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MEASURING MALNUTRITION AND FOOD INSECURITY TO FACILITATE QUALITY CARE AND HEALTH EQUITY
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FROM THE ACADEMY

S7 INTRODUCTION
Impacting Malnutrition, Food Insecurity, and Health Equity: An Overview of Academy of Nutrition and Dietetics Priorities and Future Opportunities
Dana Buelsing Sowards, MS, CAPM; Sharon M. McCauley, MS, MBA, RDN, LDN, FADA, FAND; Nancy Munoz, DCN, MHA, RDN, FAND, LDN

S12 PUBLIC POLICY NEWS
Nutrition Security at the Intersection of Health Equity and Quality Care
Jeanne Blankenship, MS, RDN; Robert B. Blancato, MPA

PRACTICE APPLICATIONS

S21 PROFESSIONAL PRACTICE
Advancing Health Equity through Malnutrition Quality Measurement Roundtable: Practice Applications
Christina Badaracco, MPH, RDN, LDN; Michelle Bruno, MPP; Kristi Mitchell, MPH; Sharon McCauley, MS, MBA, RDN, LDN, FADA, FAND

S28 PROFESSIONAL PRACTICE
The Role of Inpatient Malnutrition Care to Address Health Disparities among Older Adults
Naila Wahid, MHA; Christina Badaracco, MPH, RDN, LDN; Angel F. Valladares, MPH; Ashley Depriest, MS, RDN; Alyssa Collins, MS, RD, LDN; Kristi Mitchell, MPH

S34 PROFESSIONAL PRACTICE
Malnutrition Quality Improvement Initiative Data Support Continued Opportunities in Malnutrition Care
Michelle Bruno, MPP; Kirk Kerr, PhD; Christina Badaracco, MPH, RDN, LDN; Taylor Musser, MPH; Karl M. Kilgore, PhD

S42 PROFESSIONAL PRACTICE
Reprint of: Development and Evaluation of a Global Malnutrition Composite Score
Angel F. Valladares, MPH; Sharon M. McCauley, MS, MBA, RDN, LDN, FADA, FAND; Mujahed Khan, MBA, RDN, LDN, FAND; Catherine D’Andrea, RDN, LDN; Karl Kilgore, PhD; Kristi Mitchell, MPH
FROM THE ACADEMY

S50 POSITION PAPER
Reprint of: Position of the Academy of Nutrition and Dietetics: Malnutrition (Undernutrition) Screening Tools for All Adults
Annalynn Skipper, PhD, RD; Anne Coltman, MS, RD, LDN, CNSC; Jennifer Tomesko, DCN, RD, CNSC;
Pamela Charney, PhD, RD; Judith Porcari, MBA, MS, RD; Tami A. Piemonte, MS, RDN, LD/N;
Deepa Handu, PhD, RD, LDN; Feon W. Cheng, PhD, MPH, RDN, CHTS-CP

S55 POSITION PAPER
Reprint of: Position of the Academy of Nutrition and Dietetics: Food Insecurity in the United States
David H. Holben, PhD, RDN, LD, FAND; Michelle Berger Marshall, MS, RDN

S67 ETHICS IN PRACTICE
Reprint of: Social Determinants of Health: Enhancing Health Equity
Tony Peregrin

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Advancing Health Equity through Malnutrition Quality Measurement Roundtable: Practice Applications

Christina Badaracco, MPH, RDN, LDN; Michelle Bruno, MPP; Kristi Mitchell, MPH; Sharon McCauley, MS, MBA, RDN, LDN, FADA, FAND

HEALTH CARE STAKEHOLDERS and policymakers across the United States are increasingly focused on addressing nutrition security (see Key Terms below) as a means of improving health and advancing equity. Indeed, a 2021 perspective in the Journal of the American Medical Association argued that “addressing nutrition security...may be the next needed approach to inform clinical care and public policy”1 and a 2022 article in the American Journal of Lifestyle Medicine argued that addressing the related issue of food insecurity is necessary for achieving optimal nutrition status.2

The Biden Administration has indicated it intends to do this through multiple avenues, including: the 2020–2030 Strategic Plan for National Institutes of Health Nutrition Research3; the White House Conference on Hunger, Nutrition, and Health4; formation of the National Institutes of Health Nutrition and Health Disparities Implementation Working Group and its research framework5; and the multiyear, $10 billion investment to ensure food and nutrition security both in the United States and abroad.6 The Centers for Medicare and Medicaid Services (CMS) has incorporated a new Payment Activity (IA) focused on addressing food insecurity and nutrition risk into the Merit-Based Incentive Payment System (MIPS) (for which registered dietitian nutritionists [RDNs] can be eligible providers),7 Whereas all show promise of increased attention on the important role of nutrition in promoting health and the investment to improve it, it remains to be seen how these plans will influence larger payment programs or drive broad improvement in clinical practice addressing malnutrition.

Avalere Health, the Academy of Nutrition and Dietetics, and the National Minority Quality Forum took the lead in addressing these issues by cohosting a Roundtable on March 3, 2022, to identify innovative and successful examples of solutions being implemented in various sectors, many involving RDNs leading the interdisciplinary care teams that address malnutrition and food insecurity. This article presents an overview of the Roundtable, results of the discussion, and implications for RDNs. Full results of the Roundtable discussion are available in the published proceedings.8

BACKGROUND

Malnutrition and food insecurity are interconnected conditions that impair health, worsen outcomes, and exacerbate chronic health concerns for patients and the public and burden our health care system. These are two frequent issues of concern to RDNs working in various settings. Although they are gaining increasing attention from other clinicians and health care stakeholder groups, the growing burden of malnutrition and food insecurity indicates a need for greater attention and indeed prioritization for both prevention and management across the United States. Existing disparities in prevalence of these conditions, related health outcomes, and access to appropriate care across population groups were also intensified by the COVID-19 pandemic.

Malnutrition in the acute care setting likely ranges from 20% to 50%, but only 9% of cases are actually diagnosed.5,9,10 In addition, 10.5% of households experienced food insecurity (or uncertain access to adequate food) in 2020.11 Food insecurity is a social risk factor that contributes to malnutrition when it impairs a person’s ability to eat enough nutrient-dense foods and maintain muscle mass, and both states can be exacerbated by underlying medical conditions.12 Therefore, many patients who present with malnutrition in clinical settings may also be food insecure.

The percentage of Americans with multiple lifestyle-related conditions (i.e., those largely driven by poor diet) continues to increase and the proportion of older adults with poor diet quality significantly increased from 51% to 61% since 2001.13,14 Collectively, these statistics suggest the need for improvement in access to and utilization of quality nutrition care and healthy food to improve Americans’ physical, mental, and social well-being.

Malnutrition and food insecurity would ideally be identified in tandem in clinical care settings by RDNs or their interdisciplinary team members. Although this identification can occur in various settings of care, doing so in an evidence-based manner in the hospital and with interdisciplinary collaboration can offer a consistent and standardized system for identifying and treating patients at risk. Improved identification of malnutrition and food insecurity risk factors in hospitals and other health care institutions can inform more effective and timely interventions both within clinical settings and through community-based partners. Although hospital-based efforts to address these issues exist, they
are typically implemented on a local level, often limiting widespread sharing of best practices. Documented diagnoses also remain far less than the known prevalence, as stated previously. More support for the expanded adoption of viable solutions for improving malnutrition care and addressing food insecurity is therefore needed and these gaps provided the basis for the Roundtable.

UNDERSTANDING KEY TERMS
Health equity refers to the state in which all individuals have the opportunity to achieve their full health potential, whereas health disparities are differences in health outcomes or access to care among individuals that are often preventable and stem from inequities. Understanding these definitions is important because they are often confused or used interchangeably. Additional definitions of key factors related to malnutrition and food insecurity are provided in the box below.2,15–19

Although RDNs are aware of the difference between malnutrition and food insecurity, these terms are often conflated by those less familiar with nutrition. They are related and often coexisting issues, but they are distinct. Similarly, the state of food security does not necessarily imply nutrition security; someone can have adequate access to and availability of food without it being nutritious and health-promoting. Indeed, the latter far too often drives malnutrition via the overconsumption of calories and unhealthy foods amidst underconsumption of key nutrients that people need to be resilient and thrive.

ROUND TABLE OVERVIEW
To support the adoption of viable solutions for improving malnutrition care and addressing food insecurity beginning in the hospital, a group of national experts and stakeholders convened for a 3-hour virtual Roundtable on March 3, 2022. Recognizing that a multidisciplinary and multisector set of solutions is needed to meet the needs of communities across the country, a diverse set of 23 participants representing local, regional, and national organizations and agencies in both health care and community health were invited to share their expertise and ideas and to align on priority solutions. Participants represented groups, including:

- Advocacy organizations
- Community food and nutrition organizations
- Federal government
- Foodservice organizations
- Health care providers
- Health plans
- Professional organizations
- Research/academia

The Roundtable sought to achieve three objectives:

- increase awareness of the connections between health equity, hospital malnutrition care, and food insecurity, and identify the most effective ways to communicate those connections to inspire action;
- identify opportunities that hospitals can pursue to target and address malnutrition and food insecurity through malnutrition quality measurement; and
- determine pathways that manage and address malnutrition, food insecurity, and health disparities across transitions of care.

To begin the conversation, participants were presented with Figure 1, which illustrates an optimal pathway for addressing nutrition and food insecurity risk from a community perspective. The pathway centers around the use of the Global Malnutrition Composite Score (GMCS)—an electronic clinical quality measure developed by Avalere Health and stewarded by the Academy of Nutrition and Dietetics for use in the inpatient setting20—and it accounts for the nutrition and food insecurity risk factors that are known to contribute to health disparities. Quality measurement is an important tool in health care that enables providers to measure or quantify and track improvement in health care processes, outcomes, and other aspects of care. Initiating quality measurement in acute care settings through use of the GMCS can serve as an anchor for health care providers to create opportunities for food insecurity to be more effectively identified, addressed, and monitored after patients are discharged.

Indeed, systematically identifying and addressing nutrition and food insecurity risk factors in the hospital that lead to clinical malnutrition can advance health equity for higher-risk communities facing significant health disparities along this continuum. The next portion of the Roundtable included case study presentations by two long-time members of the Malnutrition Quality Improvement Initiative (MQii) Learning Collaborative. The MQii is a multiyear effort that seeks to advance evidence-based, high-quality, patient-driven care for hospitalized adults who are malnourished or at risk for malnutrition through use of a comprehensive toolkit; four accompanying malnutrition-focused electronic clinical quality measures,21 which provided a baseline for the framework of the GMCS components; and support for a 315+-member

Key Terms

- **Health Equity**: The state in which all individuals have the opportunity to achieve their full health potential
- **Health Disparities**: Preventable differences among individuals and communities, usually in disease burden, access to care, and outcomes
- **Social Determinants**: The conditions in which individuals are born, grow, work, live, and age, including economic, political, and social policies/systems
- **Social Risks**: The adverse social conditions (eg, food insecurity) associated with poor health outcomes
- **Malnutrition**: The state of nutrient imbalance; includes both undernutrition and overnutrition
- **Food Insecurity**: The economic and social condition of limited or uncertain access to adequate food
- **Nutrition Security**: The condition in which all Americans have consistent access to the safe, healthy, affordable foods essential to optimal health and well-being
Learning Collaborative of health care institutions across the country. Teams from Learning Collaborative members New Hanover Regional Medical Center (New Hanover) and Memorial Hermann Health System (Memorial Hermann) presented their quality improvement initiatives seeking to address malnutrition and food insecurity while closing gaps in care for their patient populations. They also discussed how those initiatives aligned with overarching hospital or system values and goals.

