Consensus recommendations for optimizing electronic health records for nutrition care

Abstract

Provision of nutrition care is vital to the health and well-being of any patient who enters the health care system, whether in the ambulatory, inpatient, or long-term care setting. Interdisciplinary professionals—nurses, physicians, advanced practice providers, pharmacists, and dietitians—identify and treat nutrition problems or clinical conditions in each of these health care settings. The documentation of nutrition care in a structured format from screening and assessment to discharge allows communication of the nutrition treatment plans. The goal of this document is to provide recommendations to clinicians for working with an organization's Information Systems department to create tools for documentation of nutrition care in the electronic health record. These recommendations can also serve as guidance for health care organizations choosing and implementing health care software.

Introduction

Electronic health records (EHRs) offer access to patient information locally, regionally, and nationally, and facilitate coordination of care across health care settings. Health care clinicians who frequently provide direct patient care that influences nutrition care—nurses; pharmacists; medical providers, including physicians and advanced practice providers; and dietitians—will be referred to here as nutrition clinicians. Nutrition care of the patient in the inpatient, ambulatory, or long-term health care setting commences with screening and assessment. Known or suspected nutrition deficiencies or problems are addressed with information from nutrition screening and assessment. The first Nutrition Care Process flowchart was published in 1994 to propose nutrition care indicators to the Joint Commission on Accreditation of Healthcare Organizations (now referred to as The Joint Commission) for patient care with paper-based workflows.[1] More recently, the Academy of Nutrition and Dietetics (the Academy) published the Nutrition Care Process,[2,3] which is a systematic framework and language to guide nutrition and dietetics practitioners in documenting delivery of nutrition care. The American Society for Parenteral and Enteral Nutrition (ASPEN) developed Nutrition Care Pathways[4] to provide the interprofessional nutrition clinician a framework to guide nutrition care for pediatric (Figure 1) and adult patients (Figure 2). The pathways illustrate recommended steps from screening through discharge from a health care setting with a focus on

CONTRIBUTORS

Cassandra E. Kight, PhD, RDN, CNSC; Jean M. Bouche, RD, CD, CNSC; Angie Curry, RN, CCDS; David Frankenfield, MS, RD; Katy Good, RN, CCDS, CCS; Peggi Guenter, PhD, RN, FAAN, FASPEN; Brian Murphy, Constantina Papoutsakis, PhD, RD; Emily Brown Richards, RD, CND, CNSC; Vincent W. Vanek, MD, FACS, FASPEN; Deanne Wilk, RN, CCDS, CCS; Amy Wootton, RDN; Academy of Nutrition and Dietetics; American Society for Parenteral and Enteral Nutrition; Association of Clinical Documentation Integrity Specialists

malnutrition. However, the provision of nutrition care for any nutrition condition in any health care setting follows the pathway steps: identification, assessment, intervention, monitoring, and discharge planning.

Nutrition clinicians address inadequate or excessive food intake; nutrient deficiencies or nutrient excesses related to fluid, vitamins and/or minerals, alterations in gastrointestinal function from the mouth to the colon, malnutrition, and food insecurity; and education and counseling for nutrition and health issues. Health care costs in the United States in 2017 were $3.5 trillion.[5] Diagnoses with nutrition therapy as an important component include obesity, with health care costs of $147 billion to $210 billion per year[6]; diabetes, with annual costs of $327 billion[7]; and gastrointestinal, liver, and pancreatic diseases, with an estimated annual cost of $135.9 billion.[8] The direct medical costs for disease-associated malnutrition based on the National Health and Nutrition Examination Survey, excluding institutionalized participants, were estimated to be $15.5 billion annually.[9] The estimated costs of inpatient stays related to malnutrition accounted for nearly $49 billion, or 12.6% of aggregate hospital costs, compared to $389.1 billion for all non-maternal and non-neonatal inpatient stays.[10] It is imperative that nutrition clinicians document the identification of nutrition conditions with associated interventions to allow communication of the treatment plan to all clinicians in any health care setting. Nutrition diagnoses left unrecognized by lack

of identification or treatment and follow-up care contribute to the high costs of medical care.

The following consensus recommendations from a workgroup of ASPEN, the Academy, and the Association of Clinical Documentation Improvement Specialists outline opportunities for EHR optimization for various interprofessional activities presented within the framework of the ASPEN Nutrition Care Pathways. While the steps are identical for both pediatric and adult patients, the separate pathways vary in timeline and tools for each population during hospitalization. Therefore, the consensus recommendations apply to both pediatrics and adults, but differences between the patient populations will be identified, where appropriate. The consensus recommendations are appropriate for the patient at any entry point into the health care system. The task force, using this pathway, has provided recommendations for 1) nutrition screening and assessment; 2) nutrition diagnosis; 3) nutrition care plan and interventions; 4) monitoring, reassessment, and nutrition goals; and 5) discharge plan.

Each health care discipline documents information in the EHR in both structured and unstructured data formats. Structured data are data that reside in a fixed field, are stored in a database, and can be easily retrieved for reports, flowsheets, or graphs. Structured data are unambiguous; specific; and defined, usually within allowed parameters ranging from anthropometric data to specific parenteral nutrition (PN)

components. The nutrition clinician enters structured data directly into the EHR with information such as vital signs, nutrition assessment findings, orders, medications, procedures, and diagnoses; and views structured data in many forms, such as the above, and problem lists, allergies, and laboratory findings. Structured data options for entering information in the EHR can include checkboxes, dropdown lists, and radio buttons. The advantage to the end user of having structured data for nutrition care is to visually depict a patient's nutrition history within one view, such as a flowsheet report or graph. Structured data also enable increased semantic interoperability between EHR systems.[11] Unstructured data include text in clinical notes or comment boxes or scanned documents. Both data forms reflect the patient's nutrition history for communication to other providers and to the patient. There are small variations in the structured vs unstructured forms contained within different EHR platforms; however, this permits the end user to integrate both types of data into one report while developing the patient care plan.

The vendor and institution EHR implementation analysts are familiar with typical provider and care team workflows and understand the documentation requirements for providing patient care and appropriate billing. Build, implementation, and optimization of an EHR system should be a clinical project and not just an Information Systems project. Nutrition clinicians are the experts for

content and workflows and should be part of the EHR implementation and ongoing maintenance teams. ASPEN, the Academy, and the Association of Clinical Documentation Improvement Specialists have developed these consensus recommendations to guide EHR and related developers and implementation teams on the optimal build for documentation and treatment interventions involved in patient nutrition care to maximize the quality of patient care and health care team effectiveness and efficiency.

The recommendations found in the document do not constitute medical or other professional advice and should not be taken as such. To the extent that the information published herein may be used to assist in the care of patients, this is the result of the sole professional judgment of the attending health care professional whose judgment is the primary component of quality medical care. The information presented here is not a substitute for the exercise of such judgment by the health care professional. Circumstances in clinical settings and patient indications may require actions different from those recommended in this document and, in those cases, the judgment of the treating professional should prevail.

