measuring the frequency participants implemented different sections of the model and responses to an approval questionnaire.

Results: Fifty-four participants (77%) provided completed cases. Over 80% of participants reported each step of the proposed dietary care process with 100% reporting the “nutrition diagnosis”. Fifty-one dietitians (72.8%) completed the approval survey with the section on nutrition diagnosis receiving a highly favorable response (95%), indicating that the new documentation system was beneficial. Over 80% of participants rated the model useful in clinical practice.

Conclusions: A sectoral approach for documenting dietetic care may be the ideal model for dietitians working in specific patient populations with the potential for improving interdisciplinary collaboration in patient care.

IMAJ 2017; 19: 360–364

KEY WORDS: interdisciplinary patient care, geriatrics, long-term care facility (LTCF), nutrition care process (NCP), malnutrition

cialists, fosters collaboration among healthcare professionals, and optimizes patient care.

Each healthcare professional contributes a specialized perspective of the patient, and the EHR leverages these fractionated views into a coordinated system of organized patient information, which creates a continuum of appropriate care provided by all health disciplines. Furthermore, EHR can advance research by simultaneous analyses of thousands of medical cases to identify optimal treatment outcomes. To harness these capabilities, computerized medical records require a systematic, standardized terminology for documentation of patient care relevant to each professional practice, including physicians, dietitians, nurses, occupational therapists, physiotherapists, and speech pathologists [1].

In 2001 pioneering members of the Academy of Nutrition and Dietetics (formerly known as the American Dietetic Association) developed a guide for nutritional terminology tied to nutrition and dietetic practice entitled *Nutrition Care Process* (NCP) [2]. Standardized terminology provides an appropriate and consistent care experience for patients who need medical nutrition therapy [1,3], improves interdisciplinary healthcare, allows identification of those who need nutritional intervention and distinguishes dietetics practice from other specialists involved with patient care [1,3,4]. The movement to standardize nutrition care has spread to other countries including Canada, England, Korea, Australia [5], and Sweden [6]. Most of these systems are adaptations of the NCP (now called the *International Dietetic and Nutrition Terminology*) developed by the Academy of Nutrition and Dietetics [7,8].

Currently Israel has not adopted a systematic nutrition care process nor a consistent documentation terminology despite the widespread use of EHRs. The *International Dietetic and Nutrition Terminology* is difficult to use in Israel because the system uses a single set of terminology applied across all patient populations. In Israel, dietitians generally practice in specific patient populations and reach a high level of specialization. Consequently, a novel patient sectoral approach for documenting the dietetic care process was proposed [9] based on Israeli regulations of nutrition care [10], with the geriatric population being the first sector targeted for implementation [9]. Geriatric

At the end of the 20th century electronic health records (EHRs) were introduced in healthcare systems around the world. This technical breakthrough enables instant sharing of patient information among multiple facilities and spe-

practice was chosen to pilot this new system because one-third of patients in developed countries are malnourished in varying degrees upon hospital admission and most of these patients are elderly [11]. Older patients experience more medical complications exacerbated by reduced immune function and inadequate oral intake [12]. The connection between malnutrition and medical complications, including death, among residents in long-term care facilities (LTCF) is well documented [13-15]. Increased awareness of malnutrition and co-morbid conditions in elderly patients has led to the development of new criteria for diagnosis and treatment in the United States and Europe [16,17]. These new criteria require collaboration among many disciplines, including physicians, nurses, dietitians, occupational therapists and pharmacists [11]. Numerous studies have shown that coordination of patient care in geriatric populations at risk for malnutrition substantially reduces medical complications and cost, length of stay, risk of readmission and even mortality [11].

Patient-centered care requires that providers document their work with high clinical specificity. Physicians complete their documentation with the aid of well-defined medical diagnoses on which they base their treatment. Part of developing the nutrition care process for dietitians includes implementing this concept as the nutrition diagnosis is distinct from medical classifications. For example, a patient with a medical diagnosis of type 2 diabetes might have a nutritional diagnosis defining a nutritional problem as excessive carbohydrate intake. However, dietitians often have difficulty using the current nutrition diagnoses based on the American system because it uses generic terms to be applied across all patient populations.

A patient sectoral dietetic care practice (DCP) might be a viable alternative to the generic documentation system. We propose that nutrition diagnoses of geriatric-related terminology fosters interdisciplinary professional collaboration to identify and address geriatric malnutrition as well as other related nutritional conditions. We developed such a system and trained Israeli dietitians working in geriatric populations regarding its use [18]. The purpose of this study was to assess the implementation of our proposed model 3 months after the training.