New Hanover’s Transitions of Care program, depicted in Figure 2, has been presented in previous publications. The hospital’s chief medical officer, clinical nutrition manager, and clinical outreach dietitian described how awareness of the problem of malnutrition in their patient population led them to develop this program, with a clinical outreach dietitian performing in-home visits with patients (in and around Wilmington, NC) who were identified as malnourished during their hospital stays. Patients also identified as food insecure received a box of food upon discharge (in addition to the RDN in-home visit). This program has remained a key component of the hospital’s strategy to achieve health equity in its community; it has also led to a reduction in hospital readmissions, average length of stay, and other key metrics for its malnourished population. And, it highlights the key role of RDNs—including those in unconventional or innovative roles—in improving patient outcomes and leading quality improvement initiatives.

Figure 1. Optimal pathway for nutrition care that reflects both food insecurity and nutrition risk identification and intervention across the continuum of care.

Figure 2. Overview of New Hanover’s Transitions of Care Program to support patients identified as malnourished and food insecure.
The Memorial Hermann team, which consisted of the clinical nutrition manager, director of clinical nutrition, and director of hospital operations for the system’s Transformation Hub, presented their strategy to address food insecurity and malnutrition across Southeast Texas. They described a case study of a patient experiencing both conditions and burdened by other social risk factors. With adequate and appropriate care, the patient was able to improve his nutritional status and overall health. This was in part due to the comprehensive referral and resource platform offered by the system’s Community Resource Centers (CRCs) (see Figure 3). The CRC model has been described previously and the early inspiration for this model has been presented in other publications.

They also described findings from a study on food insecurity prevalence among their community-dwelling disabled patients and a recent study on the influence of malnutrition on clinical outcomes across the system, which helped the system better understand the burden on patients and their health care system. In addition, the team reviewed goals to increase the effectiveness of their CRCs through strategies such as addressing patients’ barriers to accessing resources and further integrating nutrition services into these CRCs, which are staffed primarily by community health workers. This example highlighted the important and sequential steps of measuring prevalence of malnutrition and food insecurity, understanding available resources and patients’ access to those resources, and collaborating across disciplines to develop solutions based in the hospital that reflect needs of the local population. It also highlights why it is advisable to track both process and outcome measures over time.

The final portion of the Roundtable was a facilitated discussion that focused on three topics:

- measurement of malnutrition in the hospital to inform effective solutions in the community;
- overcoming barriers in hospital settings to connect hospitals to community organizations that provide access to food resources; and
- policy and education initiatives that can raise awareness of these issues and feasible interventions to connect patients to resources.

Throughout the discussion, participants suggested solutions to help advance health equity by addressing malnutrition and food insecurity; these were based on their professional experiences and informed by what they learned during the Roundtable. Most participants agreed on the benefits of following a structured care process and tracking performance based on standardized measures—which would serve as a key step to begin, and then underpin, most other strategies. Many of the solutions offered, therefore, represent programs, processes, and other key tactics that have been successful in certain settings and could be implemented more broadly across health care and/or community health settings. When asked to prioritize the entire list of suggested solutions, Roundtable participants identified the items presented in Figure 4.

Additional comments on these solutions suggested promoting nutrition beginning with children in primary education to instill knowledge and healthy behaviors beginning at a young age, looking to expertise from community organizations when addressing food insecurity, ensuring food insecurity interventions are part of a broader strategy to address social risk factors, and prioritizing early screening for malnutrition and food insecurity with validated tools in both hospital and ambulatory settings. Importantly, many of the solutions focusing on the role of RDNs were offered by non-RDN participants.

### NEXT STEPS AND ACTIONABLE SOLUTIONS FOR RDNs AND PARTNERS

Although all solutions presented above clearly have implications for RDNs working in various settings, some have more immediately actionable steps by those taking leadership roles in research and quality improvement in their respective practice settings. Applications for RDNs working in various practice settings are presented below.
Clinical Settings
Findings from the 2021 Academy of Nutrition and Dietetics’ Compensation and Benefits Survey indicated that 39% of practicing RDNs work in acute care. In hospitals, RDNs play a key role in identifying malnutrition and food insecurity; documenting pertinent signs and symptoms to support diagnoses; developing and implementing nutrition care plans, including appropriate and evidence-based interventions; educating other providers about nutrition; addressing food- and nutrition-related needs in discharge plans; and following up after discharge (when possible). They can independently collect data and track performance on the four malnutrition electronic clinical quality measures (as MQii Learning Collaborative members have been doing for many years) as well as the GMCS. CMS has adopted the GMCS into the Hospital Inpatient Quality Reporting program and will be available for hospitals to adopt and report to CMS in 2024 to inform appropriate Medicare reimbursement for the necessary care provided. This data collection can generate evidence to show improvements identifying and documenting presence of malnutrition, clinical outcomes, and care utilization resulting from such initiatives. As another solution prioritized by Roundtable participants, publishing and disseminating results can share knowledge with other practitioners, expand the evidence base for existing disparities related to food access and intake as well as nutritional status, and track improvement over time.

Care coordination and data collection are equally important in outpatient and skilled and long-term care settings. However, the appropriate tools and incentive programs to do so differ. Another tool that RDNs and other clinicians can use in outpatient settings to support these processes is the new MIPS IA focused on nutrition and food insecurity risk identification and treatment, which became available for reporting by MIPS-eligible providers (including RDNs) in 2022. This IA gives providers the flexibility to implement quality improvement efforts and clinical activities that improve clinical practice, care delivery, and outcomes specific to these issues and are one component used to help calculate their Medicare reimbursement. For RDNs, this could include referring patients to appropriate community programs or providing services such as food prescriptions and healthy cooking classes to patients. By assigning the IA to the Achieving Health Equity subcategory, CMS also acknowledged the importance of identifying food insecurity and nutrition risk and then intervening to improve these interrelated issues among patients with the highest risk.

Community Settings
Ten percent of RDNs work in community and public health nutrition, providing education, counseling, and other food- and nutrition-related services to improve food access and dietary quality among community-dwelling adults and families.
services frequently target individuals at greatest risk of poor health outcomes and most vulnerable to social risk factors such as unemployment, homelessness, and lack of transportation. The work of RDNs in these settings may involve implementing public programs or developing new and innovative models to meet their communities’ unique needs. They also often collect data to evaluate the effectiveness of such programs for justification to funding organizations (including government agencies). RDNs working in community settings could benefit from better linkages to clinical settings to ensure clear lines of communication, referral pathways, and data sharing, ultimately leading to improved outcomes.

Advocacy and Policy

RDNs working across settings can—and are encouraged to—engage in advocacy and both learn about and inform policy changes to ensure patients and the public have access to quality nutrition care as well as food resources to achieve their best health. Advocacy opportunities can include the Academy of Nutrition and Dietetics annual Advocacy Summit; state affiliate public policy activities and licensure initiatives; engagement with Dietetic Practice Groups and Affinity Groups; writing blogs and commentaries about key pieces of legislation; submitting comments on CMS rules, research by the Agency for Healthcare Research and Quality, and recommendations and research plans by the US Preventive Services Task Force; and educating students and interns. These actions all provide ways to share knowledge, expand practice opportunities, and push for a healthier and more equitable food system. Current areas of advocacy pertinent to malnutrition, food insecurity, and health equity; insights shared by Roundtable participants with diverse expertise on necessary steps to improve policy and clinical practice to address these issues; and suggestions about how RDNs can take a leadership role in moving many of those changes forward. The continued need to follow evidence-based practice, collect data on process outcomes that indicate malnutrition identification and documentation as well as patient outcomes, and conduct quality improvement efforts will also further help improve care for patients and close gaps in care to better achieve equity. Collecting such data and comparing to standard quality measures in clinical settings can reveal gaps and target areas for intervening to address malnutrition and/or food insecurity for patients with highest risk and need.

CONCLUSIONS

This article presents an overview of the connections between malnutrition, food insecurity, and health equity; insights shared by Roundtable participants with diverse expertise on necessary steps to improve policy and clinical practice to address these issues; and suggestions about how RDNs can take a leadership role in moving many of those changes forward. The continued need to follow evidence-based practice, collect data on process outcomes that indicate malnutrition identification and documentation as well as patient outcomes, and conduct quality improvement efforts will also further help improve care for patients and close gaps in care to better achieve equity. Collecting such data and comparing to standard quality measures in clinical settings can reveal gaps and target areas for intervening to address malnutrition and/or food insecurity for patients with highest risk and need.

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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

The Malnutrition Quality Improvement Initiative is a project of the Academy of Nutrition and Dietetics, Avalere Health, and other stakeholders who participated in and provided guidance and expertise in this collaborative partnership. S. M. McCauley is an employee of the Academy of Nutrition and Dietetics. C. Badaracco, M. Bruno, and K. Mitchell are employees of Avalere Health.

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AUTHOR CONTRIBUTIONS

All coauthors planned and implemented the Roundtable. K. Mitchell conducted pre-Roundtable interviews and C. Badaracco administered the post-Roundtable survey. C. Badaracco drafted the manuscript. All coauthors reviewed and commented on subsequent drafts of the manuscript.
Impacting Malnutrition, Food Insecurity, and Health Equity: An Overview of Academy of Nutrition and Dietetics Priorities and Future Opportunities

Dana Buelsing Sowards, MS, CAPM; Sharon M. McCauley, MS, MBA, RDN, LDN, FADA, FAND; Nancy Munoz, DCN, MHA, RDN, FAND, LDN

A N INHERENT CONNECTION exists between malnutrition, food insecurity, and health equity. Registered dietitian nutritionists (RDNs) are at the forefront of addressing these to impact better health outcomes for the overall population in various practice settings (eg, hospital, post-acute and long-term care, community). Identifying malnutrition helps flag those who are food insecure and conversely, identifying food insecurity may suggest the presence or risk of malnutrition.1 The Academy of Nutrition and Dietetics (Academy) supports RDNs and nutrition and dietetic technicians, registered (NDTRs) by developing and providing tools, resources, and initiatives related to malnutrition, food insecurity, and health equity. Such resources include the use of valid and reliable screening tools that trigger referrals to an RDN2 for nutrition assessment, care planning, and treatment interventions for patients in acute care, ambulatory, post-acute, and community-based points of care diagnosed as at nutrition risk, malnourished, and food insecure.

MALNUTRITION AND FOOD INSECURITY

Older adults age 65 years and older are at an increased risk for malnutrition because of factors such as physical changes, isolation, depression, and limited income.3 The prevalence of malnutrition in American older adults who reside in the community setting ranges from 1% to 25%; in the long-term care setting, in which approximately 4% of older adults reside, it is closer to 66.5%.3 Malnutrition (undernutrition) contributes to increased morbidity and mortality, lower quality of life, and increased hospital length of stay and health care costs.4 Food insecurity caused by economic burden increases the risk of malnutrition.5,6 Malnutrition is not distributed equally, and disproportionately burdens vulnerable populations.7 Data from the Malnutrition Quality Improvement Initiative (MQii) Learning Collaborative in 2019 indicate non-Hispanic Black individuals with malnutrition have more than a 26% readmission rate compared with less than 19% among non-Hispanic White individuals1 (see Figure 1). Addressing malnutrition through the implementation of quality measures that include a nutrition care plan provided by an RDN can help reduce disparities in accessing healthy food and health care.1

ACADEMY STRATEGIC PLAN AND CODE OF ETHICS

To support the work of its members and to help all credentialed nutrition and dietetics practitioners ensure equitable access to nutrition services for all patients and the public, the Academy has demonstrated its dedication to addressing malnutrition, food insecurity, and health equity by incorporating them into its strategic plan.3 Figure 2 outlines the principle, focus areas, and impact goals that include these three issues.

