

Forum

## Addressing Disease-Related Malnutrition in Hospitalized Patients: A Call for a National Goal

Peggi Guenter, PhD, RN, FAAN; Gordon Jensen, MD, PhD, FASPEN; Vihav Patel MD, FACS, CNSC; Sarah Miller, PharmD, BCNSP; Kris M. Mogensen, MS, RD, LDN, CNSC; Ainsley Malone, MS, RD, CNSC, FAND; Mark Corkins, MD, SPR, CNSC, FAAP; Cindy Hamilton, MS, RD; Rose Ann DiMaria-Ghalili, PhD, RN, CNSC, FASPEN

In 1983 the Board of Directors of the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.)<sup>1</sup> developed a special communication on malnutrition in hospitalized patients, which stated, in part, as follows:

The state of malnutrition appears to affect patient morbidity and mortality rates. It is associated with an increased incidence of wound infection, fluid and electrolyte imbalances, depressed ventilatory response, decreased response to certain chemotherapy programs, decreased tolerance to some therapeutic regimens, depressed immune mechanism, all of which translate into an increase in medical care cost and increase in morbidity and mortality.

The prevalence of malnutrition in hospitalized patients depends on the population surveyed and on the quality of nutritional screening. The presence of a Nutritional Support Service or individuals knowledgeable in clinical nutrition should enhance the ability to identify patients with nutritional deficiencies, and to provide effective nutritional support.

The recognition and appreciation by the medical profession of the prevalence of malnutrition should lead to more thorough nutritional monitoring of patients, thereby ensuring the appropriate delivery of nutritional support.<sup>2(p. 219)</sup>

This consensus statement still remains relevant today.

In 1995 The Joint Commission partnered with A.S.P.E.N., the American Society of Clinical Nutrition (now the American Society of Nutrition [ASN]<sup>3</sup>), and the American Dietetic Association (now the Academy of Nutrition and Dietetics<sup>4</sup>) to develop survey accreditation standards that emphasized interdisciplinary delivery of nutrition care and required that all patients have a nutrition screening within 24 hours of admission.<sup>5,6\*</sup>

It is the position of A.S.P.E.N. that addressing disease-related malnutrition in hospitalized patients should be a national goal

in the United States and thereby help to improve patient outcomes by reducing morbidity, mortality, and costs. A malnutrition-focused national goal would better overtly address the issue of disease-related malnutrition to alert health care organizations on the need to provide optimal nutrition care.

### Current State of Malnutrition in Hospitalized Patients

For the purpose of this article, *disease-related malnutrition* is defined as “undernutrition as a result of a disease process,” which may be present on admission or acquired during a hospitalization. Undernutrition may occur even in the face of a high body mass index (BMI), as it is common for obese patients to be undernourished in the setting of disease or surgery.<sup>7</sup> The most recent conceptual model for disease-related malnutrition was proposed by an A.S.P.E.N. and European Society for Clinical Nutrition and Metabolism (ESPEN) International Consensus Guideline Committee, which developed an etiology-based approach to the diagnosis of adult malnutrition in clinical settings, with adult malnutrition described in the context of acute illness or injury, chronic diseases or conditions, and starvation-related malnutrition.<sup>8,9</sup>

It is estimated that at least one third of patients in developed countries are malnourished on admission to the hospital,<sup>10–13</sup> and, if left untreated, approximately two thirds of those patients will experience a further decline in their nutrition status during their hospitalization.<sup>13,14</sup> Malnutrition continues to be underdiagnosed in many hospitals,<sup>14–17</sup> and approximately one third of patients who are not malnourished on admission may become malnourished while hospitalized.<sup>18</sup> A recently published study of the prevalence of malnutrition among older patients presenting to an emergency department found that 16% were malnourished and that 60% were either malnourished or at risk for malnutrition.<sup>19</sup> Hospitalized patients, regardless of their BMI, typically suffer from undernutrition because of reduced nutrient intake due to illness-induced poor appetite, gastrointestinal