PATIENTS AND METHODS

Certificated dietitians with at least a bachelor's degree and a minimum of 6 months of work experience in 63 geriatric LTCF agreed to participate. This number represents half of all LTCF, which are under the supervision of the Israeli Ministry of Health (Personal Communication, September 2016).

Seventy dietitians completed the 8-week online asynchronous course to learn the proposed sectoral dietetic care model. Training outcomes were previously reported [18]. Three months after completing the course, participants pro-

vided one case example of their work using the proposed documenting system [Figure 1]. Participants could provide a report of a new admission or a readmission. Those who did not want to provide an actual case from clinical practice could choose to complete one of two sample case studies developed from actual geriatric cases. At the conclusion of the educational program, participants were provided with a six-item opinion survey based on similar studies of online nutrition care process training [19,20]. Dietitians could also provide comments in a text area. The data was collected electronically or by telephone survey. Descriptive statistical analysis was performed using SPSS software version 22 (IBM Corp, Armonk, New York, USA). The research project was approved by the institutional ethical review board at the Hebrew University of Jerusalem.

RESULTS

Of the 70 dietitians who completed the online training, 54 (77%) submitted cases. Of those, 27 (50%) were reports of new admissions. Sixteen cases (30%) were readmissions, which afforded the opportunity to explore use of reassessment and evaluation of primary dietetic care. Eleven dietitians (20%) completed one of two case studies provided by the researchers.

Participants most frequently reported the first step of the DCP model, which is nutritional assessment and includes nutrition-related medical history (47, 87%), nutrition related clinical function (44, 81.5%), anthropometric measurements (45, 83%), and behavioral assessment and function (46, 85%). In the feeding route category, most dietitians reported their patients were fed orally (43, 79.6%).

Nutritional diagnosis in step two of the DCP model was also reported by the vast majority of participants (45, 83%). In this study 100% of the participants using case studies reported the nutritional diagnosis. Furthermore, nine of eleven case study reports (82%) had identical detailed diagnosis statements.

In the third part of the proposed DCP model, treatment goals were reported by 44 (82%) of the participants, and 37 dietitians (69%) recommended referral, which was a new component within the research tool for DCP. Least often, participants reported enteral feeding (7, 13.0%) and parenteral feeding routes (2, 3.7%) as part of the first step of the model and nutritional assessment. Participants did not consistently report percent of actual meal consumption by macro- and micro-nutrients including carbohydrates (15, 28%), fats (15, 28%) and minerals (16, 29.6%).

Of the 70 participants who completed the educational program, 51 (72.8%) completed an approval questionnaire regarding the proposed model in their clinical practice. Overall, more than 80% of the dietitians rated the model satisfactory and nutrition diagnosis earned the highest rated item in the model (95% agree or strongly agree).

Figure 1. Medical nutrition assessment and treatment report table

Nutritional consumption via document/report/observation	Nutritional supplements	Feeding route	Behavioral assessment	Physiological assessment		
Energy (kcal)	Nutritional supplements (g/ml as applicable)	PO: Texture Diet restriction Other	Nutritional habits	Nutrition-related medical history		
Carbohydrates (g)				Nutritional-related clinical function Swallowing Dentition Bite Digestion		
Protein (g)				Enteral-feeding (mL) <input type="checkbox"/> Peg <input type="checkbox"/> NG <input type="checkbox"/> Jejunostomy <input type="checkbox"/> Other <input type="checkbox"/> Type of Formula Details (as needed)	Function <input type="checkbox"/> Mobility <input type="checkbox"/> Ability to feed self <input type="checkbox"/> Environment	Anthropometric measurements Height, measured (cm) _____ Height, reported (cm) _____ Knee-height/ULNA (cm) _____ Calculated Height (cm) _____ Weight (kg) _____ Weight change (kg) _____ Edema (Yes / No) _____ BMI (kg/m ²) _____ Energy needs (kcal) _____ Protein needs (g) _____
Fat (g)				Nutritional additives (vitamins, minerals, probiotics, amino-acids, co-enzyme Q10, omega 3, herbals) (IU; g/d; mg/d)	Parenteral-feeding <input type="checkbox"/> TPN <input type="checkbox"/> PPN (L;ml/h;ml) <input type="checkbox"/> Formula (ml) Details	Cultural/Diet restrictions <input type="checkbox"/> Kosher <input type="checkbox"/> Vegetarian <input type="checkbox"/> Vegan <input type="checkbox"/> Other
Fiber (g)						
Alcohol (ml/UK)						
Liquids (ml)						
Liquids IV (L;ml/h;ml;U)						
Food – Drug interaction						