Nutrition screening

Nutrition screening is the first step in the ASPEN Nutrition Care Pathways to identify individuals at risk for malnutrition.[4] The Joint Commission promotes the use of standards of care for hospitals to provide safe and high-quality patient care. Its standards pertaining to nutrition screening and assessment are located in the section "Provision of Care, Treatment, and Services (PC.01.02.01)"[12]:

The goal of assessment is to determine the care, treatment, and services that will meet the patient's initial and continuing needs. Patient needs must be reassessed throughout the course of care, treatment, and services. Identifying and delivering the right care, treatment, and services depends on the following three processes:

1. Collecting information about the patient's health history as well as physical, functional, and psychosocial status.

2. Analyzing the information in order to understand the patient's needs for care, treatment, and services.

3. Making care, treatment, and services decisions based on the analysis of information collected.

The depth and frequency of assessment depends on a number of factors, including the patient's needs, program goals, and the care, treatment, and services provided. Assessment activities may vary between settings, as defined by the hospital's leaders. Information gathered at the patient's first contact might indicate the need for more data or a more intensive assessment. At a minimum, the need for further assessment is determined by the care, treatment, and services sought; the patient's presenting condition(s); and whether the patient agrees to the recommended care, treatment, and services.

The Elements of Performance state:

The hospital defines, in writing, the scope and content of screening, assessment, and reassessment. Patient information is collected according to these requirements.

In defining the scope and content of the information it collects, the organization may want to consider information that it can obtain, with the patient's consent, from the patient's family and the patient's other care providers, as well as information conveyed on any medical jewelry.

Assessment and reassessment information includes the patient's perception of the effectiveness of, and any side effects related to, his or her medication(s).

The hospital defines, in writing, criteria that identify when additional, specialized, or more in-depth assessments are performed. Note: Examples of criteria could include those that identify when a nutritional, functional, or pain assessment should be performed for patients who are at risk.

The hospital has defined criteria that identify when nutritional plans are developed.[12]

The nutrition screening tool in all health care settings should be easy and quick to score, as well as standardized and validated. There are

several standardized and validated nutrition screening tools available for adults,[13-16] but the availability of these tools is more limited for pediatric patients.[17,18] The nutrition screen is typically performed by a nurse or dietitian and is incorporated into the required office visit or hospital admission documentation for the patients that require nutrition screening. The generation of scores from screening tools in the EHR enables triggering of further workflow steps in the pathway through reports and alerts. Clinical Decision Support is a process that provides guidance to clinicians during patient care with configuration by the Information Systems staff of alerts to release at appropriate times in the workflow to improve efficiency and outcomes and avoid errors.[19] Clinical Decision Support interventions associated with nutrition screening include creation of a nutrition consult order when the screen value indicates risk or display of screen scores on the dietitian's daily patient unit reports. A structured data element for nutrition screening allows an organization to report their screening compliance during The Joint Commission's regularly scheduled audits and advises clinical nutrition managers and clinic managers whether there is adequate staffing to provide nutrition services. The Joint Commission has no requirements regarding a timeframe for rescreening hospitalized patients for nutrition risk if the initial screen was normal. However, ASPEN recommends a repeat nutrition screen every 3 to 7 days for adults and every 4 days for pediatric patients if the hospital admission nutrition screen determines the patient is not at risk for malnutrition.[14,20] A longer period before rescreening may be appropriate for patients in other care settings.

Nutrition assessment

The next step in the Nutrition Care Pathway is nutrition assessment.[4] A positive nutrition screen result should trigger an automatic notification to the dietitian for a nutrition assessment to be completed within the timeframe specified at each institution, as described here. Nutrition assessment data include food or nutrition-related history, biochemical data, medical tests, procedures, anthropometric measurements, client history, and nutrition-focused physical examination findings. Nutrition Care Pathway steps should be incorporated into the EHR build and workflow following the guidelines set forth by Health Level 7 (HL7) and the newly revised standards of the Electronic Nutrition Care Process Record System guidelines. HL7 International has undertaken a project in conjunction with the Academy to create an Electronic Nutrition Care Process Record System.[21] The goal is to develop a standard list of functions and criteria for integration of the Academy's Nutrition Care Process to align with the HL7 International EHR System Functional Model that provides a standard description and common understanding of functions for health care settings. The Academy has also developed the Consolidated Clinical Document Architecture *R2.1 Nutrition Transitions of Care Implementation Guide,* an HL7 standard that identifies what nutrition data should be included in an EHR in any transitions of care setting.[22] Transitions of care settings include home health agencies, inpatient rehabilitation facilities, long-term acute care hospitals, skilled nursing facilities, and community-based clinics or non-profits, such as those for diabetes prevention and treatment.

Nutrition diagnosis

The nutrition screening and assessment steps of the Nutrition Care Pathway result in identification of nutrition problems that require treatment by nutrition clinicians. The Academy's Nutrition Care Process utilizes nutrition diagnosis to standardize nutrition diagnostic terminology.[2] A nutrition diagnosis as defined by the Academy describes a specific nutrition problem that can be improved or resolved through nutrition interventions. The domains of nutrition diagnosis include "intake," which is defined as too much or too little of a food or nutrient compared to actual or estimated needs; "clinical" is defined as nutrition problems that relate to medical or physical conditions; and "behavioral-environmental" is defined as knowledge, attitude, beliefs, physical environment, access to food, or food safety.[23] A medical diagnosis, on the other hand, is used by health care providers and coders as described in the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10)*[24] codes. Documentation of the nutrition diagnosis used by dietitians

and ICD-10 codes used by providers both describe problems that require nutrition intervention and treatment to resolve to improve patient health and well-being.

Malnutrition is one nutrition (clinical domain) and medical diagnosis (ICD-10 code) that affects patient care as well as appropriate coding, billing, and reimbursement.[25] Patients can be diagnosed with malnutrition in any health care setting. Organizations should adopt explicit malnutrition criteria that all health care professionals can apply consistently. Developing malnutrition criteria that include representatives from nutrition and medicine with clinical documentation integrity and coding departments improves malnutrition documentation required for billing. The Academy and ASPEN published recommended criteria for the identification of adult[26] and pediatric[27] malnutrition. The malnutrition diagnoses have been mapped to ICD-10 codes: mild protein-calorie malnutrition is E44.1, moderate protein-calorie malnutrition is E44.0, and (unspecified) severe protein-calorie malnutrition is E43. Many hospitals have adopted the Academy and ASPEN consensus criteria for malnutrition as written, or developed their own clinical indicators by addition or removal of criteria. Comprehensive documentation by the nutrition care clinician and the medical providers to support compliant coding and capture of the nutrition diagnosis includes: 1) the diagnosis and its severity, for example, severe protein-calorie malnutrition, documented by a provider (physician, advanced practitioner provider); 2) the clinical indicators to support the diagnosis, for example, weight loss of 10% in a 3-month time frame; 3) development of a treatment plan to address the diagnosis of malnutrition, for example, initiation of enteral nutrition (EN); 4) progress and/or changes in patient's status in reassessment notes, for example, patient tolerating goal EN and weight loss stopped. Malnutrition is a secondary diagnosis that can affect the Medicare Severity-Diagnosis Related Group Complications or Comorbidities and Major Complications or Comorbidities.[28] While nutrition clinicians usually diagnose malnutrition, it is imperative that this diagnosis is documented in structured data format for automatic inclusion in the attending physician/team documentation templates to document how the diagnosis impacted treatment, nursing care, and length of stay.[29] Addition of the malnutrition diagnosis to the problem list by the physician, or nutrition clinician if allowed by organizational policies, facilitates transfer of the diagnosis across and between health care systems.