In addition to the Academy’s strategic plan, the 2018 Academy/Commission on Dietetic Registration (CDR) Code of Ethics for the Nutrition and Dietetics Profession10 also promotes health equity in its principles and standards, including:

- 1 g. Act in a caring and respectful manner, mindful of individual differences, cultural, and ethnic diversity;
- 4 a. Collaborate with others to reduce health disparities and protect human rights; and
- 4 b. Promote fairness and objectivity with fair and equitable treatment.

The Code of Ethics reflects the values and ethical principles guiding the nutrition and dietetics profession and is intended to set forth commitments and obligations of Academy members and CDR credentialed nutrition and dietetics practitioners to the public, clients, the profession, colleagues, and other professionals. To support the Code of Ethics, the Academy releases Ethics in Practice articles in the Journal of the Academy of Nutrition and Dietetics (Journal). The Ethics in Practice article “Social Determinants of Health: Enhancing Health Equity”11 focuses on how the Academy recognizes the role of social determinants of health12 when examining root causes of chronic diseases and
provides recommendations for addressing health disparities tied specifically to social determinants of health.

**ACADEMY INITIATIVES, PROJECTS, AND RESOURCES**

**Malnutrition Quality Improvement Initiative**

The MQii is a national nutrition focused quality improvement initiative. The MQii is a collaborative initiative between the Academy, Avalere Health and other stakeholders spanning from 2013 to the present. The MQii focuses on improving care and outcomes for hospitalized adults aged 65 years and older by providing a series of nutrition-focused resources that include the Global Malnutrition Composite Score (GMCS) electronic clinical quality measure (eCQM), national Learning Collaborative (includes opportunities for peer collaboration, research, and dissemination support), and an interdisciplinary toolkit. The MQii is forward focusing and seeks to extend applications to patient care and outcomes in other populations and care settings.13

A set of four malnutrition-focused eCQMs were developed through a process of identifying gaps in malnutrition care.14 As the measures were tested by members of a Learning Collaborative, and evaluated by national bodies such as the National Quality Forum (NQF) and Centers for Medicare & Medicaid Services (CMS), CMS and NQF suggested combining the four eCQMs into a composite measure—resulting in the GMCS eCQM. CMS defines a composite measure as a performance measure representing a "combination of two or more component measures, each of which individually reflects quality care, into a single performance measure with a single score." As the four eCQMs are independent, the components are interrelated moving process to outcomes, the composite measure offers more comprehensive follow-through on best practices for patients at risk of malnutrition. The four components of the GMCS follow the nutrition care process and include:

1. Screening for malnutrition risk at admission;
2. Completion of a nutrition assessment for patients who screened positively for risk of malnutrition;
3. Appropriate documentation of malnutrition diagnosis in the patient’s medical record when this is indicated by the assessment findings; and
4. Development of a nutrition care plan (including the recommended treatment) for malnourished patients.15

This process begins with identification of risk of malnutrition for a more thorough assessment by an RDN. The RDN then works with the appropriate interdisciplinary team members in providing treatment recommendations to address the nutritional status and clinical indicators that inform a medical diagnosis of malnutrition documented by a physician.

The GMCS measure was included in the CMS 2020 Measures Under Consideration (MUC) List,16 published December 2020, as MUC20-0032. More recently, the GMCS measure was unanimously endorsed by NQF’s Consensus Standards Approval Committee in June 2021.17 Endorsement indicates a measure is “best in class” and brings the measure one step closer to CMS program adoption.18 The GMCS measure was included in the CMS Inpatient Prospective Payment Systems (IPPS) Final Rule for acute-care and long-term care hospitals for FY2023.19 CMS has adopted the GMCS eCQM as part of the Hospital Inpatient Quality Reporting (IQR) Program measure set for which hospitals can self-select, beginning with the CY2024 reporting period/FY2026 payment determination and for subsequent years.19

Another resource developed through the MQii is an interdisciplinary Toolkit.20 The MQii Toolkit is an evidence-based guide that leads hospital providers through supporting older hospitalized patients’ quality malnutrition care, and its best practices and core concepts are relevant to all adult

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**Figure 1.** 2019 Hospital readmissions for patients with malnutrition as stratified by race/ethnicity. Used with permission from Avalere Health.

**Figure 2.** Components of Academy Strategic Plan related to malnutrition, food insecurity, and health equity.6

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**Table 3.** Percent of Population with Malnutrition Readmissions for 2019 Hospital readmissions for patients with malnutrition as stratified by race/ethnicity.
patients, even though the Toolkit is designed to facilitate care of patients ages 65 years and older.\textsuperscript{21} The MQii Toolkit provides interdisciplinary team members guidance for the various components of malnutrition care: screening, assessment, diagnosis, care plan development, monitoring and evaluation, and discharge planning.

The aforementioned MQii Learning Collaborative\textsuperscript{22} is a community of clinicians committed to improving delivery of malnutrition care in hospitals and health systems across the United States. The Learning Collaborative was established in 2016 and now spans more than 300 members among 39 states and territories. These health care institutions undertake a data-driven, patient-centered, malnutrition quality improvement project at their respective organizations using a best practices MQii Toolkit and track and monitor improvement with adoption and uptake of the malnutrition eCQMs.

Quality Management Resources

The Academy’s Quality Management provides resources and tools to assist credentialed nutrition and dietetics practitioners in providing high-quality, equitable nutrition care and services. These include the Scope of Practice and Standards of Practice for RDNs and NDTRs.\textsuperscript{23,24} The Academy maintains the Definition of Terms List,\textsuperscript{12} which serve as standardized language for consistent application in practice settings and Academy documents. The List contains the Diversity and Health Equity category and includes definitions for terms such as culturally appropriate care, health disparities, health equity, and social determinants of health. The terms and definitions are used in a variety of ways, including organization requirements, public policy development, regulations related to professional licensure, and as needed by academia, research, professional publications, employers, industry, and practitioners and members.

In addition, the Quality Strategy and Health Equity Guide\textsuperscript{25} showcases major areas of the National Quality Strategy led by the Agency for Healthcare Research and Quality on behalf of the CMS Quality Action Plan and Social Determinants of Health tools and resources. The guide features a plethora of opportunities for RDN and NDTR involvement. Another tool developed by the Academy’s Quality Management are Practice Tips, which aid nutrition and dietetics practitioners in navigating their practice by providing resources and asking critical, thought-provoking questions. The “Practice Tips: Addressing Food and Nutrition Insecurity”\textsuperscript{26} provides key steps and outlines a path for RDNs to seize the opportunity to be leaders in identifying food insecurity and malnutrition and subsequently providing intervening resources. The Practice Tip also contains information related to the implementation of the Improvement Activity, “Implement Food Insecurity and Nutrition Risk Identification and Treatment Protocols,” for providers eligible to participate in the Merit-Based Incentive Payment System program.\textsuperscript{27}

Additional Academy Webpages and Initiatives

In addition to Quality Management resources and the MQii, the Academy dedicates other resources and initiatives to support credentialed nutrition and dietetics practitioner knowledge, skills, and advancement in topics related to malnutrition, food insecurity, and health equity (see Figure 3). The Clinical Malnutrition webpage\textsuperscript{28} houses information on the MQii, malnutrition resources from the Academy Journal collections, Evidence Analysis Library, and Nutrition Care Manuals, in addition to links for malnutrition resources from organizations such as the American Society for Parenteral and Enteral Nutrition and Defeat Malnutrition Today.

The Academy established an IDEA (inclusion, diversity, equity, and access) Hub\textsuperscript{29} that outlines the IDEA Action Plan (a sustainable, living document designed to move the dietetics profession toward an increasingly welcome and inclusive future), spotlights projects from various organizational units and affiliates, and offers IDEA-related Academy resources (eg, publications, videos, webinars, scholarships, and grants). These resources include links to Member Interest Groups, Journal articles such as “Advancing Equity: The Academy’s Commitment to Supporting Inclusion, Diversity, Equity, and Access,”\textsuperscript{30} IDEA awards and grants, and videos and webinars from other organizations.

The Food Security and Sustainability webpage\textsuperscript{31} provides RDNs and NDTRs with information and tools to address food insecurity and sustainability in the populations they serve. Resources described on this page include continuing professional education opportunities and the Future of Food Initiative, which began in 2012 as a joint project between the Academy Foundation, Feeding America, and National Dairy Council to help raise awareness of food insecurity as a public health issue. The Future of Food Initiative\textsuperscript{12} includes curricula for dietetic interns, a toolkit, fact sheets, infographics, and webinars. The Food Security and Sustainability webpage also describes the principles of a healthy, sustainable food system and gives a list of additional resources from entities such as UNICEF and the World Health Organization. Other resources

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Figure 3. Additional Academy resources related to malnutrition, food insecurity, and health equity.
related to food insecurity include journal articles such as the “Position of the Academy of Nutrition and Dietetics: Food Insecurity in the United States.” Credentialed nutrition and dietetics practitioners also can access information related to participating in malnutrition, food insecurity, or health equity policy and advocacy issues in the Academy Action Center. Action alerts bring the Academy’s policy issues to the attention of members of Congress and help to raise awareness and add legitimacy to a particular priority issue. Action Alert examples include supporting the Health Equity and Accountability Act and expanding Medicare medical nutrition therapy coverage.

**Highlighting Interprofessional Organizations Initiatives**

The Academy highlights similar efforts from interprofessional organizations by linking to their resources on eatrightpro.org. In addition to sharing their resources and initiatives, the Academy also collaborates with other organizations on Joint Position or Consensus Papers. One such example is the July 2019 Joint Position Paper by the Academy and the Society for Nutrition Education and Behavior on “Food and Nutrition Programs for Community-Residing Older Adults.” This article outlined the joint need to address issues such as food insecurity and malnutrition in the older adult population. The Academy also shares health equity resources from the American Medical Association and the Centers for Disease Control and Prevention.

**SUMMARY**

RDNs and NDTRs are committed to protecting patients, clients, the public, and the profession of nutrition and dietetics, with the aim of transforming care and achieving health equity. RDNs consistently engage in executing nutrition care services for patients at nutrition risk, with malnutrition, and who are food insecure. By continuously implementing key performance indicators and supporting expert-level standards of practice, RDNs are realizing their patients’ and clients’ significant improvement and advancement in clinical and economic outcomes across all patient populations. The Academy supports RDNs and NDTRs by developing and providing the outlined tools, resources, and initiatives related to malnutrition, food insecurity and health equity.

**References**


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**STATEMENT OF POTENTIAL CONFLICT OF INTEREST**

The Malnutrition Quality Improvement Initiative (MQii) is a project of the Academy of Nutrition and Dietetics, Avalere Health, and other stakeholders who participated in and provided guidance and expertise in this collaborative partnership. D. Buelsing Sowards is an employee of the Academy of Nutrition and Dietetics. S. McCauley is an employee of the Academy of Nutrition and Dietetics. N. Munoz is an employee of the VA Healthcare System.