\* The Joint Commission's Provision of Care, Treatment, and Services Standard PC.01.02.01 states, “The hospital assesses and reassesses its patients.” Element of Performance (EP) 2 states, “The hospital defines, in writing, criteria that identify when additional, specialized, or more in-depth assessments are performed,” and EP 3 states, “The hospital has defined criteria that identify when nutritional plans are developed.” Joint Commission Standard PC.01.02.03 states, “The hospital assesses and reassesses the patient and his or her condition according to defined time frames. EP 7 states, “The hospital completes a nutritional screening (when warranted by the patient's needs or condition) within 24 hours after inpatient admission.”

symptoms, reduced ability to chew or swallow, or nil per os (NPO [nothing by mouth]) status for diagnostic and therapeutic procedures. In addition, they may have increased energy, protein, and essential micronutrient needs because of inflammation, infection, or other catabolic conditions.<sup>14</sup>

The need to identify at-risk patients is vital in that malnutrition is associated with an increased risk of pressure ulcers and impaired wound healing, immune suppression and higher infection rates, higher treatment costs, and increased mortality.<sup>10</sup> In an epidemiologic analysis of 887,189 major surgery cases drawn from the Healthcare Cost and Utilization Project (HCUP) Nationwide [National] Inpatient Sample (NIS), malnutrition was associated with an increased risk of severe events. Patients with malnutrition were 4 times more likely to develop pressure ulcers, 2 times more likely to develop surgical site infections, 16 times more likely to develop intravascular device infections, and 5 times more likely to develop catheter-associated urinary tract infections.<sup>20</sup> Malnutrition may also influence hospital readmission rates.<sup>21–23</sup> In the largest of these studies, a retrospective observational analysis of more than 10,000 consecutive admissions, Allaudeen et al. reported a 30-day readmission rate of 17%, and weight loss proved to be a significant comorbidity that increased the risk of readmission.<sup>21</sup> In a large single-center study of general surgery patients, the 30-day readmission rate was 11.3%, and the third most common reason for readmission was failure to thrive/malnutrition (10.4%).<sup>22</sup> These findings are consistent with the concept of malnutrition contributing to *posthospital syndrome*, which Krumholz described as “an acquired, transient period of vulnerability,”<sup>24(p. 100)</sup> which, together with other factors, can dramatically increase the risk of 30-day readmission.<sup>24</sup>

Furthermore, poor clinical outcomes associated with malnutrition contribute to higher hospitalization costs, as reflected in the longer length of stay (LOS) and increased readmissions associated with the higher rates of infections, pressure ulcers, impaired wound healing, and other adverse outcomes experienced by malnourished patients.<sup>8,16</sup> For example, Corkins et al. found that patients diagnosed with malnutrition had hospital costs and LOS three times higher than those without this diagnosis.<sup>17</sup>

### **Current State of Recognition, Diagnosis, and Coding of Patients with Malnutrition**

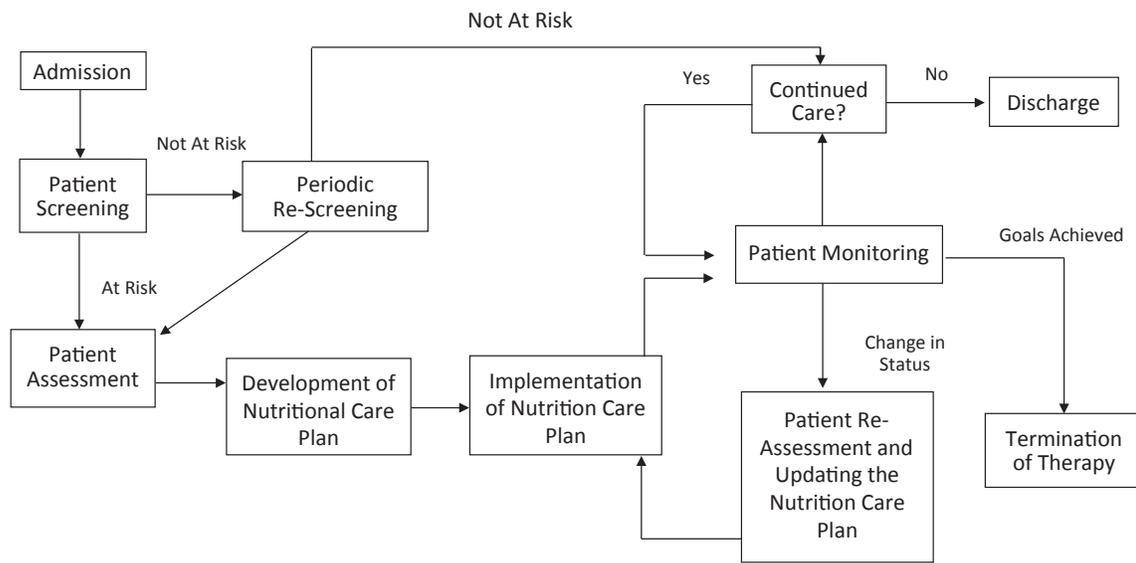
In 2012, according to the NIS, there were 36,484,846 hospital discharges in the United States, with an average LOS of 4.5 days, including 5,755,617 hospital discharges of pediatric patients (15.8%) and 12,704,704 hospital discharges of patients 65 years of age or older (34.8%).<sup>25</sup> Only 1,326,300 (3.6%) of