The nutrition diagnosis section of the EHR incorporates information from nutrition screening and assessment to generate the plan of care to treat nutrition problems that will be described in the nutrition interventions. Documenting a nutrition diagnosis has the potential to direct nutrition interventions and the resources required to care for the patient. Accurate documentation by physicians and advanced practice providers must be present to support coding, reimbursement, benchmarking, and high-quality patient care.[29]

Nutrition care plan and intervention

A nutrition care plan based on data gathered in the nutrition assessment will address identified nutrition diagnoses. The care plan defines specific nutrition interventions to alter or eliminate the etiologies of nutrition problems. It also includes goals to describe the anticipated response to these interventions. Interventions are a planned set of specific behaviors or actions performed, which are delegated, coordinated, or recommended by a nutrition clinician that facilitates achievement of the desired goals, such as improved intake with nutrition support, weight stabilization, or improved wound healing. Nutrition care plans are documented by all nutrition clinicians, though they are typically discipline-specific and not integrated. Appropriate documentation and ordering in the EHR will help improve the likelihood that patients receive the indicated nutrition intervention and treatment. Documentation of the treatment care plan helps ensure that all members of the health care team know the interventions needed to address a patient's nutrition diagnoses.

Nutrition interventions include oral diets, oral nutrition supplements (ONS), EN, and PN. Nutrition interventions also include nutrition-related medications or supplements, such as vitamin or mineral

preparations, as well as assessing for and making changes in nutrition therapies to prevent or treat drug–nutrient interactions. Nutrition education and nutrition counseling for the patient and family, as well as coordination of nutrition care, are other types of nutrition interventions that can be vital to improving or maintaining nutrition status.[23] The EHR system should accommodate and be configured within an organization to allow the appropriate ordering and documentation of these interventions.

Diet orders can be simple or complex, with multiple modifications. The order functionality in the EHR should promote easy and clear application of necessary diet restrictions, including dysphagia modifications and assistance with feeding or environmental alterations. The Academy's Nutrition Care Manuals include appropriate diets for many nutrition care settings.[30,31] The diet orders in the Nutrition Care Manuals provide guidance for the naming convention and types of diets to configure in the diet order module. Some diet orders require a single selection, while others require multiple select options. The health care organization determines standard definitions for nutrient levels, such as potassium, protein, and fiber, which should be clear to the clinicians ordering and implementing these orders. When the diet order changes due to short-term nil per os status or addition of a new modification, the EHR should carry the parameters over from the previous diet to the new diet order with the ability of the clinician to modify

these parameters as needed. For example, if a patient is on a consistent carbohydrate diet and the cardiology consultant subsequently changes the diet to heart-healthy, the consistent carbohydrate restriction should remain by default. ONS orders should be configured to allow flexibility on the type of supplement and timing of administration of the supplement to meet the patient's needs. H7 diet order standards are available to assist in the build and implementation of electronic transmission of nutrition orders.[32] Foodservice computer systems are often integrated with the EHR and employ electronic transmission of nutrition orders using HL7 standards.

The use of standardized electronic EN orders improves patient safety by reducing the opportunities for incomplete, ambiguous, or incorrect EN orders.[33] Critical components of the EN order include the EN formula name, the delivery site (ie, route), the administration method (eg, continuous, cyclic, or bolus), the rate of infusion with goal rate or volume, and water flush instructions. The use of required fields within the EN order for these critical components will prevent order submission until the order is complete. A free text comment box in the EN order allows for entry of order instructions to clarify administration instructions. An EN order set that includes these details for the diet order and orders for laboratory monitoring, assessment of tolerance, and consults could be developed by organizations.[33] Implementation of scanning software with the EHR would increase the accuracy

of delivering the right product to the right patient at the right time, as has been demonstrated in the neonatal intensive care unit[34] and children's hospitals.[35]

PN is a high-alert medication that is best ordered using a computerized provider order entry system.[36] The PN order components should be available in the computerized provider order entry system with all PN ingredients in full generic name with specific ordering amounts per day for adult patients and per kilogram per day for neonatal and pediatric patients. Clinical Decision Support can alert those prescribing PN when order components exceed recommended or safe clinical limits or exceed limits of compatibility. Other important order requirements of the computerized provider order entry include patient dosing weight, indications for PN, route of administration (central vein or peripheral vein), method of administration (continuous vs cyclic), PN administration date and time, and PN instructions for total volume and infusion rate. The EHR should be able to transmit these orders via direct interface to an automated compounding device to avoid manual transcription of the electronic PN orders into the automated compounding device, which increases the chances of a transcription error. ASPEN, the Academy, and the American Society of Health-System Pharmacists have published joint consensus recommendations that address, in more detail, the PN functionality needed in an EHR.[37]

Historically, providers, that is, practitioners with independent

prescriptive authority, including physicians, advanced practice nurses, and physician assistants, ordered the nutrition therapies for hospitalized patients, including oral diets, ONS, EN, and/or PN, per Centers for Medicare & Medicaid Service regulations. However, in 2014, the Centers for Medicare & Medicaid Service Conditions of Participation were revised to allow dietitians and other qualified nutrition clinicians to independently order therapeutic diets, ONS, EN, PN, and nutrition-related laboratory and imaging tests, if within the clinician's scope of practice per the state laws and regulations, and the hospital's medical staff rules, regulations, and bylaws.[38] In 2016, these conditions were extended to long-term care settings.[39] These privileges may require a nutrition clinician consult from the provider requesting that they order these therapies. If the nutrition clinician is unable to place the nutrition support order per their health care privileges, options include pending or holding the order for prescribing providers to review and sign. Other considerations would be to implement electronic notifications to review, advance, or change an order based on laboratory values, intake and output, medications, and physical assessment findings. Electronic order sets may enhance the order process, as well as provide consistent treatment plans among providers and organizations.[33,36]