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**AUTHOR CONTRIBUTIONS**

D. Buelsing Sowards drafted the outline and manuscript. S. McCauley reviewed and contributed to the outline. All coauthors reviewed, contributed to, and commented on subsequent drafts of the manuscript.
Malnutrition Quality Improvement Initiative
Data Support Continued Opportunities in Malnutrition Care

Michelle Bruno, MPP; Kirk Kerr, PhD; Christina Badaracco, MPH, RDN, LDN; Taylor Musser, MPH; Karl M. Kilgore, PhD

Malnutrition remains prevalent among hospitalized patients in the United States and is associated with higher morbidity, mortality, and utilization costs when compared with individuals without malnutrition. Furthermore, estimates that malnutrition affects up to 60% of hospitalized older adults, yet continues to go unrecognized or undertreated, highlight a need to improve care for this patient population. Quality improvement can play an integral role in generating value-based solutions and provide a pathway for registered dietitian nutritionists (RDNs) to be at the forefront of improving malnutrition care.

To address malnutrition for older adults in inpatient settings, the Academy of Nutrition and Dietetics, in partnership with Avalere Health and other stakeholders, spearheaded the Malnutrition Quality Improvement Initiative (MQii) in 2013. The MQii supports use of a dual-pronged approach for quality improvement by providing a toolkit to help hospitals implement best-practice malnutrition care and malnutrition-focused electronic clinical quality measures (eCQMs)—which are based on data from electronic health records that reflect the Nutrition Care Process—to track performance improvement.

Quality measures serve an increasingly important role in the US health care system. Individual providers, hospitals, health plans, and other entities delivering or coordinating care are subject to regulatory oversight and payment incentives based on quality measure performance. The development and maintenance of quality measures is completed through a scientific, evidence-based process to ensure they provide valid and reliable results. In 2021, the National Quality Forum, for the first time, endorsed a malnutrition-specific quality measure: the Global Malnutrition Composite Score (GMCS) (National Quality Forum no. 3592e).

In August 2022, the Centers for Medicare and Medicaid Services (CMS) included the GMCS in the CMS Inpatient Prospective Payment Systems Final Rule for acute care and long-term care hospitals for FY2023. CMS adopted the GMCS eCQM as part of the Hospital Inpatient Quality Reporting Program measure set for which hospitals can self-select, beginning with CY2024 reporting period/FY2026 payment determination and for subsequent years. Developed by the MQii, the GMCS is an unweighted average of four component measures for use in inpatient settings that were previously four individual eCQMs. The GMCS measures the following among hospitalized individuals:

- **Malnutrition screening** Proportion of inpatient hospitalizations among patients aged 65 years and older with a completed malnutrition screening within at admission;
- **Nutrition assessment** Proportion of inpatient hospitalizations among patients aged 65 years and older identified as at risk for malnutrition with a completed nutrition assessment by an RDN;
- **Malnutrition diagnosis** Proportion of inpatient hospitalizations among patients aged 65 years and older identified as malnourished with appropriate documentation of a malnutrition diagnosis; and

(Note: Since the time of this analysis, the specifications of the GMCS component measures have been updated to meet requirements for reporting through the Center for Medicare & Medicaid Services quality programs. The latest version of these measures can be found here: [https://ecqihhs.gov/ecqm/eh/pre-rulemaking/2023/cms986v1].)

Performance on these quality measures indicates the proportion of hospitalizations, ranging from zero to one, who received the care described. Further, data are collected from hospitals participating in the MQii Learning Collaborative—a collective group of hospitals independently using the toolkit and eCQMs to locally address malnutrition care in their respective institutions. Hospitals sharing data receive site-specific performance results on a quarterly basis, and collaborative-wide performance results semiannually. Improvement in performance is noted as an increase in rate over time.

This article highlights the most recent data available on the GMCS and its component measures from two hospital systems participating in the MQii Learning Collaborative, along with clinician insights from these systems on their experiences addressing malnutrition care. These two practice reviews demonstrate the value of tracking malnutrition care performance on these measures and the...
ability to use data to inform and tailor quality improvement efforts.

LATEST DATA FROM HOSPITALS PARTICIPATING IN THE MQii LEARNING COLLABORATIVE

The practice reviews presented in this section examine the data from the largest hospitals in two systems participating in the MQii Learning Collaborative: Intermountain Healthcare in Utah and UnityPoint Health-Des Moines in Iowa. The data show the quarterly performance of these two systems over time between January 2019 and June 2021 on the individual component measures as well as the GMCS.

The figures provided for Intermountain Health reflect aggregated data from five hospitals in its system and the figures for UnityPoint reflect aggregated data from three hospitals in its system. Because the hospitals have different numbers of patients for each time period, data show present the arithmetic average measure scores across the hospitals, weighted by the number of qualifying patient hospitalizations in each hospital.

To provide context for the factors that may have influenced performance on the measures, the authors interviewed key staff at both Intermountain Health and UnityPoint who were responsible for overseeing the process improvements for malnutrition care in their respective systems. Qualitative findings from these interviews have been incorporated into these reviews.

Practice Review 1: Intermountain Health

Intermountain Health is a nonprofit integrated delivery network, including 24 hospitals as well as a medical group, health plan, and other health services covering Idaho, Nevada, and Utah. The system represented in this article is based in Salt Lake City, Utah. Its nutrition department includes six clinical nutrition managers covering the various hospitals in the region. The hospitals in Utah contributing data include St George Regional (284 beds), Intermountain Medical Center (452 beds), LDS Hospital (262 beds), McKay Dee (320 beds), and Utah Valley (395 beds).

Intermountain Health’s performance (Figure 2) indicates a modest improvement overall on 2 of the measure components (malnutrition screening, from 0.80 to 0.88, and nutrition assessment, from 0.15 to 0.20), a decrease in performance on the diagnosis documentation component (from 0.62 to 0.41), and little to no change on the care plan development component and the GMCS when comparing the baseline data point (Q1: 2019) to the final data point (Q2: 2021).

The clinical nutrition manager at Intermountain Health shared that her nutrition department had implemented quality improvement strategies for malnutrition during 2017 that aligned with joining the MQii Learning Collaborative in the spring of 2017. However, it was not until 2019 that the nutrition staff decided to take stock of their performance and begin reviewing their data reports more carefully. As a result, when the data across five facilities were reviewed and showed a similar downward trend in measure performance, a decision was made to review the data on a more regular basis and direct clinical workflow to focus on improving their performance. The team was particularly focused on improving Intermountain’s rate of documented malnutrition diagnoses and engaged programmers to further assess their clinical data on documentation. They identified that a key aspect of documenting malnutrition relied on physicians “moving” the malnutrition diagnosis established by RDNs into the problem list of a patient’s health record. A primary solution has since been to flag malnutrition diagnoses for physician action in the electronic health record system. Other solutions have been to conduct chart audits by peers to ensure malnutrition criteria for diagnoses are accurate, and to present malnutrition standards and diagnosis practices during on-boarding training for new staff. Efforts to similarly improve establishment of nutrition care plans include RDNs attending all physician-led patient rounds and proactively discussing and confirming care plans for all patients experiencing malnutrition during those rounds.

During 2020, an internal dashboard was created to continue to monitor the eCQM data, which is shared with the five participating facilities on a regular monthly basis. Therefore, the upward
trend in eCQM performance beginning in late 2019 can likely be attributed to bringing the audit and feedback cycle closer to the point of care and reflecting more timely malnutrition eCQM data that ultimately strengthened the hospital team’s commitment to quality improvement for malnutrition care.

Practice Review 2: UnityPoint

UnityPoint Health is a nonprofit network of hospitals, clinics, and home care services spanning Iowa, Illinois, and Wisconsin. It includes a total of 32 hospitals. This review examines data from the UnityPoint Health—Des Moines, Iowa, affiliate, which encompasses Iowa Methodist Medical Center (482 beds), Methodist West Hospital (95 beds), and Iowa Lutheran Hospital (208 beds).

UnityPoint’s experience illustrates how tracking performance of a composite measure on its own may not tell a complete story (see Figure 3). Although performance on the GMCS is relatively high and stable over time—>0.80 across the entire observation period—performance on the individual component measures reveal opportunities for further improvement. Figure 3 shows overall improvements over time on two of the measure components (nutrition assessment from 0.57 to 0.65, and care plan development from 0.76 to 0.83) and slight perceived declines over time, but no meaningful change on the high-performance rates of the other two measure components (nutrition screening from 0.94 to 0.90, and diagnosis documentation from 0.99 to 0.97).

While speaking with key personnel at UnityPoint Health, including the clinical nutrition manager covering these three hospitals, the authors learned that the RDNs on her team have been committed to improving malnutrition care since 2016, before joining the MQii Learning Collaborative during fall 2018. At that time, its nutrition department was working to consistently implement the Malnutrition Screening Tool and train all RDNs to conduct Nutrition Focused Physical Exams. However, outside of the nutrition department, awareness of RDNs’ efforts to address malnutrition care remained low. It was not until internal data on the financial revenue gains associated with treating malnutrition was brought to the attention of hospital administrators and executive leaders that malnutrition became an area of focus for other hospital departments.

To support that work, UnityPoint joined the MQii in 2018, gaining access to the data provided on the initiative’s eCQMs. Review of data from its first year of performance indicated that further care improvements could be made. In comparing clinical documentation with claims data, UnityPoint’s Health Information Integrity Specialists observed that documentation of nearly all their malnutrition processes were less than optimal. Upon learning this, the nutrition department chose to focus attention on improving the documentation of malnutrition diagnoses. The hospital implemented an educational program targeted toward physicians and midlevel providers, which was well received. The program included instructions from information technology staff via remote conference calls on how to record a malnutrition diagnosis in the malnutrition template of the electronic health record (which contains recommended nutrition diagnosis and related notes from RDNs), followed by e-mail evaluations and feedback on performance. These efforts help explain the high rates of performance for malnutrition diagnosis documentation sustained by UnityPoint during the observation period. The physician documentation support team continues to monitor the documented rate of malnutrition conditions by specialty group and individual physicians. This includes ongoing education and feedback to physicians as well as collaboration with the manager of nutrition and dietetics.

In addition, in 2019, the nutrition and dietetics department switched its reporting structure to reside under the nursing department instead of within integrated services. This change enabled the nutrition and dietetics department to request additional staff and obtain the support needed to augment its team of RDNs. The
repositioning was also critical for improving the coordination with nursing and physician teams to further close gaps in nutrition care. These organizational changes may explain the improvements that UnityPoint facilities saw related to conducting nutrition assessments and nutrition care planning during the observation period.

Opportunities for Continued Improvement

Overall, the system-level data in Figures 2 and 3 show wide variation in performance across the individual measures and over time, illustrating the challenges and dynamic nature of conducting quality improvement in clinical settings. Several variables can influence the ability to change any one aspect of care or clinical workflow. Moreover, the effort required to educate all staff on new processes and to ensure interdisciplinary coordination can be substantial and may take several attempts before all team members are aware, bought in, and comfortable with new approaches. Nonetheless, change and improvement are possible. The examples from Intermountain Healthcare and UnityPoint Health highlight not only the value of using data to understand how clinical care teams are performing, but also the importance of effectively communicating the data to the relevant care teams to impact workflow changes. These practice reviews also reinforce the potential value and benefit that use of malnutrition measures can have on clinical performance and outcomes.14

A Closer Look at Conducting Nutrition Assessments

Amidst the progress each system has made to improve key components of its malnutrition care, opportunities remain to continue improving performance. Notably, conducting nutrition assessments is a component on which both health systems had the lowest performance rates.