all these hospital discharges had a coded diagnosis of malnutrition, but 772,195 (58.2%) of them were in these vulnerable age categories.<sup>25</sup> This apparent undercoding (compared with earlier cited data on the incidence of malnutrition<sup>25</sup>), we believe, is due to underrecognition and underreporting, as well as underestimation of the importance of this comorbid condition on patient outcomes. In similar 2010 national data on 39,008,298 hospital discharges, the 1,248,680 (3.2%) of patients for whom malnutrition was coded tended to be 65 years of age or older, and have higher infection rates, longer LOS, higher costs, and higher rates of death.<sup>17</sup> According to the Agency for Healthcare Research and Quality (AHRQ), administration of enteral and parenteral nutrition was the 14th most frequent procedure in 2011, increasing in frequency by 85% from 1997, when it was not among the top 15 procedures.<sup>26</sup> The frequency of these therapies, which are given exclusively for the prevention or treatment of malnutrition, also suggest a greater incidence of malnutrition than indicated by the NIS malnutrition data. A low prevalence of malnutrition diagnosis is also present in some pediatric cross-sectional “snapshot” studies,<sup>27</sup> again supporting the disconnect between coding and intentional assessment of malnutrition.

### **Current State of Hospital Care Processes**

In a recently published report by Patel et al. of a survey of 1,777 hospital-based clinicians, whose identities were blinded, 50% of the respondents indicated that a nutrition screening was completed on admission, 37% of the respondents indicated that it was completed within 24 hours of admission, and most of the hospitals appeared to have a process to perform a nutrition assessment after the nutrition screening was completed.<sup>28</sup> However, there was considerable heterogeneity in both use of tools and mechanisms for the rest of the nutrition care steps. For example, only 23% of respondents reported using a validated nutrition assessment tool,<sup>28</sup> suggesting that screening compliance might not be done well or generate findings that can be compared between institutions. Also in the Patel et al. study, the most commonly reported barrier to completion of nutrition assessment was insufficient personnel (29.5%), with additional barriers including inadequate resources (7.7%), insufficient expertise (6.3%), and policies requiring an order from the prescriber (6.5%).<sup>28</sup> Although the study was limited by the fact that hospitals might have been represented by more than one respondent, these findings suggest that there are opportunities for hospitals and professional organizations to help mobilize the resources (staff, equipment, expertise) and offer education tailored to professionals involved in the nutrition screening and

## Nutrition Care Algorithm



**Figure 1.** Nutrition screening, assessment, and intervention in patients, which are illustrated in this nutrition care algorithm, are key components of nutrition care. Reprinted with permission from Mueller C, Compher C, Druyan ME; 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 (Reference 43, page 473).

assessment process. Use of validated, standardized screening and assessment tools can help drive consistency and interorganizational comparisons to help determine accurate prevalence of this problem.