Nutrition monitoring and evaluation

The monitoring and evaluation (reassessment) step of the Nutrition Care Pathway is vital to resolution of the nutrition diagnoses. It is the step in which a nutrition clinician determines whether the Nutrition Care Plan is helping to resolve nutrition problems or if it needs revision. ASPEN recommends follow-up within 3 days for hospitalized patients diagnosed with malnutrition.[40] During initial hospital assessment, the nutrition clinician should designate a time for reassessment(s) in accordance with hospital policies. If the patient is seen in an ambulatory setting, follow-up appointments are typically scheduled when the initial reason for visit cannot be resolved in one visit. Data in the nutrition reassessment include information that has accrued since the initial assessment, including oral diet, ONS, EN, PN, and other nutrient intake; new or changed biochemical results; medical tests and procedures; serial anthropometric measurements; and nutrition-focused physical findings. When the nutrition clinician documents the reassessment findings, the previously established nutrition diagnoses and goals should auto-populate, ensuring consistency in care. Language to describe the status of the nutrition goals may include resolved, unresolved, improvement shown, or no longer appropriate.

The use of structured data to capture nutrition reassessment parameters improves efficiency of the clinician's daily tasks with integration of intake data with anthropometrics and biochemical data to revise nutrition orders, such as for EN or PN. Structured data at the facility level are key to data-driven quality improvement initiatives to meet organizational mission, goals, and strategic plans. Consistency between health care facilities is key to conducting large-scale nutrition outcomes research, such as the Malnutrition Quality Improvement Initiative, which includes recommendations for electronic clinical quality measures for all steps of the Nutrition Care Pathway.[41] The clinical quality measures developed include those for nutrition screening, assessment, diagnosis, and interventions.

In monitoring nutrition and evaluation, the use of a template format, such as the Consolidated Clinical Document Architecture, will not only create a standardized approach to nutrition documentation, but will also promote nutrition interoperability across the care spectrum.[22] The template will improve transition of nutrition care upon discharge from the hospital to the next care setting.

Discharge plan

Discharge planning is an interdisciplinary approach to provide continuity of care. It is a process that begins at admission when the provider determines anticipated post-hospital services and planning that includes the patient and family,[42] development of a structured discharge plan tailored to meet the individual's needs,[43] and discharge coordination rounds with interdisciplinary participants to ensure completion of discharge teaching.[44,45] Inclusion of resolved and unresolved nutrition diagnoses, especially malnutrition, in the hospital discharge

summary provides valuable information to the primary care, referring, or next-setting physician for ongoing treatment. Electronic discharge orders and instructions should include ongoing nutrition support as appropriate, frequency of follow-up evaluation by the health care team for laboratory studies, nutrition reassessment, and physical examination.

Patients should receive after-hospital or clinic visit summaries, which are generated from structured data and embedded clinical documentation, such as care instructions. Components of the nutrition plan include the interventions recommended by the nutrition clinician, along with recommendations for follow-up care. If nutrition education was an intervention to address a nutrition diagnosis, the EHR should provide a link to the educational material for future reference. When patients need EN or PN, the EHR should generate a form with the patient's prescription or order for the home infusion company or durable medical equipment agency. The home nutrition support company will need the same information discussed here under nutrition interventions for EN and PN, such as product, formulation, and rate and time of administration, and the name of the physician who will provide post-discharge care. Vitamins and minerals and other medications appropriate to the Nutrition Care Plan prescribed through the medication administration module will be transmitted electronically to the patient's pharmacy or next facility.

The Joint Commission has standards that address transitions of care and has an initiative underway to offer various interventions and resources to improve these transitions of care. The Joint Commission requires that the active issues, diagnosis, medications, required services, warning signs of worsening conditions, and whom to contact 24 hours per day, 7 days per week in case of an emergency be provided to the patient and/or caregivers in an alternate care setting on hospital discharge.[46] When being discharged to an alternative care setting, many hospitals send a Continuity of Care form along with the patient that documents these items and other pertinent information. The Continuity of Care form should be integrated into the EHR, such that it is easy to find and review. Paper Continuity of Care forms may get lost or delayed in getting scanned into the EHR and, once scanned, may be difficult to find for review.

Conclusions

An EHR presents patient data in digital format to be used for the provision of medical care, shared across health care settings within and between organizations, for the patient's personal health record, and for population health studies. The technology of EHRs is ever-changing, where now clinicians can take patient photos and store to their medical record to document muscle and fat depletion or vitamin and mineral deficiencies using their personal phone, for example. EHRs offer the nutrition clinician the ability to track important steps in the provision of nutrition care that follow the ASPEN Nutrition Care Pathways—nutrition screening and assessment, documentation of the nutrition diagnosis, the nutrition care plan and associated interventions, reassessment of data to determine whether nutrition goals are improving the nutrition diagnosis, and the nutrition discharge plan for ongoing treatment of unresolved nutrition problems. The EHR can provide tools for the nutrition clinician to document nutrition data in structured and unstructured data that communicate the patient's nutrition history from one clinician to the next. The nutrition leaders in an organization should ensure their technologically savvy clinicians advocate for the needs of their colleagues with the Information System teams who are responsible for the build and maintenance of the system for their department. The appointed technologically savvy clinicians should also participate in ongoing improvement and maintenance to meet the ever-changing best practices of nutrition care.

References

1. Kushner RF, Ayello EA, Beyer PL, et al. National Coordinating Committee for Nutrition Standards clinical indicators of nutrition care. J Am Diet Assoc. 1994;94(10):1168–1177.

2. Swan WI, Vivanti A, Hakel-Smith NA, et al. Nutrition Care Process and Model update: Toward realizing people-centered care and outcomes management. J Acad Nutr Diet. 2017;117(12):2003–2014.

3. Swan WI, Pertel DG, Hotson B, et al. Nutrition Care Process (NCP) update part 2: Developing and using the NCP terminology to demonstrate efficacy of nutrition care and related outcomes. J Acad Nutr Diet. 2019;119(5):840–855.

4. Adult and pediatric nutrition care pathways. ASPEN website. http://www.nutritioncare.org/guidelines_and_clinical_resources/Malnutrition_Solution_Center/. Accessed March 3, 2019.

5. National health expenditure data. Centers for Medicare & Medicaid Services website. *www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nationalhealthaccountshistorical.html*. Accessed May 3, 2019.

6. The healthcare costs of obesity. The State of Obesity website. *www.stateofobesity.org/healthcare-costs-obesity/*. Accessed May 3, 2019.

7. The cost of diabetes. American Diabetes Association website. *www.diabetes.org/advocacy/news-events/cost-of-diabetes.html*. Accessed May 3, 2019.

8. Peery AF, Crockett SD, Murphy CC, et al. Burden and cost of gastrointestinal, liver, and pancreatic diseases in the United States: Update 2018. *Gastroenterology*. 2019;156(1):254–272 e211.