To better understand the lower performance rate of this component for both health systems, the authors examined the numerator (ie, the number of completed nutrition assessments) and denominator (ie, the hospitalizations among patients who screened positively for malnutrition) values of this component for each system. Given what is known about the burden of the coronavirus disease (COVID-19) pandemic on Americans’ health and access to healthy food, the authors suspected that the denominator values might have increased more rapidly than clinical RDNs’ ability to perform assessments and accurately identify malnutrition. Indeed, this seems to be the case; Figure 4 shows that the values of both numerators and denominators across all data-reporting facilities in these systems changed at different rates.

Intermountain has not changed its nutrition staff level in recent years but communicated that several of its major hospitals are short-staffed due to changes in the patient population. Additionally, during the COVID-19 pandemic, RDNs were prohibited from entering the rooms of patients infected with the virus; this restriction limited their ability to perform nutrition assessments. This may further explain the widening gap between numerator and denominator counts from 2020 into 2021 (Figure 4A). UnityPoint, on the other hand, has increased the size of its clinical nutrition staff over the past 4 years yet still shows a slightly widening gap, indicating that the nutrition department may have been unable to keep up entirely with the growing patient case load (Figure 4B). Similar to the Intermountain Health system during the COVID-19 pandemic, the RDNS at UnityPoint were unable to go into patient rooms during the first year of the pandemic. But after the first year, they were fit-tested for N-95 respirator masks and powered air-purifying respirators that allowed them to resume conducting full in-person nutrition assessments for the remainder of the pandemic. This re-access to patients may have helped avoid further decreases in their performance for this measure and serves to highlight the importance of the

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**Figure 4.** Differences over time between numerator and denominator counts of nutrition assessment (Measure Component 2) at Intermountain Healthcare and UnityPoint.
physical exam component of nutrition assessments for providing quality care. Increasing the staff of clinical RDNs, seeking ways to further automate RDNs’ documentation (enabling them to see more patients), and/or increasing attention on reducing admissions (and readmissions) through community-based interventions may help to reduce the burden of increased demand. Of course, each hospital or hospital system will need to determine the most appropriate and feasible means to address malnutrition and readmissions in its patient populations. Continued communication with administrative departments and coordination with physician teams will help ensure that continued improvement efforts for malnutrition care are well supported. Involvement of quality teams will also be important to help drive performance measurement, provide data on progress, and identify areas for future improvement.

CONCLUSIONS

The reviews presented here support the need for continued monitoring of malnutrition care in hospitals and education of interdisciplinary care teams. They emphasize the benefit of using the GMCS and its component measures developed through the MQii and stewarded by the Academy of Nutrition and Dietetics to identify and address malnutrition among hospitalized older adults. The participating staff at these hospitals clearly shared the importance of accurate malnutrition diagnosis and how use of data can influence communication with interdisciplinary care teams to drive change in malnutrition care. The reviews also illustrate how data can be used to inform decisions regarding where to apply future improvement efforts, such as examining data on health disparities to pinpoint other areas of need. Furthermore, the RDNs on these practice review teams played integral roles to improve the larger teams’ care processes, serving as a model of leadership by raising awareness and taking action to advance malnutrition care.

**References**

AUTHOR INFORMATION
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AUTHOR CONTRIBUTIONS
M. Bruno developed the first draft of the manuscript and reviewed and commented on subsequent drafts of the manuscript. K. Kerr, C. Badaracco, and T. Musser reviewed and commented on all drafts of the manuscript. K. Kilgore provided statistical analysis of data and commented on drafts of the manuscript.
Nutrition Security at the Intersection of Health Equity and Quality Care

Improving the Health of Americans requires a dedicated and holistic advancement of access to quality and affordable health care as well as a strong focus on preventive care. Such prevention requires comprehensive nutrition care and services. The COVID-19 pandemic reinforced that social determinants of health (SDOH), including access to nutritious food, have a major impact on people’s health, well-being, and quality of life and that SDOHs are intrinsically linked to health equity. Malnutrition (most often protein-calorie malnutrition/undernutrition, particularly in older adults) can be a contributing factor to health inequities, whether caused by challenges from disease and functional limitations, food insecurity, other factors, or a combination of multiple causes. Awareness of the issues of malnutrition and limited access to nutritious food have helped propel an increased focus among policymakers and advocates to promote nutrition security. This article identifies how nutrition security for older adults (aged 65+ years) intersects with health equity and then identifies specific policies to help ensure nutrition security. In addition, the article defines links between nutrition security for older adults and quality health care, particularly links supporting the three aims of the National Quality Strategy. Specific opportunities for action are identified throughout the article, highlighting how credentialed nutrition and dietetics practitioners can help support nutrition security.

Nutrition Security and Health Equity

Over the past five decades, there has been increased understanding of the nature and scope of health disparities in the United States and that the burdens of disease and poor health and the benefits of well-being and good health are not equitably distributed. An unhealthy diet is recognized as one of the top contributors to poor health, and disparities in diet quality by socioeconomic status can contribute to health disparities. Communities of color are disproportionately impacted; for example, data from the U.S. Department of Agriculture (USDA) Economic Research Service consistently document non-Hispanic Black and Hispanic populations have had, and continue to have, higher rates of food insecurity and very low food security compared with all households and with White non-Hispanic households.

Concerns about disparities in health outcomes have led to a call for shifting from domestic policies primarily focused on providing sufficient calories and quantities of food to a less siloed approach that can advance both nutrition and food security priorities by addressing nutrition security holistically. Nutrition security is defined as having consistent access to and availability and affordability of foods that promote well-being and prevent disease. Although nutrition security has long been recognized as a global health issue, the focus within the United States on nutrition security has emerged more recently. Some scholars advise that the term food security has long included a nutrition domain and thus the move to a new measure of nutrition security is not needed. In 2021, the Biden Administration announced its intention to invest $5 billion to “strengthen food systems in the United States, including through investments in systems and infrastructure to ensure access to healthy diets for all Americans.” Further reinforcing this message, USDA’s Actions on Nutrition Security report comments that “Promoting both food and nutrition security is a core priority for the U.S. Department of Agriculture and supports the Biden Administration’s whole-of-government approach to improve health and wellness, reduce diet-related chronic diseases, and advance health equity.” More recently, the Biden Administration has announced plans for a White House Conference on Hunger, Nutrition and Health that “will accelerate progress and drive significant change to end hunger, improve nutrition and physical activity, reduce diet-related disease, and close the disparities around them.”

Policies and Programs to Help Ensure Nutrition Security

The approach to address nutrition security is multifaceted. It starts with understanding the links between nutrition security, SDOH, and health equity. The Department of Health and Human Services’ Healthy People 2030 framework categorizes SDOH into five core domains (Figure 1). Healthy People 2030 references nutrition in explaining how SDOH contribute to wide health disparities and inequities by citing the example that “people who don’t have access to grocery stores with healthy foods are less likely to have good nutrition. That raises their risk of health conditions like heart disease, diabetes, and obesity—and even lowers life expectancy relative to people who do have access to healthy foods.” Furthermore, the Healthy People 2030 objectives emphasize the importance of impacting “upstream” factors that may not even be directly related to health care delivery. These could include transportation factors, [link to article for more information].
Nutrition can interface with social determinants of health (SDOH)

Figure 1. Healthy People 2030’s five domains of social determinants of health.

which impact access to nutrition care services and grocery stores, or language and literacy skills that can impact the ability to learn about a healthy diet. Yet, although some Healthy People 2030 objectives are specific to reducing household food insecurity and hunger and increasing fruit and vegetable consumption in the general population, no objectives are specific to nutrition security or malnutrition for older adults.

The Academy of Nutrition and Dietetics (Academy) has outlined recommendations for addressing health disparities specifically tied to SDOH and supports investigating the root causes of health disparities by examining the SDOH that play a role in the causes and health disparities by engaging the community. It also provides a spatial overview of community abilities and

successes in accessing healthy food, which could be useful for credentialed nutrition and dietetics practitioners working with community-based organizations.

Multiple federal programs exist for older adults that target SDOH related to nutritional health and economic stability. Older Americans Act (OAA) nutrition programs provide congregate and home-delivered meals through local agencies, and the Supplemental Nutrition Assistance Program (SNAP) provides benefits to purchase food and education (SNAP-Ed) to help promote the purchase of healthy food. OAA nutrition programs are funded at a set budget, meaning they are not entitlement programs and therefore not all who qualify will receive services if adequate funding is not available in their area. Adequate funding to meet OAA program demand has long been an issue because both program and food costs have continued to grow without commensurate increases in funding. Ujvari et al. found that when adjusted for inflation, total funding appropriated for OAA nutrition services over the past 18 years fell by 8 percent, a decline of $80 million in 2019. In addition, although OAA program eligibility includes all adults over age 60, the OAA specifically prioritizes services to those with the greatest social/economic needs, including racial and ethnic minorities. One study has documented that although 36 states effectively enroll racial and ethnic minorities in OAA programs, only 16 states effectively enroll Hispanic older adults, and thus many states have opportunities to expand their outreach efforts to more diverse groups.

The SNAP program is an entitlement program, meaning all Americans who qualify (ie, meet income or resource limits and other requirements) are “entitled” to receive SNAP benefits. However, compared with all eligible people, older adults have a lower SNAP participation rate, 42% participation for those aged 60+ vs 82% participation for all eligible people. SNAP participation can benefit health outcomes; longitudinal data suggest food-insecure older adults who participate in SNAP are 46% less likely to be hospitalized than nonparticipating older adults. Yet, the issue remains that nine of 10 SNAP participants face barriers in providing their household with a healthy diet throughout the month, with the most common barrier being the cost of healthy foods.

The Academy has long supported a reevaluation of the Thrifty Food Plan (used to calculate SNAP benefits) to help ensure access to nutritious, affordable food. Progress occurred when the Biden Administration released a reevaluation of the Thrifty Food Plan in Fall 2021. The Administration subsequently approved a significant and permanent increase in SNAP benefits (average SNAP benefit increased by 21%), the single largest increase in the program's history. Other long-term solutions are required because OAA funding (in particular) will continue to fall short with the burgeoning older adult population. Specific health equity policy opportunities for credentialed nutrition and dietetics practitioners to help address these issues are outlined in Figure 2.