### Impact of Nutrition Intervention on Outcomes

Nutrition intervention has been shown to improve clinical outcomes in many studies, most often in patients 65 years of age or older who are malnourished or at risk for developing malnutrition. These studies have shown that nutrition interventions significantly reduce complication rates, LOS and cost, readmission rates, and, in some studies, mortality.<sup>13,14,29–37</sup> Nutrition interventions include nutrition education and counseling; coordination of nutrition care; and nutrition delivery, which can range from provision of nutrient-dense food to enteral and parenteral nutrition.<sup>14</sup> There is growing evidence that nutrition intervention is an effective strategy for prevention of health care-acquired malnutrition and associated complications.<sup>38–40</sup>

### The Cost of Malnutrition

The cost of malnutrition was illustrated in two studies reporting health economic analyses of patients with disease-associated malnutrition.<sup>41,42</sup> In one study, the most costly complication associated with poor nutrition status was acute respiratory infection,

which adds up to an additional \$13,350 to \$19,530 per hospitalization.<sup>41</sup> The second study estimated the annual economic burden of disease-associated malnutrition be \$156.7 billion.<sup>42</sup>

### Addressing Malnutrition as a National Goal

Figure 1 (above) provides a nutrition care algorithm depicting the steps involved in the nutrition care of hospitalized patients.<sup>43</sup> As shown in the figure, screening on admission is only the first step of the nutrition care process; timely follow-up assessment and appropriate intervention without delay are imperative. With the average LOS at only 4.5 days,<sup>25</sup> the standards and systems of care need to drive the process such that a patient identified to be “at nutrition risk” or who is in fact malnourished receives an intervention(s) as rapidly as possible. In addition, nutrition must be addressed early in discharge planning so that it is identified in the transition from hospital to home or alternate care setting.

Malnutrition in hospitalized patients, particularly those with acute disease-related etiology such as very advanced or severe disease states, is at times inevitable. However, it should not simply result from a lack of attention from clinicians or a lack of hospital resources. It is not that malnutrition will be a “never event,” but the absence of timely nutrition assessment, diagnosis, and implementation of a care plan in patients at risk for malnutrition or with preexisting malnutrition should be a “never event.” As one indication of growing awareness of the impor-

**Sidebar 1. Additional Actions to Support Improvement in Nutrition Care Quality in Hospitals**

1. Each clinician should include nutrition as part of his or her daily patient care.
2. Use consistent definitions and validated nutrition screening and assessment tools so that all stakeholders are using consistent language. Assessment should include patient's weight and height measurements.
3. Develop a comprehensive nutrition plan for the transition of care settings, including a repeat nutrition screening completed just before discharge to assess if risk has elevated during the hospital stay and needs to be addressed in the discharge plan. Malnutrition will often require posthospital-discharge care.
4. Analyze hospital systems to determine what resources would be required to complete a nutrition assessment and have each patient who is malnourished or at nutritional risk have a plan of care implemented within 48 hours of admission.
5. Acceptable staffing levels should be evidence-based to provide sound nutrition care. Hospitals should employ nutrition care personnel such as registered dietitians and nutrition support clinicians at a standardized acuity level or bed-to-staff ratio to support Actions 1–3.\*
6. Hospitals should assess and enhance their electronic health record systems to allow for better organization of nutrition care parameters and interventions, and link this to diagnostic coding systems.
7. Hospitals should develop safety checklists for each patient to make sure clinicians are completing all the steps of nutrition screening, assessment, rescreening, and intervention using the algorithm of care above.
8. Use of restricted diets should be periodically evaluated.
9. Supportive mealtime environments should be built into care processes.
10. Hospitals should support development of dedicated teams for protocol development and management of enteral or parenteral nutrition as appropriate to facilitate timely initiation of the prescribed nutrition support therapy.
11. Institutions should develop a system to track nutrition care and its relation to outcome indicators.
12. Institutions should facilitate nutrition care across the health care transitions to provide continuity of therapy.