9. Goates S, Du K, Braunschweig CA, Arensberg MB. Economic burden of disease-associated malnutrition at the state level. *PLoS* One. 2016;11(9):e0161833.

10. Barrett MLBM, Owens PL. Non-maternal and non-neonatal inpatient stays in the United States involving malnutrition, 2016. US Agency for Healthcare Research and Quality. *www.hcup-us.ahrq.gov/reports/HCUPMalnutritionHospReport_083018.pdf*. Published August 30, 2018. Accessed March 7, 2019.

11. Interoperability and health information exchange. HIMSS website. *www.himss.org/library/interoperability-health-information-exchange*. Accessed May 3, 2019.

12. The Joint Commission E-Dition. *https://e-dition.jcrinc.com*. Accessed January 7, 2019.

13. Anthony PS. Nutrition screening tools for hospitalized patients. *Nutr Clin Pract*. 2008;23(4):373–382.

14. Mueller C, Compher C, Ellen DM; American Society for Parenteral and Enteral Nutrition (A.S.P.E.N) Board of Directors. A.S.P.E.N. clinical guidelines: Nutrition screening, assessment, and intervention in adults. *JPEN J Parenter Enteral Nutr*. 2011;35(1):16–24.

15. Correia MITD. Nutrition screening vs nutrition assessment: What's the difference? *Nutr Clin Pract* 2018;33(1):62–72.

16. Academy of Nutrition and Dietetics, Evidence Analysis Library. Nutrition screening in adults, 2016-2018. *www.andeal.org/topic.cfm?menu=5382*. March 5, 2019.

17. White M, Lawson K, Ramsey R, et al. Simple nutrition screening tool for pediatric inpatients. *JPEN J Parenter Enteral Nutr*. 2016;40(3):392–398.

18. Academy of Nutrition and Dietetics, Evidence Analysis Library. Nutrition screening pediatrics. *www.andeal.org/topic.cfm?menu=5767*. Accessed March 5, 2019.

19. What is Clinical Decision Support (CDS)? HealthIT.gov website. *www.healthit.gov/topic/safety/clinical-decision-support*. Accessed June 4, 2019.

20. Ukleja A, Gilbert K, Mogensen KM, et al. Standards for nutrition support: Adult hospitalized patients. *Nutr Clin Pract*. 2018;33(6):906–920.

21. Project Summary for Electronic Nutrition Care Process Record System (ENCPRS) Functional Profile. HL7 International website. *www.hl7.org/special/committees/projman/searchableprojectindex.cfm?action=edit&ProjectNumber=706*. Accessed March 5, 2019.

22. Project Summary for HL7 CDA R2 Implemenation Guide: C-CDA R2.1 Supplemental Templates for Nutrition, Release 1 (US Realm). HL7 International website. *www.hl7.org/special/Committees/projman/searchableProjectIndex.cfm?action=edit&ProjectNumber=1371*. Accessed March 5, 2019.

23. Electronic Nutrition Care Process Terminology (eNCPT) Reference Manual: Dietetics Language for Nutrition Care. Academy of Nutrition and Dietetics website. *www.ncpro.org*. Accessed June 7, 2019.

24. World Health Organization. *International Statistical Classification of Diseases and Related Health Problems, 10th Revision*. Geneva, Switzerland: World Health Organization; 2012.

25. Giannopoulos GA, Merriman LR, Rumsey A, Zwiebel DS. Malnutrition coding 101: Financial impact and more. *Nutr Clin Pract*. 2013;28(6):698–709.

26. White JV, Guenter P, Jensen G, et al. Consensus statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics recommended for the identification and documentation of adult malnutrition (undernutrition). *JPEN J Parenter Enteral Nutr*. 2012;36(3):275–283.

27. Becker P, Carney LN, Corkins MR, et al. Consensus statement of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition: Indicators recommended for the identification and documentation of pediatric malnutrition (undernutrition). *Nutr Clin Pract*. 2015;30(1):147–161.

28. Phillips W. Accurate documentation of malnutrition diagnosis reflects increased healthcare resource utilization. *Nutr Clin Pract*. 2015;30(5):604–608.

29. Phillips W, Browning M. A clinician's guide to defining, identifying and documenting malnutrition in hospitalized patients. *Pract Gastroenterol*. 2017;41(11):19–33.

30. Academy of Nutrition and Dietetics. Nutrition Care Manual. *www.*

nutritioncaremanual.org/. Accessed January 7, 2019.

31. Academy of Nutrition and Dietetics. Pediatric Nutrition Care Manual. *www.nutritioncaremanual.org/*. Accessed January 7, 2019.

32. HL7 Version 3 Domain Analysis Model: Diet and Nutrition Orders, Release 2. HL7 International website. *www.hl7.org/implement/standards/product_brief.cfm?product_id=289*. Accessed June 5, 2019.

33. Boullata JI, Carrera AL, Harvey L, et al. ASPEN Safe Practices for Enteral Nutrition Therapy. *JPEN J Parenter Enteral Nutr*. 2017;41(1):15–103.

34. Oza-Frank R, Kachoria R, Dail J, Green J, Walls K, McClead RE Jr. A quality improvement project to decrease human milk errors in the NICU. *Pediatrics* 2017;139(2).

35. Steele C, Bixby C. Centralized breastmilk handling and bar code scanning improve safety and reduce breastmilk administration errors. *Breastfeed Med*. 2014;9(9):426–429.

36. Ayers P, Adams S, Boullata J, et al. A.S.P.E.N. parenteral nutrition safety consensus recommendations. *JPEN J Parenter Enteral Nutr*. 2014;38(3):296–333.

37. Vanek VW, Ayers P, Kraft M, et al. A call to action for optimizing the electronic health record in the parenteral nutrition workflow: Executive summary. *Nutr Clin Pract*. 2018;33(5):594–596.

38. Centers for Medicare & Medicaid Services. Medicare and Medicaid programs; regulatory provisions to promote program efficiency, transparency, and burden reduction; Part II. *www.federalregister.gov/documents/2014/05/12/2014-10687/medicare-and-medicaid-programs-regulatory-provisions-to-promote-program-efficiency-transparency-and*. Accessed March 5, 2019.

39. Centers for Medicare & Medicaid Services. Medicare and Medicaid programs; reform of requirements for long-term care facilities. *www.federalregister.gov/documents/2016/10/04/2016-23503/medicare-and-medicaid-programs-reform-of-requirements-for-long-term-care-facilities*. Accessed March 5, 2019.

40. American Society for Parenteral and Enteral Nutrition. *Improve Patient Outcomes: A.S.P.E.N.'s Step-by-Step Guide to Addressing Malnutrition*. Silver Spring, MD: American Society for Parenteral and Enteral Nutrition; 2015.