NUTRITION SECURITY AND QUALITY HEALTH CARE

The National Quality Strategy (NQS), created by the Agency for Healthcare Research and Quality to guide local,
FROM THE ACADEMY

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<td>Advance need for specific federal public health goals targeting increased nutrition security for older adults</td>
<td>Develop a specific Healthy People 2030 objective on reducing malnutrition in older adults</td>
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<td>Support increased Older Americans Act (OAA) nutrition program appropriation levels, and providing permanent flexibilities during emergencies</td>
<td>Allow OAA nutrition programs to quickly pivot during an emergency from congregate to grab-and-go or home-delivered meals or to help older adults who may become homebound because of health or other issues impacting access</td>
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<tr>
<td>Advocate for development of programs beyond Supplemental Nutrition Assistance Program (SNAP), specifically tailored to populations with very low food security to help lift them out of poverty</td>
<td>Integrate OAA and Senior Farmers’ Market Nutrition Programs to allow distribution of food boxes through congregate feeding sites or home-delivered meals. Expand and make permanent the Elderly Simplified Application Project aimed at streamlining enrollment of low-income older adults in SNAP</td>
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Figure 2. Health equity policy-related opportunities for nutrition and dietetics professional engagement

**Linking Nutrition Security to the NQS Aim of Better Care**

Better care starts with the hospital, where health issues are documented but malnutrition or undernutrition is often not identified or treated. This is evidenced by statistics that indicate 20% of hospital readmissions are related to nutrition care.36 Nutrition is an integral part of management and care for these chronic conditions. In addition, nearly one third of Medicare beneficiaries have functional limitations in activities of daily living, which can impact their ability to buy, prepare, and consume food. The higher prevalence of chronic conditions and functional limitations underscores why the burden of malnutrition is not distributed equally.13 A recent analysis of data from the Malnutrition Quality Improvement Initiative Learning Collaborative found substantial disparities in hospital malnutrition diagnoses and readmissions. Specifically, RDNs identified malnutrition/undernutrition more often in adult non-Hispanic Black patients compared with other racial/ethnic groups, and adult non-Hispanic Black patients with malnutrition had a readmission rate of over 26%, whereas the rate was less than 19% for non-Hispanic White patients.34 Similarly, Guenter et al identified that malnutrition is more prevalent among hospital patients who are Black, from lower-income communities, and older. These same groups also have higher risk for food insecurity; as identified earlier in this paper, non-Hispanic Blacks and Hispanics experience higher rates of food insecurity and very low food security than do other populations.4,5 In addition, results of the 2021 Household Pulse Survey indicate that 2 million adults aged 65+ reported their household sometimes or often did not have enough food to eat during the past 7 days.35

Better health is also a concern because 80% of older adults have one or more chronic conditions, and half have at least two chronic conditions.36 Nutrition is an integral part of management and care for these chronic conditions. In addition, nearly one third of Medicare beneficiaries have functional limitations in activities of daily living, which can impact their ability to buy, prepare, and consume food. The higher prevalence of chronic conditions and functional limitations underscores why the burden of malnutrition is not distributed equally.13 A recent analysis of data from the Malnutrition Quality Improvement Initiative Learning Collaborative found substantial disparities in hospital malnutrition diagnoses and readmissions. Specifically, RDNs identified malnutrition/undernutrition more often in adult non-Hispanic Black patients compared with other racial/ethnic groups, and adult non-Hispanic Black patients with malnutrition had a readmission rate of over 26%, whereas the rate was less than 19% for non-Hispanic White patients.34 Similarly, Guenter et al identified that malnutrition is more prevalent among hospital patients who are Black, from lower-income communities, and older. These same groups also have higher risk for food insecurity; as identified earlier in this paper, non-Hispanic Blacks and Hispanics experience higher rates of food insecurity and very low food security than do other populations.4,5 In addition, results of the 2021 Household Pulse Survey indicate that 2 million adults aged 65+ reported their household sometimes or often did not have enough food to eat during the past 7 days.35

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**Linking Nutrition Security to the NQS Aim of Better Health**

Prioritizing nutrition security promotes better health for at-risk individuals and communities across the continuum of care. Dietetics professionals play a critical role in addressing nutrition security needs through interventions that identify and intervene for specific causes of malnutrition, whether related to disease or medical condition or limited access to nutritious food. The GMCS is already endorsed by the National Quality Forum and is supported by more than 100 hospitals nationwide that have adopted malnutrition quality measures as part of the Malnutrition Quality Improvement Initiative Learning Collaborative.31 Furthermore, adoption of this measure is a multidisciplinary, open-access toolkit for helping educate clinical staff on how to implement a quality improvement program to advance malnutrition care.32

**Policy opportunity**

- Better Care—improve quality by making health care patient-centered, reliable, accessible, and safe
- Better Health—improve health by supporting proven interventions to address behavioral, social, and environmental determinants of health
- Lower Costs—reduce cost of quality health care for individuals, families, employers, and government

A focus on nutrition security in federal policies and programs can help inform each of these three areas.
There are multiple intersections among the National Quality Strategy (NQS) aims

Government Accountability Office has recommended that the Administration on Community Living (the agency with oversight of OAA programs) should “centralize information on promising approaches for making meal accommodations to meet the nutritional needs of older adult participants in the congregate and home-delivered meal programs.”

High rates of chronic conditions and functional limitations also reinforce the need for better integrating nutrition into care transitions and the role for medically tailored meals (meals prepared under the supervision of RDNs to meet the specific nutritional needs of older adult participants in the congregate and home-delivered meal programs).

A national dialogue on Advancing Patient-Centered Malnutrition Care Transitions identified that as patients transition from one point of care to another, their nutrition status is often not evaluated, documented, or even addressed in patient health conversations. The Dialogue recommended this need could be met by better integrating nutrition status into existing discharge protocols, pathways, and models as well as aligning incentives (e.g., policy and financial) with clinical malnutrition care delivery beyond the hospital to improve prevention, identification, and management. Medically tailored meals are beneficial, and participation in a medically tailored meals program has been associated with fewer hospital and skilled nursing admissions and less overall medical spending.

Further building the research base on older adult nutrition needs and the impact of nutrition security and malnutrition on health equity and health outcomes will help inform future efforts to better the health of the older adult population. The 2020-2025 Dietary Guidelines for Americans for the first time included recommendations for the older adult population and recognized that heightened risk of malnutrition occurs with age. However, the Dietary Guidelines Advisory Committee identified multiple areas in which the science on older adult nutrition was inconclusive. Indeed, the Government Accountability Office has identified that before the 2025-2030 Dietary Guidelines for Americans are published, more evidence is needed on the specific nutritional needs of older adults. Furthermore, Roberts et al have argued that “improved public health messaging about nutrition and aging, combined with routine screening and medical referrals for age-related conditions that can be treated with a nutrition prescription, should form core components of a national nutrition roadmap to reduce the epidemic of unhealthy aging.”

Linking Nutrition Security to the NQS Aim of Lower Costs

Improved nutrition security helps reduce health care costs. Malnourished hospitalized patients have a 54% higher likelihood of hospital 30-day readmissions, compared with non-malnourished patients, based on a study of non-maternal and non-neonatal US hospital stays. The resulting cost per readmission is nearly $17,000 per patient, depending on the specific type of malnutrition. It is estimated that for older adults, disease-associated malnutrition costs $51.3 billion annually. For the general adult population, food insecurity is associated with higher health care use and costs, even when controlling for other socioeconomic factors.

Medical nutrition therapy (MNT) is an important and cost-effective intervention for many chronic diseases. MNT is the nutritional diagnostic, therapy, and counseling services for disease management provided by an RDN. For older adults, access to MNT can help prevent, manage, and treat a wide range of chronic conditions, including those that have disproportionately impacted communities of color. However, currently Medicare coverage for MNT is restricted to only three conditions: diabetes, chronic kidney disease, and kidney transplantation.

In response, the Academy has worked closely with a bipartisan group of lawmakers to support introduction of The Medical Nutrition Therapy Act of 2021 (MNT Act). The bill expands access through Medicare Part B coverage of outpatient MNT for malnutrition, prediabetes, obesity, high blood pressure, high cholesterol, eating disorders, cancer, celiac disease, human immunodeficiency virus or acquired immune deficiency syndrome, and any other disease or condition causing unintentional weight loss, with authority granted to the Secretary of Health and Human Services to include other diseases based on medical necessity. The Academy has compiled the MNT evidence base for each condition that is part of the MNT Act. Health care policy opportunities for the MNT Act and other quality-related areas are detailed in Figure 4. Further definitions are provided in Figure 5.

SUMMARY

A focus on nutrition security and the recommended opportunities for credentialed nutrition and dietetics practitioners presented here support improved quality care as well as health equity and benefit older adults. Adoption of the GMCS measure in the hospital supports more thorough malnutrition care and earlier malnutrition interventions. This measure
reduces complications and health care costs, improves patient outcomes, and contributes to continuity of malnutrition care as patients transition home or to other care settings. Increased funding and expanded programming and resources to intervene for nutrition security at the community level help address health equity and lessen the impact of malnutrition on health outcomes at the health care institutional level. Monitoring of nutrition security and malnutrition quality of care through increased research, and inclusion in national surveys, help improve programs and provide the foundation for evidenced-based recommendations on the role and impact of nutrition security for older adults. Passage of the Health Equity and Accountability Act, which includes the Medical Nutrition Therapy Act of 2021 (MNT Act), will improve access to cost-effective MNT for chronic diseases/conditions, particularly for communities of color.

### Figure 4. Quality-related health care policy opportunities for credentialed nutrition and dietetics practitioners.

<table>
<thead>
<tr>
<th>Policy opportunity</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build on increased hospital attention to nutrition security and carry nutrition risk identification and intervention forward into the community</td>
<td>Lead exploration of unique partnerships between Medicare/Medicare Advantage programs and OAA nutrition programs</td>
</tr>
<tr>
<td>Help operationalize the Supporting Older Americans Act of 2020, which reauthorized and provided continued funding for Older Americans Act (OAA) programs and made several updates, including adding malnutrition to the OAA program’s purpose and participant screening</td>
<td>Help support a greater focus on malnutrition in OAA programs, which could include adding questions related to malnutrition and food insecurity risk to national surveys of the OAA program</td>
</tr>
<tr>
<td>Advocate for inclusion of malnutrition and food insecurity risk identification in older adult surveys and Medicare-related examinations</td>
<td>Add malnutrition and food insecurity risk questions to national surveys of older adult health and to Medicare new patient and annual wellness visit examinations, thus providing opportunities to better target “upstream” interventions that increase nutrition security</td>
</tr>
<tr>
<td>Advocate for more funding for older adult nutrition research to build the evidence base on older adult nutrition security for the 2025-2030 Dietary Guidelines for Americans</td>
<td>Lead and publish clinical studies related to nutrition security and malnutrition quality of care across the care continuum</td>
</tr>
<tr>
<td>Advocate for inclusion of malnutrition and food insecurity risk identification in older adult surveys and Medicare-related examinations</td>
<td>Advocate creating a separate Office of Nutrition Research within the National Institutes of Health, to help garner more federal focus and resources on older adult nutrition</td>
</tr>
<tr>
<td>Advocate for inclusion of malnutrition and food insecurity risk identification in older adult surveys and Medicare-related examinations</td>
<td>Advocate Congress pass the Health Equity and Accountability Act, which includes the Medical Nutrition Therapy Act of 2021 (MNT Act)</td>
</tr>
<tr>
<td>Help support a greater focus on malnutrition in OAA programs, which could include adding questions related to malnutrition and food insecurity risk to national surveys of the OAA program</td>
<td>Provide examples of how passing the MNT Act will help increase access to cost-effective MNT for chronic diseases/conditions, particularly for communities of color</td>
</tr>
</tbody>
</table>

### Figure 5. Terms and definitions.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Food insecurity</td>
<td>The economic and social condition of limited or uncertain access to adequate food.54</td>
</tr>
<tr>
<td>Food security</td>
<td>Access by all people at all times to enough food for an active, healthy life.53</td>
</tr>
<tr>
<td>Health disparity</td>
<td>Preventable differences among individuals and communities, usually in disease burden, access to care, and outcomes.54</td>
</tr>
<tr>
<td>Health equity</td>
<td>The state in which all individuals have the opportunity to achieve their full health potential.54</td>
</tr>
<tr>
<td>Medical nutrition therapy (MNT)</td>
<td>Evidence-based application of the Nutrition Care Process. The provision of MNT (to a patient/client) may include one or more of the following: nutrition assessment/reassessment, nutrition diagnosis, nutrition intervention and nutrition monitoring and evaluation that typically results in the prevention, delay, or management of diseases or conditions.55</td>
</tr>
<tr>
<td>Medically tailored meals</td>
<td>Meals prepared under the supervision of RDNs to meet the specific nutritional needs of individuals with chronic diseases.38</td>
</tr>
<tr>
<td>Nutrition security</td>
<td>The condition in which all Americans have consistent access to the safe, healthy, affordable foods essential to optimal health and well-being.54,56</td>
</tr>
<tr>
<td>Very low food security</td>
<td>Multiple indications of disrupted eating patterns and reduced food intake.57</td>
</tr>
</tbody>
</table>
manage chronic diseases. These proactive public health and health care policy actions are needed to address nutrition security and malnutrition care, thereby helping to support improved access to quality and affordable health care for all older Americans.