\* Nutrition support clinicians are dietitians, pharmacists, nurses, and physicians who are specialists in providing and managing nutrition support therapy in diverse patient populations, from pediatrics to geriatrics. They may work either independently or as part of a nutrition support team.

tance of malnutrition as a safety issue, malnutrition is one of the five patient safety risk areas represented in the 2015 Leapfrog Group Hospital Survey—the others being falls, pneumatic tourniquets, aspiration, and workforce fatigue.<sup>44</sup>

## Actions to Take

We now propose a series of specific actions that health care organizations should take to address prevention or treatment of acute or chronic disease-related malnutrition in hospitalized

patients to improve the quality of patient care, improve clinical outcomes, and reduce costs. The top three priority actions to take are as follows:

**1. Each Clinician on the Interdisciplinary Care Team Should Participate in the Execution of the Nutrition Care Plan.** Clinicians should create an institutional culture in which all stakeholders value clinical nutrition care,<sup>15</sup> and quality processes drive practice. Specific nutrition support teams can lead these efforts (such teams should include a physician, dietitian, nurse, and pharmacist, at a minimum).

**2. Develop Systems to Quickly Diagnose All Malnourished Patients and Those at Risk.** If malnutrition is present, it should be included as one of the patient's coded diagnoses.

**3. Develop Nutrition Care Plans in a Timely Fashion and Implement Comprehensive Nutrition Interventions (Optimally Within 48 Hours of Identification of the Malnourished Patient).**

Additional actions to be taken to supplement these three priorities can be found in Sidebar 1 (left). To help support these initiatives, consideration should be given to appropriate coding and reimbursement. As testimony to the importance of malnutrition to patient outcomes, the American Medical Association (Chicago) approved a resolution addressing malnutrition in hospitalized patients. The proceedings from the organization's 2014 annual meeting read as follows:

Resolved, That our American Medical Association recognizes the value of nutrition support teams services and their role in positive patient outcomes and supports payment for the provision of their services.<sup>45</sup>

Additional resources are required to optimally assess and intervene for malnourished and at-risk patients and therefore require additional reimbursement. Receiving allowable reimbursement for coded diagnoses and nutrition services could offset the cost of additional required resources while improving quality.

## Conclusion

Although disease-related malnutrition has generally not been treated as a “patient safety” issue, the impact and scope of this condition argues for its importance as a safety concern. Its recognition as a national goal should help mobilize health care organizations and other health care stakeholders in supporting the implementation of care processes for the nutrition care of hospitalized patients, which should, in turn, thereby improve outcomes, prevent readmissions, and reduce costs. **J**

This commentary, was prepared by the Malnutrition Committee of the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) [the authors] and approved by the A.S.P.E.N. Board of Directors.

**Peggi Guenter, PhD, RN, FAAN**, is Senior Director of Clinical Practice, Quality, and Advocacy, American Society for Parenteral and Enteral Nutrition, Silver Spring, Maryland. **Gordon Jensen, MD, PhD, FASPEN**, is Professor and Head, Nutritional Sciences, and Professor of Medicine, Pennsylvania State University, University Park. **Vihass Patel, MD, FACS, CNSC**, formerly Director, Metabolic Support Service, Brigham and Women's Hospital, Boston, is Director, Acute Care Surgery, Long Island Jewish Medical Center, New Hyde Park, New York. **Sarah Miller, PharmD, BCNSP**, is Professor of Pharmacy Practice, University of Montana Skaggs School of Pharmacy, Missoula. **Kris M. Mogensen, MS, RD, LDN, CNSC**, is Team Leader Dietitian, Department of Nutrition, Brigham and Women's Hospital, Boston. **Ainsley Malone, MS, RD, CNSC, FAND**, is Nutrition Support Dietitian, Pharmacy Department, Mount Carmel West Hospital, Columbus, Ohio. **Mark Corkins, MD, SPR, CNSC, FAAP**, is Division Chief, Pediatric Gastroenterology, and Professor of Pediatrics, Le Bonheur Children's Hospital/University of Tennessee Health Sciences Center, Memphis. **Cindy Hamilton, MS, RD**, is Director Nutrition, Digestive Disease Institute, Center for Human Nutrition, Cleveland Clinic. **Rose Ann DiMaria-Ghalili, PhD, RN, CNSC, FASPEN**, is Associate Professor, College of Nursing and Health Professions, Drexel University, Philadelphia. Please address correspondence to Peggi Guenter, [peggig@nutritioncare.org](mailto:peggig@nutritioncare.org).