41. McCauley SM. Malnutrition care: Preparing for the next level of quality. *J Acad Nutr Diet*. 2016;116(5):852–855.

42. Mennuni M, Gulizia MM, Alunni G, et al. ANMCO Position Paper: Hospital discharge planning: Recommendations and standards. *Eur Heart J Suppl*. 2017;19(suppl D):D244–D255.

43. Shepperd S, McClaran J, Phillips CO, et al. Discharge planning from hospital to home. *Cochrane Database Syst Rev*. 2010;1:CD000313.

44. Bobay K, Bahr SJ, Weiss ME, Hughes R, Costa L. Models of discharge care in Magnet® hospitals. *J Nurs Adm*. 2015;45(10):485–491.

45. Weiss ME, Bobay KL, Bahr SJ, Costa L, Hughes RG, Holland DE. A model for hospital discharge preparation: From case management to care transition. *J Nurs Adm*. 2015;45(12):606–614.

46. The Joint Commission. Transitions of care: The need for a more effective approach to continuing patient care. *www.jointcommission.org/assets/1/18/Hot_Topics_Transitions_of_Care.pdf*. Accessed March 7, 2019.

Figure information

■ Figure 1. American Society for Parenteral and Enteral Nutrition pediatric nutrition care pathway. (Reprinted with permission from ASPEN Copyright 2015.)

■ Figure 2. American Society for Parenteral and Enteral Nutrition adult nutrition care pathway. (Reprinted with permission from ASPEN Copyright 2015.)

Author information

C. E. Kight is a clinical nutrition Specialist, UW HealtheUniversity of Wisconsin Hospitals and Clinics, Madison. J. M. Bouche is a nutrition support dietitian, Option Care, Wauwatosa, WI. A. Curry is a senior consultant and client services manager, Healthcare Division, Nuance Communications, Burlington, MA. D. Frankenfield is a manager and nutrition support dietitian and D. Wilk is a manager, clinical documentation improvement, Penn State Health, Hershey, PA. K. Good is a manager, education services, Enjoin, Collierville, TN. P. Guenter is senior director of clinical practice, quality, and advocacy, American Society for Parenteral and Enteral Nutrition, Silver Spring, MD. B. Murphy is director, Association of Clinical Documentation Improvement Specialists, Middleton, MA. C. Papoutsakis is senior director, Data Science Center, Academy of Nutrition and Dietetics, Chicago, IL. E. Brown Richards is a clinical dietitian, New York-Presbyterian Brooklyn Methodist Hospital, Brooklyn, NY. V. W. Vanek is regional medical informatics officer, Mercy Health Youngstown Region, Youngstown, OH. A. Wootton is director of nutrition management, MatrixCare, Bloomington, MN.

Figure 1. American Society for Parenteral and Enteral Nutrition pediatric nutrition care pathway. (Reprinted with permission from ASPEN Copyright 2015.) EMR/MR as used in this figure is equivalent to Electronic Health Records (EHR).

DOCUMENT MALNUTRITION
[RD, MD/NP/PA]

- RD to document malnutrition severity, chronicity and supporting evidence
- MD to document severity of malnutrition in progress note and add diagnosis to hospital problem list

CODE MALNUTRITION

- Notify coder (EMR flag, call, email)
- Appropriate pediatric codes

INTERVENTION
[RD, RN, MD/NP/PA, SW, PharmD, PT, OT, SLP]

- Oral Nutrition and/or Vitamin/Mineral Supplements
- Medically & Developmentally Appropriate Diet
- Nutrition Support (Enteral, Parenteral)
- Education (Malnutrition, Increasing calories/protein)
- Medical therapy (Treat reflux, Nausea, Malabsorption, Constipation, Diarrhea, Feeding problems, Infection, Spasticity, Muscle weakness)

MONITOR, EVALUATE & ATTEND MEDICAL ROUNDS
[RD, RN, MD/NP/PA, SW, PharmD, PT, OT, SLP]

- Daily Weights (<12 months old) or Daily to 2x/week Weights (>12 months old)
- Weekly Height/Length, HC (<2 years old), MUAC
- Biochemical Data/Medical Tests & Procedures
- Intake/Output
- Gastrointestinal Tolerance
- Access Devices (feeding tubes, central venous access)
- Nutrition Focused Physical Exam (NFPE)

NUTRITION REASSESSMENT [RD, NST]

NUTRITION STATUS IMPROVING? — NO →

RE-EVALUATE CARE PLAN
[MD/NP/PA, RD, RN, SW, PharmD, PT, OT, SLP]

- Rule out Medical/Social Causes
- Feeding Evaluation
- Optimize Nutrition Intervention

YES

CONTINUE CURRENT PLAN/MONITOR
[RD, RN, MD, NP/PA, SW, PharmD, PT, OT, SLP]

aspen
LEADING THE SCIENCE AND PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition
© 2015 American Society for Parenteral and Enteral Nutrition. All rights reserved.

NO — **PATIENT READY FOR DISCHARGE?**

YES

DISCHARGE PLAN
[MD, RD, RN, PharmD, SW]

- Nutrition Education
- Order Home Enteral or Parenteral Nutrition Supplies
- Order Oral Nutritional Supplements (Prescription, WIC form)
- Identify Medical Team for Home Management
- Schedule Follow Up Appointment with Medical Team
- Place Home Care Orders (Home Weights, Nurse Visits)
- Obtain and Document Discharge Weight, Length, HC, MUAC
- Communicate Discharge Anthropometrics and Nutrition Care Plan with Managing Home Medical Team

KEY

- Action Steps
- Documentation Steps
- Communication Steps

RN Registered Nurse
RD Registered Dietitian
NST Nutrition Support Team
MD Medical Doctor
NP Nurse Practitioner
PA Physician Assistant
PharmD Pharmacist
SW Social Worker