Actual consumption / Needs (%)	Body weight (by BMI Kg/m ²)
Energy (%)	BMI = 23–29.9 Standard (kg/m ²)
Carbohydrates (%)	BMI = 30 or 30+ Overweight (kg/m ²)
Protein (%)	
Fat (%)	BMI < 23 Underweight (kg/m ²)
Vitamins (%)	
Minerals (%)	Weight change: Last month / last 6 months (kg)
Liquids (%)	

Referral	Instructions	Nutritional prescription	Feeding route
Need referral: Y / N If yes, to: <input type="checkbox"/> Nurse <input type="checkbox"/> Physician <input type="checkbox"/> Dentist <input type="checkbox"/> Speech pathologist <input type="checkbox"/> Other	Details	Details	Oral Texture Type of menu Liquids (ml) Enteral feeding Formula (ml) Additions (details) Parenteral feeding (L;ml/h;ml) <input type="checkbox"/> TPN <input type="checkbox"/> PPN

DISCUSSION

To the best of our knowledge this Israeli research is the first to present the patient-sectoral approach to DCP/NCP documentation. The American one-size-fits-all generic approach has been adapted several times since its introduction. However, it remains problematic for use in clinical practice [1,19-21]. Although the International Dietetic and Nutrition Terminology (IDNT) has been mandatory since 2010, surveys show only half of U.S. dietitians use it in clinical practice [22]. Other countries attempting to use the American terminology have reported similar difficulties [23,24]. International documentation systems for the NCP (including the U.S. system) are based on a single set of nutritional diagnostic codes to be applied across all patient populations. Single set coding systems are large and cumbersome as they attempt to include every possible nutrition problem, making it difficult for use in clinical practice.

For more than 10 years dietitians from the United States have demonstrated difficulty in writing nutritional diagnosis statements [20,21,25]. Some have suggested limiting the

number of nutrition diagnoses to make the IDNT easier to use [25]. However, the results of our study suggest that the patient-sector model might be an optimal approach. Medical care is based on a patient’s primary medical condition (i.e., cardiac, renal, trauma, oncology). Perhaps nutrition diagnoses relevant to specific patient populations is a more logical approach instead of contriving a generic nutrition care documentation system to fit all patients. This study demonstrates that dietitians with no prior experience with a DCP system but trained in a patient-sector approach had little difficulty with nutrition diagnosis statements for new or returning patients. Assigning the correct diagnosis statement to support a nutrition diagnosis is problematic with the generic terminology system. In this study 82% of the dietitians identified a nutrition diagnosis, and in the case studies, all but one participant assigned the correct detailed statement to the appropriate diagnosis. Due to confidentiality regulations, researchers in this study could not examine the content of the diagnoses reported by participants using actual medical files of patients. However, the fact that all the dietitians embraced this new step of the DCP model may

be due to the specific patient-sector approach and associated documentation tool.

Another rationale for using a sectoral approach in dietetic care is that it fosters collaboration among healthcare professionals. Results from the training study indicated dietitians had difficulty with the inter-collaboration portion of the course [18]. The current study, which was conducted 3 months after the training, revealed dietitians documented referrals to other healthcare professional in 69% of cases and more than 80% rated use of referral on the documentation form highly favorable. Given the importance of inter-collaboration to address malnutrition in geriatric populations, the proposed patient sector specific DCP model is exemplary.

The least reported categories of the proposed model were subgroups related to geriatric nutritional assessment. Nutritional support using enteral (3%) or parenteral nutrition (7%) was least reported. However, oral feeding was the predominant route for 80% of the actual cases submitted (79.6%). In addition, the percentage of actual oral food intake and percent consumption vs. recommended consumption (including selected macro- and micro-nutrients) were not frequently reported. This finding may reflect the fact that these components are not currently required by the Israeli Ministry of Health.

Given the importance of monitoring adequacy and changes in oral intake for determining nutritional status of a patient, improvements in the training modules and reporting system are needed to address these areas.

A major limitation of this study was the fact that dietitians were not able to generate their case studies using their current workplace reporting systems because their electronic systems could not be modified. Participants had to manually add these sections (taking care to remove personal health identifiers) to the case reports they submitted or opt to use the case simulations. Another limitation of this study was selection bias. Dietitians were asked to provide only one example of dietetic care use and they could choose any case. Perhaps dietitians selected less complicated cases or those that could be easily completed. Sixteen dietitians (23%) who completed the training did not participate. Non-participants may have had time restrictions, work related constraints, or resistance to change, similar to results reported in the literature [19,21,25].