References


AUTHOR INFORMATION

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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

The Malnutrition Quality Improvement Initiative (MQii) is a project of the Academy of Nutrition and Dietetics, Avalere Health, and other stakeholders who participated in and provided guidance and expertise in this collaborative partnership. J. Blankenship is an employee of the Academy of Nutrition and Dietetics. R. Blancato is the national coordinator for the Defeat Malnutrition Today coalition.

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AUTHOR CONTRIBUTIONS

J. Blankenship and R. B. Blancato developed the first draft of the manuscript and reviewed and commented on subsequent drafts of the manuscript.
Reprint of: Development and Evaluation of a
Global Malnutrition Composite Score

Quality Measures Proliferated in the late 1990s and early 2000s and were first tied to financial performance incentives with the establishment of quality reporting programs for hospitals and then physicians. Quality measurement has since expanded to virtually all provider areas of health care in the United States. Despite this growth, one area where a major deficit persists has been nutrition care. This article outlines the process pursued by the Academy of Nutrition and Dietetics (Academy) and Avalere Health (Avalere) to develop the first of its kind electronically specified composite measure addressing malnutrition care for hospitalized adults.

Quality Measurement in Malnutrition Care
In the United States, national surveillance data from 2016 indicates that as many as 8% of hospitalized adults have a diagnosis of malnutrition. However, previous studies suggest that malnutrition and malnutrition risk may actually be found in as many as 20% to 50% of hospitalized patients, indicating a significant gap in the identification of malnutrition. Malnutrition is a critical predictor for inpatient adverse outcomes given its association with 30-day readmissions, length of stay (LOS), complications, and mortality. Despite this major gap in identification, no public quality reporting programs include performance measures focused on nutrition care or malnutrition.

Driven by the consistent and expanding evidence of the high prevalence of malnutrition in hospitalized patients across the United States, the Academy, along with Avalere and other stakeholders, developed and implemented the Malnutrition Quality Improvement Initiative (MQii). The MQii was established largely in response to the need for assessment quality of care provided to hospitalized patients who are malnourished or at risk of malnutrition. Through a dual-pronged approach, the MQii supports quality improvement (QI) for malnutrition care based on a set of four malnutrition-focused electronic clinical quality measures and a complementary MQii Toolkit that includes resources guiding implementation of QI activities.

A multi-stakeholder collaboration identified measure gaps in malnutrition care, which were translated into a set of individual electronic clinical quality measures (eCQMs). As part of the measure evaluation process, a technical expert panel had also been convened to weigh in on the initial measure concepts from both a clinical and technical perspective regarding data feasibility. These eCQMs were subsequently piloted at a large hospital in the Midwest, and the testing results demonstrated that the measures were usable for identifying key improvement areas in malnutrition care related to identifying risk, assessing for clinical malnutrition, developing the appropriate care plan, and ensuring the diagnosis of malnutrition is documented to support follow up care. The individual eCQMs that were tested are outlined in Figure 1.

The initial pilot testing of these novel malnutrition-focused eCQMs demonstrated that it was feasible to collect the data from existing hospital electronic health record systems, and that the measures met minimum reliability and validity testing requirements as established by expert consensus.

Subsequently, the tested measures were adopted by a national learning collaborative of hospitals all implementing the principles of the MQii. A group of 27 US hospitals reported use of the four eCQMs to guide various QI projects focused on improving care provided to hospitalized patients who are malnourished or at risk of malnutrition. The participating collaborative hospitals reported changes in measure performance based on implementation of cyclical quality improvement initiatives at their respective institutions. With this new aggregate data, multivariate analyses were conducted to identify the relationships between performance on these implemented eCQMs with patient outcomes of 30-day readmission and LOS. The study results concluded that the measures could be successfully implemented in a cohort of diverse hospitals in the United States. Furthermore, the study demonstrated that when supported by QI tools, the hospitals were able to see meaningful improvements in measure performance. In addition, the multivariate analysis demonstrated that all four measures were significantly associated with outcomes of 30-day readmissions and patient LOS.

The Global Malnutrition Composite Score
These initial studies were crucial in establishing the evidentiary basis for the four malnutrition-focused eCQMs, which were being adopted across dozens of hospital systems throughout the country. As work with the Centers for Medicare and Medicaid Services (CMS) continued, an external panel of experts from CMS provided feedback to develop a composite measure—The
Global Malnutrition Composite Score (GMCS)—constructed from the four individual eCQMs. CMS defines a composite measure as a performance measure representing a “combination of two or more component measures, each of which individually reflects quality of care, into a single performance measure with a single score.” Composite measures facilitate the grouping of multiple quality of care constructs into a single value that more comprehensively assesses quality. The intent is that the composite performance score can be influenced in some way by each component score and have a summary score that can reflect the totality of the components. The feedback produced by a composite measure condenses a broader range of metrics that would be more challenging to otherwise assess comprehensively.

Best practices for composite measure development include ensuring all included component measures have a common orientation or focus (eg, domains of a specific area of health care quality) that may be broad in nature (overall quality of care in a disease state) or narrow (adherence to a specific set of guidance), composite component measures are justified by clinical evidence, presence of a demonstrated gap in care or outcomes, and component measures are empirically evaluated for reliability and validity.

Learning from the experience of building and testing the individual malnutrition-focused eCQMs referenced above, the Academy and Avalere (the measure development team) launched a composite measure development process to implement the feedback received from the external review.

Developing the GMCS

The measure development team studied existing composite measures and identified an initial framework and objective for the eventual composite measure. Informed by the experience of the hospitals implementing the individual malnutrition-focused eCQMs, the development team determined the focus of the proposed composite measure would be on optimal malnutrition care for adults aged 65 years and older who are admitted to inpatient service and receive care appropriate to their level of malnutrition risk and/or malnutrition diagnosis if identified.

The GMCS includes four component measures that are first scored separately as proportion measures. The four component measures (Figure 2) represent slight variations from the original individual eCQMs (Figure 1). The composite measure components were established using empirical testing by determining which individual components would most contribute to a sound overall composite score. The overall composite score is derived from averaging the individual performance scores for the following component measures:

1. Screening for malnutrition risk at admission;
2. Completing a nutrition assessment for patients who screened for risk of malnutrition;
3. Appropriate documentation of malnutrition diagnosis in the patient’s medical record when this is indicated by the assessment findings; and
4. Development of a nutrition care plan for malnourished patients, including the recommended treatment plan.

The process for risk identification, diagnosis, and treatment of malnutrition necessitates a multidisciplinary care team that begins with identification of an initial risk population for more thorough assessment by a registered dietitian nutritionist (RDN). An RDN, in turn, provides the necessary treatment recommendations to address nutritional status and the clinical indicators that inform a medical diagnosis of malnutrition documented by a physician. As described above, the four component measures individually only provide a fraction of the necessary information on quality of care for patients at risk of malnutrition. For example, knowing which patients have been assessed out of those who were initially identified as at risk, but not knowing whether or not the appropriate documentation is present, is essential for providing context.

### Table: Individual Malnutrition-Focused EHQMs

<table>
<thead>
<tr>
<th>eCQM</th>
<th>Measure name</th>
<th>Measure description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Completion of a malnutrition screening within 24 h of admission</td>
<td>Patients aged ≥18 y who received a malnutrition screening and results are documented in their medical record within 24 h of their admission to the hospital</td>
</tr>
<tr>
<td>2</td>
<td>Completion of a nutrition assessment for patients identified as at risk for malnutrition within 24 h of a malnutrition screening</td>
<td>Patients aged ≥65 y who were identified to be at risk of malnutrition from a screening were provided a nutrition assessment within 24 h of the screening</td>
</tr>
<tr>
<td>3</td>
<td>Nutrition care plan for patients identified as malnourished after a completed nutrition assessment</td>
<td>Patients aged ≥65 y who were assessed and found to be malnourished should also have a documented nutrition care plan in their medical record</td>
</tr>
<tr>
<td>4</td>
<td>Appropriate documentation of a malnutrition diagnosis</td>
<td>Patients aged ≥65 y who were assessed and found to be malnourished should have a physician-confirmed diagnosis of malnutrition documented in their medical record to ensure care plan implementation and transfer of necessary medical information upon discharge</td>
</tr>
</tbody>
</table>

Figure 1. Individual malnutrition-focused electronic clinical quality measures (eCQMs).
proportion of patients were screened upon admission would be an insufficient assessment of quality of care. Therefore, the composite measure offers a more comprehensive assessment of follow-through on best practices for patients at risk of malnutrition. One analogous example can be found in a composite measure developed to better assess quality of care for patients with type 1 diabetes. Although glycated hemoglobin level is the traditional marker for glycemic control, guidelines promote several other steps to care for patients with type 1 diabetes and track their outcomes more comprehensively. Therefore, the reported composite measure includes three domains of care with corresponding component measures: management tools, diabetes care assessment, and complications risk.\textsuperscript{13}

Composite measures reflect the individual component measures of which they are comprised. Consequently, a composite measure’s validity and usefulness is dependent on the accuracy of the individual measures as well as the methodology for combining the individual measures into a combined measure. The National Quality Forum outlines four key steps to developing a composite measure: \textsuperscript{14}

1. Defining the composite measure’s purpose and theoretical framework,
2. Selecting the appropriate individual component measures for inclusion,
3. Establishing the methodology for combining the selected component measures, and
4. Empirically testing the validity and reliability of the overall composite

Similar to individual performance measures, composite measures must also be tested to demonstrate reliability (that the measure is well defined and can be implemented consistently within and across measured entities), and validity (that the measure logic and scoring accurately captures the intent of the measure).\textsuperscript{11} In the case that individual components have not been empirically tested, developers should first ensure that the individual components are empirically sound and robust before considering their inclusion in the composite. After being evaluated individually, the components can be incorporated in one of the many aggregation approaches outlined above and tested as a set to ensure reliability and validity in predetermined combination.

**GMCS Development Methodology**

The findings from the outcome analyses were used to inform the inclusion and exclusion of data elements and modifications to the existing individual malnutrition eCQMs in a newly proposed GMCS.\textsuperscript{10} As determined by the empirical validity testing outlined in the Composite Measure Evaluation section below, each of the main components of this measure is strongly correlated with outcomes that have been empirically associated with malnutrition, including 30-day readmissions and hospital LOS. The measurement development team identified that each component was correlated in a significant way to both malnutrition as a clinical outcome as well as the sequelae of untreated malnutrition, including readmissions and longer LOS. Components that were excluded from the proposed GMCS included process-oriented timing intervals for admission-to-screening and screening-

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**Figure 2.** Global malnutrition composite score component measure details.