## References

- American Society of Parenteral and Enteral Nutrition (A.S.P.E.N.) About A.S.P.E.N. Accessed Aug 28, 2015. <https://www.nutritioncare.org/about-aspen/>.
- Special Communication: A statement by the ASPEN Board of Directors. *JPEN J Parenter Enteral Nutr.* 1983;7(3):219–220.
- American Society for Nutrition. About ASN. Accessed Aug 28, 2015. <http://www.nutrition.org/about-asn/>.
- Academy of Nutrition and Dietetics. Eatright®. Home page. Accessed Aug 28, 2015. <http://www.eatright.org/>.
- Dougherty D, et al. Nutrition care given new importance in JCAHO standards. *Nutr Clin Pract.* 1995;10(1):26–31.
- The Joint Commission. *2015 Comprehensive Accreditation Manual for Hospitals*. Oak Brook, IL: Joint Commission Resources, 2014.
- Jensen GL, Hsiao PY. Obesity in older adults: Relationship to functional limitation. *Curr Opin Clin Nutr Metab Care.* 2010;13(1):46–51.
- Jensen GL, et al. Adult starvation and disease-related malnutrition: A proposal for etiology-based diagnosis in the clinical practice setting from the International Consensus Guideline Committee. *JPEN J Parenter Enteral Nutr.* 2010;34(2):156–159.
- White JV, 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.
- Barker LA, Gout BS, Crowe TC. Hospital malnutrition: Prevalence, identification and impact on patients and the healthcare system. *Int J Environ Res Public Health.* 2011;8(2):514–527.
- Bistrian BR, et al. Protein status of general surgical patients. *JAMA.* 1974 Nov 11;230(6):858–860.
- Christensen KS, Gstundtner KM. Hospital-wide screening improves basis for nutrition intervention. *J Am Diet Assoc.* 1985;85(6):704–706.
- Somanchi M, Tao X, Mullin GE. The facilitated early enteral and dietary management effectiveness trial in hospitalized patients with malnutrition. *JPEN J Parenter Enteral Nutr.* 2011;35(2):209–216.
- Tappenden KA, et al. Critical role of nutrition in improving quality of care: An interdisciplinary call to action to address adult hospital malnutrition. *JPEN J Parenter Enteral Nutr.* 2013;37(4):482–497.
- Kirkland LL, et al. Nutrition in the hospitalized patient. *J Hosp Med.* 2013; 8(1):52–58.
- Singh H, et al. Malnutrition is prevalent in hospitalized medical patients: Are housestaff identifying the malnourished patient? *Nutrition.* 2006;22(4):350–354.
- Corkins MR, et al. Malnutrition diagnoses in hospitalized patients: United States, 2010. *JPEN J Parenter Enteral Nutr.* 2014;38(2):186–195.
- Braunschweig C, Gomez S, Sheean PM. Impact of declines in nutritional status on outcomes in adult patients hospitalized for more than 7 days. *J Am Diet Assoc.* 2000;100(11):1316–1322; quiz 1323–1324.
- Pereira GF, et al. Malnutrition among cognitively intact, noncritically ill older adults in the emergency department. *Ann Emerg Med.* 2015;65(1):85–91.
- Fry DE, et al. Patient characteristics and the occurrence of never events. *Arch Surg.* 2010;145(2):148–151.
- Allaudeen N, et al. Redefining readmission risk factors for general medicine patients. *J Hosp Med.* 2011;6(2):54–60.
- Kassin MT, et al. Risk factors for 30-day hospital readmission among general surgery patients. *J Am Coll Surg.* 2012;215(3):322–330.
- Mudge AM, et al. Recurrent readmissions in medical patients: A prospective study. *J Hosp Med.* 2011;6(2):61–67.
- Krumholz HM. Post-hospital syndrome—An acquired, transient condition of generalized risk. *N Engl J Med.* 2013 Jan 10;368(2):100–102.
- Agency for Healthcare Research and Quality. Welcome to H•CUPnet. Accessed Aug 28, 2015. <http://www.hcupnet.ahrq.gov>.