A major strength of this study is that over half of the dietitians working in geriatric clinical practice across Israel were represented. In addition, the high response rate (77%) following a training period that occurred 3 months earlier suggests high interest in the proposed model. The patient sectoral DCP presents a novel approach for overcoming major problems inherent with the IDNT-based systems, such as difficulty with nutrition diagnosis and related detailed statements. Other than the online training course, dietitians had no prior experience or requirement to provide a nutrition diagnosis in clinical prac-

tice. However, 3 months after training, every submitted case included the diagnosis and supporting detailed statements despite the fact that current EHR systems do not include this section. This result is in stark contrast to other studies assessing use of the American IDNT system. The second encouraging finding is the improvement in patient referrals to other healthcare specialties. The training portion of this research revealed that dietitians struggle with this area of practice [18]. However, 3 months post training, 79% of cases submitted by these dietitians included referrals to other healthcare professionals suggesting this might improve inter-collaboration.

CONCLUSIONS AND FUTURE IMPLICATIONS

Based on the favorable results of this study, the authors suggest that a patient-sectoral DCP and documentation system is ideal for dietitians to use in clinical practice. Follow-up research studies are recommended to assess the impact of a system-wide change in dietetic care documentation and clinical practice including evaluating collaboration with other healthcare professionals and patient outcomes. It is quite possible that other patient-sector systems (e.g., trauma, oncology, pediatrics) can be developed and implemented in Israel or other countries where dietitians work in specific patient populations, and that these systems might be beneficial to patient care.

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Acknowledgments

The authors thank Dr. Z. Stahl, H. Altman, A. Lang, and S. Shmilovitz for their professional contribution to the advisory committee and to the entire project.

References

1. American Dietetic Association. Nutrition care process part I: using the international dietetic and nutrition terminology to document the nutrition care process. *J Am Diet Assoc* 2008; 108: 1113-8.
2. Lacey K, Pritchett E. Nutrition care process and model: ADA adopts roadmap to quality care and outcomes management. *J Am Diet Assoc* 2003; 103: 1061-72.
3. American Dietetic Association. Nutrition care process part II: using the international dietetics and nutrition terminology to document the nutrition care process. *J Am Diet Assoc* 2008; 108: 1287-93.
4. Charney P. The nutrition care process and the nutrition support dietitian. *Support line* 2007; 29: 18-23.
5. Connor SL. Solving our patients' nutrition problems. *J Acad Nutr Diet* 2014; 114: 1872-3.
6. EFAD. European Federation of the Associations Dietitians, Professional Practice Committee (PPC): Vision Paper 2020: The implementation of the Nutrition Care Process (NCP) and Standardized Language (SL) among dietitians in Europe 2014. *The official website of the European Federation of the Associations Dietitians, EFAD* 2014; <http://www.efad.org>. (Accessed 11/2016)
7. Hakel-Smith N, Lewis NM. A standardized nutrition care process and language are essential components of a conceptual model to guide and document nutrition care and patient outcomes. *J Am Diet Assoc* 2004; 104: 1878-84.
8. Academy of Nutrition and Dietetics. Nutrition Care Process. EatRightPro official