MA Medical Assistant
OT Occupational Therapist
PT Physical Therapist
SLP Speech-Language Pathologist
NPO/ CLD Nothing by mouth/Clear Liquid Diet
EMR/MR Electronic Medical Record or Medical Record
HC Head circumference
MUAC Mid-upper arm circumference
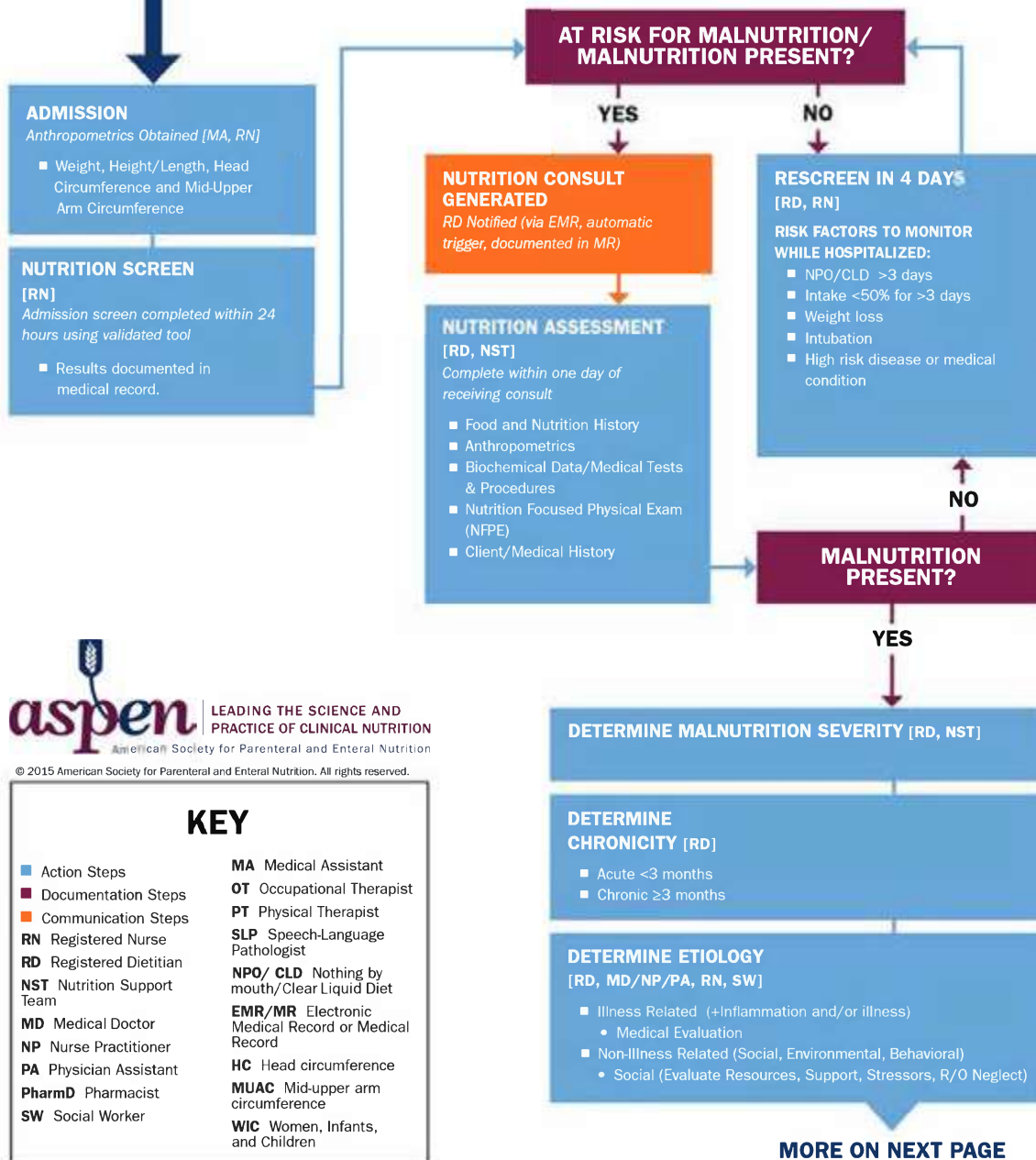**WIC** Women, Infants, and Children