- Agency for Healthcare Research and Quality. HCUP Statistical Brief #165. Most Frequent Procedures Performed in U.S. Hospitals, 2011. Pfuntner A, Wier LM, Stocks C. Oct 2013. Accessed Aug 28, 2015. <http://hcup-us.ahrq.gov/reports/statbriefs/sb165.pdf>.
- Joosten KE, Hulst JM. Prevalence of malnutrition in pediatric hospital patients. *Curr Opin Pediatr.* 2008;20(5):590–596.
- Patel V, et al. Nutrition screening and assessment in hospitalized patients: A survey of current practice in the United States. *Nutr Clin Pract.* 2014;29(4):483–490.
- Avenell A, Handoll HH. Nutritional supplementation for hip fracture after care in older people. *Cochrane Database Syst Rev.* 2010 Jan 20;(1):CD001880.
- Milne AC, et al. Protein and energy supplementation in elderly people at risk from malnutrition. *Cochrane Database Syst Rev.* 2009 Apr 15;(2):CD003288.
- Stratton RJ, et al. Enteral nutritional support in prevention and treatment of pressure ulcers: A systematic review and meta-analysis. *Ageing Res Rev.* 2005;4(3): 422–450.
- Brugler L, DiPrinzio MJ, Bernstein L. The five-year evolution of a malnutrition treatment program in a community hospital. *Jt Comm J Qual Improv.* 1999; 25(4):191–206.
- Cawood AL, Elia M, Stratton RJ. Systematic review and meta-analysis of the effects of high protein oral nutritional supplements. *Ageing Res Rev.* 2012;11(2): 278–296.
- Gariballa S, et al. A randomized, double-blind, placebo-controlled trial of nutritional supplementation during acute illness. *Am J Med.* 2006;119(8):693–699.
- Milne AC, Avenell A, Potter J. Meta-analysis: Protein and energy supplementation in older people. *Ann Intern Med.* 2006 Jan 3;144(1):37–48. Erratum in: *Ann Intern Med.* 2006 Apr 4;144(7):538.
- Neelemaat F, et al. Short-term oral nutritional intervention with protein and vitamin D decreases falls in malnourished older adults. *J Am Geriatr Soc.* 2012;60(4): 691–699.
- Philipson TJ, et al. Impact of oral nutritional supplementation on hospital outcomes. *Am J Manag Care.* 2013;19(2):121–128.
- Rosen BS, Maddox PJ, Ray N. A position paper on how cost and quality reforms are changing healthcare in America: Focus on nutrition. *JPEN J Parenter Enteral Nutr.* 2013;37(6):796–801.
- Starke J, et al. Short-term individual nutritional care as part of routine clinical setting improves outcome and quality of life in malnourished medical patients. *Clin Nutr.* 2011;30(2):194–201.
- Gibbons W, et al. Eliminating facility-acquired pressure ulcers at Ascension Health. *Jt Comm J Qual Patient Saf.* 2006;32(9):488–496.
- Cangelosi MJ, et al. Evaluation of the economic burden of diseases associated with poor nutrition status. *JPEN J Parenter Enteral Nutr.* 2014;38(S2):35S–41S.
- Snider JT, et al. Economic burden of community-based disease-associated malnutrition in the United States. *JPEN J Parenter Enteral Nutr.* 2014;38(S2):77S–85S.
- Mueller C, Compher C, Druyan ME; 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.
- The Leapfrog Group. Leapfrog Hospital Survey Hard Copy: Questions & Reporting Periods, Endnotes, Measure Specifications, FAQs. Aug 2015. Accessed Aug 28, 2015. <https://leapfroghospitalssurvey.org/web/wp-content/uploads/survey.pdf>.
- American Medical Association. Proceedings of the 2014 Annual Meeting of the House of Delegates: Resolution 705 Payment for Nutrition Support Services. Approved resolution June 9–10, 2014. Now policy H-150.931. Accessed Aug 28, 2015. <http://www.ama-assn.org/ama/pub/about-ama/our-people/house-delegates/meeting-archives/2014-annual-meeting.page>.