- Website of the Academy of Nutrition and Dietetics 2015; <http://www.eatrightpro.org>. (Accessed 11/2016)
9. Rachman-Elbaum S, Porat-Katz BS, Kachal J, et al. Documentation of the dietetic care process: developing a sectoral, tailored system. *Eur J Clin Nutr* 2016; 70 (6): 753-5.
 10. Israeli Ministry of Health. Dietetic scope of practice for geriatric care. *Official Israeli Ministry of Health Website* 2012; <http://www.health.gov.il>. (Accessed 11/2016)
 11. Tappenden KA, Quatrara B, Parkhurst ML, Malone AM, Fanjiang G, Ziegler TR. Critical role of nutrition in improving quality of care: an interdisciplinary call to action to address adult hospital malnutrition. *J Acad Nutr Diet* 2013; 113: 1219-37.
 12. van Asselt, van der Cammen TJ, Disselhorst LG, et al. Assessment and treatment of malnutrition in Dutch geriatric practice: consensus through a modified Delphi study. *Age Aging* 2012; 41: 399-404.
 13. Silva A, Bruce S, De Groot L, Andrieu S, Abellan G, Vellas B, and the Task Force on Nutrition and Aging of the IAGG and the International Academy on Nutrition and Aging (IANA). Nutritional assessment of residents in long-term care facilities (LTCFS): recommendations of the task force on nutrition and ageing of the IAGG European region and the IANA. *J Nutr Health Aging* 2009; 13 (6): 475-83.
 14. Kagansky N, Berner Y, Koren-Morag N, Perelman L, Knobler H, Levy S. Poor nutritional habits are predictors of poor outcome in very old hospitalized patients. *Am J Clin Nutr* 2005; 82 (4): 784-791.
 15. Feldblum I, German L, Bilenko N, et al. Nutritional risk and healthcare use before and after an acute hospitalization among the elderly. *Nutrition* 2009; 25 (4): 415-20.
 16. Malone A, Hamilton C. The Academy of Nutrition and Dietetics/The American Society for Parenteral and Enteral Nutrition consensus malnutrition characteristics: applications in practice. *Nutr Clin Pract* 2013; 28 (6): 639-50.
 17. Cederholm T, Bosaeus I, Barazzoni R et al. ESPEN endorsed recommendation: Diagnostic criteria for malnutrition—An ESPEN Consensus Statement. *Clin Nutr* 2015; 34: 335-40.
 18. Rachman-Elbaum S, Stark AH, Kachal J, et al. Online training introduces a novel approach to documentation of the dietetic care process. *Nutr Diet* 2017; 1: 1-7.
 19. Zelig R, Byham-Gray L, Touger-Decker R, et al. Impact for continuing education. Applying the nutrition care process and model and the international dietetics and nutrition terminology for dietitians in long-term care. *Top Clin Nutr* 2011; 26: 268-80.
 20. Gardner-Cardani J, Yonkoski D, Kerestes J. Nutrition care process implementation: A change management perspective. *J Am Diet Assoc* 2007; 107: 1429-34.
 21. Hackel-Smith N, Lewis NM, Eskridge KM. Orientation to nutrition care process standards improves nutrition care documentation by the nutrition practitioners. *J Am Diet Assoc* 2005; 105: 1582-9.
 22. Ayres EJ, Hoggie LB. 2011 Nutrition informatics member survey. *J Acad Nutr Diet* 2012; 112: 360-7.
 23. Lövestam E, Orrevall Y, Koochek A, et al. Evaluation of Nutrition Care Process documentation in electronic patient records: need of improvement. *Nutr Diet* 2015; 72: 74-80.
 24. Vivanti A, Ferguson M, Porter J, O'Sullivan T, Hulcombe J. Increased familiarity, knowledge and confidence with Nutrition Care Process Terminology following implementation across a statewide health-care system. *Nutr Diet* 2015; 72: 222-31.
 25. Enrione EB, Reed D, Myers EF. Limited Agreement on Etiologies and Signs/Symptoms among Registered Dietitian Nutritionists in Clinical Practice. *J Acad Nutr Diet* 2016; 116: 1178-86.

Capsule

Mapping a path to HIV elimination

About 25 million people in sub-Saharan Africa are living with human immunodeficiency virus (HIV). Coburn et al. looked into the design of HIV elimination strategies. They focused on Lesotho, where approximately 25% of the population is infected with HIV. They combined several large data sets and constructed a map that revealed the countrywide geographic distribution of HIV-infected people. They found that about

20% live in urban areas and almost all rural communities have at least one HIV-infected person. The spatial dispersion of Lesotho's population may thus hinder and even prevent the elimination of HIV, and this situation may hold true for other predominantly rural countries in sub-Saharan Africa.

Sci Transl Med 2017; 9: eaag0019

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Capsule

A distinct role for Lgr5+ stem cells in primary and metastatic colon cancer

Cancer stem cells (CSCs) have been hypothesized to represent the driving force behind tumor progression and metastasis, making them attractive cancer targets. However, conclusive experimental evidence for their functional relevance is still lacking for most malignancies. De Sousa e Melo et al. showed that the leucine-rich repeat-containing G-protein-coupled receptor 5 (Lgr5) identifies intestinal CSCs in mouse tumors engineered to recapitulate the clinical progression of human colorectal cancer. The authors demonstrated that selective Lgr5+ cell ablation restricts primary tumor growth but does not result in tumor regression. Instead, tumors are maintained

by proliferative Lgr5- cells that continuously attempt to replenish the Lgr5+ CSC pool, leading to rapid re-initiation of tumor growth on treatment cessation. Notably, CSCs are critical for the formation and maintenance of liver metastasis derived from colorectal cancers. These data highlight distinct CSC dependencies for primary versus metastatic tumor growth and suggest that targeting CSCs may represent a therapeutic opportunity for managing metastatic disease.

Nature 2017;543:676

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