Figure 1. *Continued.*

Figure 2. American Society for Parenteral and Enteral Nutrition adult nutrition care pathway. (Reprinted with permission from ASPEN Copyright 2015.) EMR/MR as used in this figure is equivalent to Electronic Health Records (EHR).
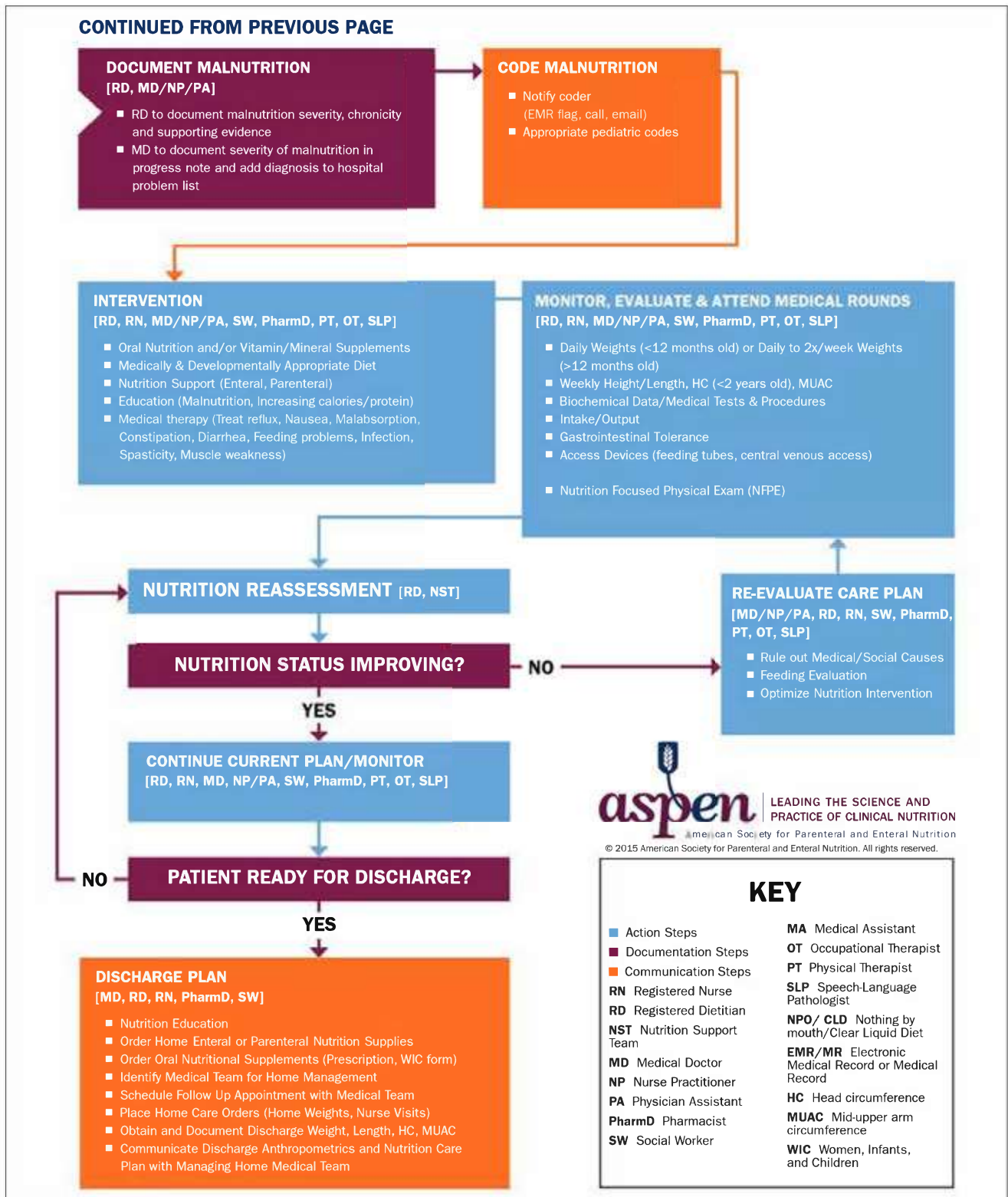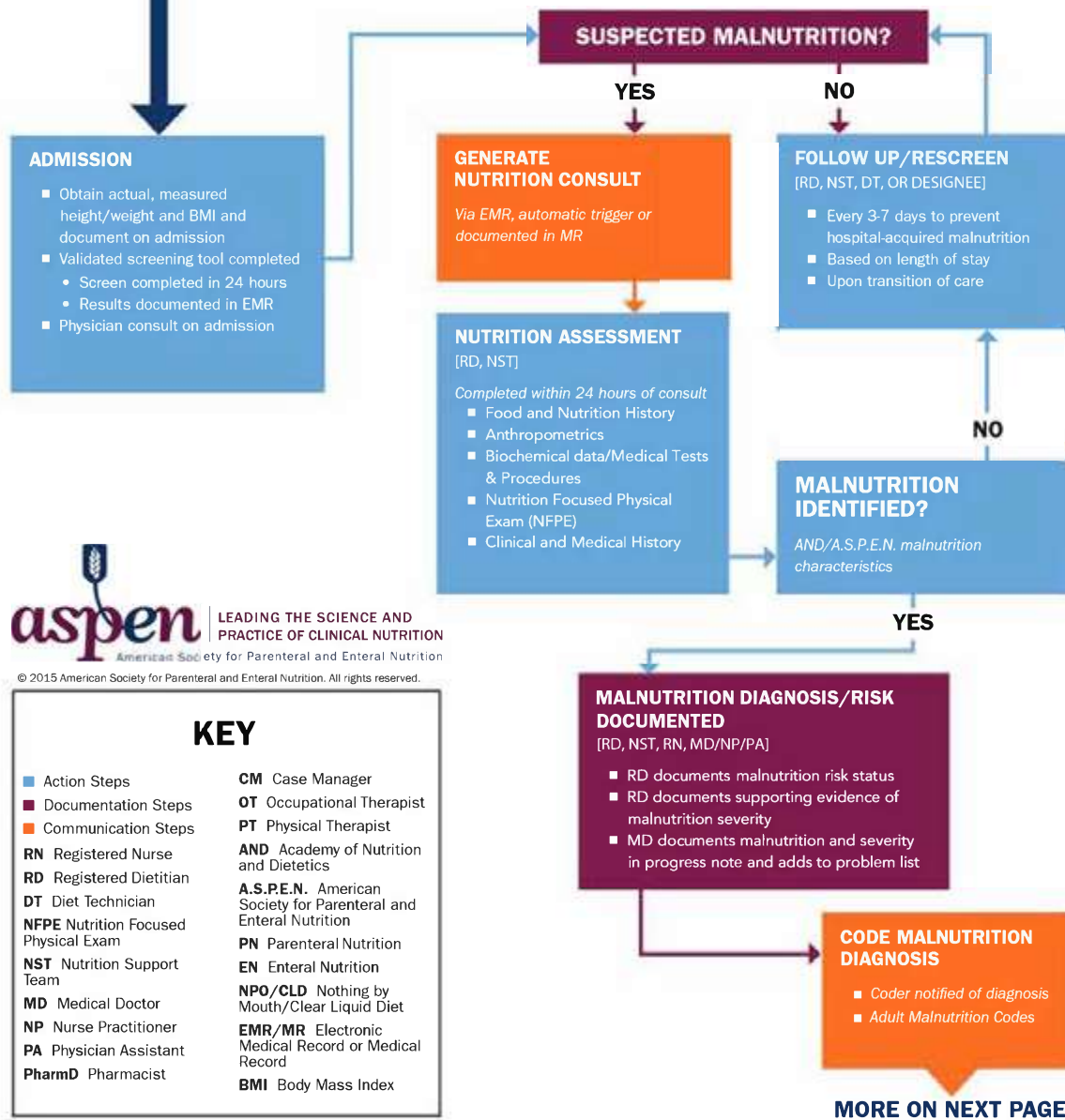
CONTINUED FROM PREVIOUS PAGE

NUTRITION CARE PLAN AND INTERVENTION
[RD, NST, RN, MD/PA/NP, PharmD]

- Nutrition care plan created & documented; goals identified
- Initiate order/identify type of nutrition support required
  - Provide least restrictive, medically appropriate diet
  - Determine need for nutritional supplementation
  - Treatment of medical issues impacting nutrition intake and utilization
- Determine access needs for specialized nutrition support to maximize nutritional intake (Enteral feeding tubes, IV access for PN)
  - Review medications regarding impact on nutritional intake
- Communicate nutrition care plan with team members on multidisciplinary patient care rounds
- Educate patient/caregiver regarding plan of care.

MONITORING & EVALUATION
[RD, NST, RN, MD/PA/NP, PharmD, PT, OT]

- Follow-up within 3 days
- Monitoring parameters
  - Tolerance of nutrient intake
  - Oral intake including supplements, vitamins, minerals
  - Enteral/Parenteral intake
  - Anthropometric data (weight trends)
  - Biochemical data
  - Functional status

REVISE NUTRITION CARE PLAN

NO ←

DOCUMENT PARAMETERS THAT INDICATE IMPROVEMENT IN NUTRITION STATUS
[RD, NST, PT, OT]

- Adequate nutrient intake
- Stable or increased weight
- Stability of biochemical data
- Improved strength and function

YES

CONTINUE CURRENT NUTRITION CARE PLAN

- Reassess every 3-5 days
- Begin discharge planning

DISCHARGE PLAN
[RD, RN, MD/PA/NP, PharmD, CM]

- Education / Counseling with patient and caregivers
- Communication of PN, EN or Oral Nutrition Supplement prescription
- Case management for continuity of care
- Outpatient follow-up as appropriate

aspen
LEADING THE SCIENCE AND PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition

KEY

- ■ Action Steps
- ■ Documentation Steps
- ■ Communication Steps

RN Registered Nurse
RD Registered Dietitian
DT Diet Technician
NFPE Nutrition Focused Physical Exam
NST Nutrition Support Team
MD Medical Doctor
NP Nurse Practitioner
PA Physician Assistant
PharmD Pharmacist

CM Case Manager
OT Occupational Therapist
PT Physical Therapist
AND Academy of Nutrition and Dietetics
A.S.P.E.N. American Society for Parenteral and Enteral Nutrition
PN Parenteral Nutrition
EN Enteral Nutrition
NPO/CLD Nothing by Mouth/Clear Liquid Diet
EMR/MR Electronic Medical Record or Medical Record
BMI Body Mass Index

Figure 2. *Continued.*