<table>
<thead>
<tr>
<th>Component measure name</th>
<th>Denominator</th>
<th>Numerator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening for Malnutrition Risk at Admission</td>
<td>All patients in the measure population with a documented malnutrition screening no more than 48 h before admission to the hospital</td>
<td>All patients in the measure population who are documented as at risk for malnutrition via the completed malnutrition screening</td>
</tr>
<tr>
<td>Completion of a Nutrition Assessment for Patients who Screened for Risk of Malnutrition</td>
<td>Patients from the measure population who are documented as at risk for malnutrition via the completed malnutrition screening</td>
<td>Patients at risk of malnutrition who have a completed nutrition assessment documented</td>
</tr>
<tr>
<td>Appropriate Documentation of Malnutrition Diagnosis for Patients Identified with Malnutrition</td>
<td>Patients from the measure population who have a completed nutrition assessment documented with findings of moderate or severe malnutrition</td>
<td>Patients who have been identified as moderately or severely malnourished by the nutrition assessment who also have a documented medical diagnosis of malnutrition in their medical record</td>
</tr>
<tr>
<td>Development of a Nutrition Care Plan for Malnourished Patients</td>
<td>Patients from the measure population who have a documented medical diagnosis of malnutrition in their medical record</td>
<td>Patients with a documented medical diagnosis of malnutrition in their medical record who have a documented nutrition care plan with treatment recommendations to address malnutrition</td>
</tr>
</tbody>
</table>
to-assessment to reduce methodological complexity of the GMCS.

Rationale for Measure Scoring
The approach to measure scoring is considerably important for composite measures because they are a mathematical computation of multiple individual metrics. In practice, there are several ways that composite measures may be scored via the included components. Common methods include all-or-none scoring where a binary outcome of performance met or not met only occurs when performance is met on all components, any-or-none scoring where the performance on the composite is met if at least one of the component measure’s performance criteria is met, opportunity scoring is a patient-based scoring method that is based on a particular number of care events being met for a patient in the measure, linear scoring where the composite score is based on a sum of component scores in which the performance is met, and weighted scoring where each component score is assigned a weight factor and the overall composite score is the sum of the weighted scores.

The measure development team proposed constructing the composite measure as an arithmetic average of the four components weighed equally, given that all components were significantly correlated to the important outcomes of malnutrition, 30-day readmissions, and LOS. In clinical practice, all four steps are critical components of the nutrition care process. Patients who are diagnosed and treated for malnutrition by a care team are often first identified by a nutrition screening for malnutrition risk around the time of admission. Next, based on the screening results, the patient is referred to an RDN for assessment and recommendations for malnutrition diagnosis and nutrition intervention. The names, denominators, and numerators of the final composite measure components are outlined in Figure 2. Each measure component is a proportion with a possible performance score of 0 to 100%. After each component score is calculated, an unweighted average of all four scores is completed to determine the final composite score with a total score ranging from 0 to 100%.

Composite Measure Evaluation Methodology
As outlined by National Quality Forum’s Measure Evaluation Criteria and Guidance,14 all performance measures should be tested for reliability and validity to ensure they are precise or repeatable (indicating reliability), and they accurately reflect quality of care provided and can identify differences in quality (indicating validity). To that end, a large analytic patient dataset was assembled from data reported by 56 acute care hospitals across 10 states (N = 179,336). Data were collected at the encounter level and included information on each patient encounter: LOS, discharge status, and 30-day readmission flag, screening for malnutrition risk, nutrition assessment and subsequent nutrition care plan development by an RDN, and diagnosis of malnutrition by the attending physician. Data quality was a concern for the time-to-screening data point for patients above the 99th percentile and were therefore excluded from the analysis. The capture of screening data longer than 48 hours before admission was also not included in the dataset because they are considered not to be clinically reliable.

Reliability Testing. The goal of reliability testing of performance measures is to demonstrate that the calculated composite score can detect true differences between measured entities (eg, hospitals or clinicians) from random measurement error.14 Mathematically, a reliability coefficient is estimated as the ratio of true variance over the sum of the true variance and error variance. The value is constrained to fall between 0 and 1, with values closer to 1 indicating stronger reliability. In most instances, a reliability index of 0.70 or greater is regarded as acceptable for drawing conclusions about groups, although a value of 0.80 or higher is desirable. In the present study, GMCS reliability was assessed by fitting an intercept-only generalized linear mixed model (GLMM) to the composite score data. The GLMM variance components were then used to estimate the intraclass correlation coefficient (ICC), a variant of the Pearson correlation coefficient that is widely used to assess the reliability of group- and cluster-based measurements.15

Validity Testing at Composite Score Level. Composite measures validity testing seeks to confirm that the composite measure score is highly associated with outcomes that have been supported by the evidence (30-day readmissions and LOS). The overall composite measure was first tested for construct validity at the score level by constructing a hierarchical linear regression model. The hierarchical linear regression model was conducted to demonstrate that the predictability of the model significantly improved when the components in aggregate were included into the model over standard predictors of these outcomes such as patient characteristics and primary diagnoses. A stepwise approach was taken to measure the explanatory power of the malnutrition-associated measure components (ability of the components to explain the outcome). Initially, the hospital 30-day readmissions and LOS models were estimated using only the demographic and clinical variables. Later, the models were re-estimated, including the malnutrition variables. This approach allowed the measure development team to estimate the incremental improvement in goodness-of-fit from including the malnutrition variables. Model goodness-of-fit was reported as adjusted-R² for the hospital LOS model and the concordance statistic (c-statistic) for the 30-day readmissions model.

A secondary analysis was conducted to specifically assess the association between the main clinical end point of the composite measure (nutrition care plans for patients with a diagnosis of malnutrition) and the outcomes most associated with malnutrition (30-day readmissions and LOS). The analysis intended to understand the association of having a nutrition care plan with a malnutrition diagnosis vs not having a nutrition care plan.

Validity Testing for Component Measures—Critical Data Elements. Validity was also studied for the component measures by developing a generalized linear (logistic) regression model where medical diagnosis of malnutrition was the response variable and screening (completion and result) and assessment variables (completion, timing, and result) were the predictor variables.
variables. An additional test was conducted to ensure the overall linear model for predicting diagnosis was also predictive of the nutrition care plan. The hypothesis for this test is that all predictor variables would be correlated to the outcome of malnutrition diagnosis and together would be a strong predictor of the malnutrition outcome, supporting the validity of including these components in the malnutrition composite.

In addition to testing the components of the measure for validity toward the outcome of the composite measure, testing was completed to assess the correlation between the components and outcome of the composite measure with the clinical outcomes of patient LOS and 30-day readmissions. This phase of testing assessed the predictive relationship between the set of measure components and LOS and readmissions, adjusting for differences in patient characteristics. A generalized linear mixed model approach was utilized to conduct the analyses.

**Testing Composite Measure Denominator Exclusions.** The two main exclusions for this measure are a LOS <24 hours because those patients are not in the hospital long enough to receive proper assessment, and intervention care plan for malnutrition. Patients who are transferred or discharged to hospice have significantly different requirements for nutrition support and those treatment plans are highly dependent on patient preferences.

The measure development team tested measure exclusion criteria for both influence on the measure performance score and validity statistics for the individual malnutrition eCQMs when they were first developed. The measure development team tested the measure specifications with a set of hypothetically measure exclusions that were determined by consensus agreement of the Technical Expert Panel (consisting of a group of clinical and technical experts whose guidance was sought by the measure development team) but were not explicitly identified in the evidence review. The measure performance score of each respective testing site was assessed with and without the exclusion criteria to determine the exclusion criteria's influence on the facility's score.

**Composite Measure Evaluation Results**

**Reliability Testing Results.** Component measures were calculated using data provided by 10 health systems composed of 47 affiliated hospitals. To be included in the reliability testing, a reporting entity was required to have sufficient data collected on a minimum of 20 encounters for at least three of four GMCS component measures. Moreover, patients were required to be eligible for each of the four individual component measures, thereby ensuring the completeness of data. After removing low-frequency entities (N = 7), the GLMM was fitted to the data, and the ICC was then estimated, as described previously, using the model variance components. The resulting ICC value was 0.839, indicating that GMCS reliability falls within the acceptable range and thus, can be regarded as suitable for differentiating provider groups along the measurement continuum.

**Validity Testing Results.** The composite measure validity testing revealed that the malnutrition indicators are significantly related to LOS and readmissions after controlling for the other variables that were included in the model (ie, patient demographics, primary diagnosis, and comorbidities) known to be predictive of those outcomes. The $R^2$ statistic for the LOS model was found to be 0.063 before the inclusion of the four aggregate measure components and 0.288 after $(P < 0.001)$, and the c-statistic for the 30-day readmissions model was 0.614 before their inclusion and 0.625 after $(P < 0.01)$.

However, to better characterize the predictability of current malnutrition outcomes model for LOS and readmissions, the predictability was compared for the Hierarchical Condition Category risk-adjustment model implemented by CMS. The Hierarchical Condition Category model predicts total annual health care costs and demonstrates the predictive ability for individuals of prospective diagnosis-based models had $R^2$ values ranging from 0.0186 to 0.1246. Given the statistics shared above, the strength of predictability of this model and overall measure is adequate and comparable to those already being implemented by CMS for similar purposes.

The secondary analysis of the relationship between a documented nutrition care plan and risk of 30-day readmissions in patients with a malnutrition diagnosis showed a statistically significant relative risk reduction of 24% (21.4% vs 26.5%, respectively) in the likelihood of 30-day readmissions (odds ratio = 0.74, 99% CI 0.558 to 0.941). For LOS, hospitalized patients with a malnutrition diagnosis who had a nutrition care plan had, on average, a 3-day longer LOS than malnourished patients without a nutrition care plan (LOS of 9.46 vs 6.46 days, respectively; $P = 0.0001$). Consequently, it was identified that 30-day readmissions risk was inversely associated (care plans suggest a protective effect for malnourished patients). LOS was not. This is because, although patients who were diagnosed with malnutrition, a significant portion never saw received an RDN assessment and therefore did not have a nutrition care plan documented. These patients often were discharged earlier than those who did receive an RDN assessment and the proper nutrition treatment plan. An item-level analysis demonstrated, a patient with a nutrition care plan has a LOS than a patient who does not have a care plan regardless of malnutrition status. More studies need to be conducted that thoroughly examine this phenomenon surrounding malnourished patients, nutrition care plans, and LOS in the data that continue to be reported by hospitals around the country.

As reported in the results of both analyses, the composite measure results are strongly correlated to important clinical outcomes associated with malnutrition in the literature, 30-day readmissions, and LOS. Furthermore, the secondary analysis demonstrated that nutrition care plans may be associated with a reduced risk of 30-day readmission for those with malnutrition vs those who are diagnosed with malnutrition but do not have a nutrition care plan.

**Validity Testing for Component Measures—Critical Data Elements.** As outlined in Table 1, all main effects and 2-way interactions were highly significant
Table 1. Results of generalized linear regression model on composite outcome

<table>
<thead>
<tr>
<th>Effect</th>
<th>df</th>
<th>Wald $\chi^2$</th>
<th>$P$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening result</td>
<td>2</td>
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<td>&lt; .0001</td>
</tr>
<tr>
<td>Time to assessment</td>
<td>2</td>
<td>1094.5</td>
<td>&lt; .0001</td>
</tr>
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<td>Assessment result</td>
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<tr>
<td>screening result × assessment result</td>
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<td>609.0</td>
<td>&lt; .0001</td>
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<tr>
<td>Malnutrition diagnosis × nutrition care plan</td>
<td>1</td>
<td>7584.5</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>c-statistic*</td>
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<td></td>
<td>0.828</td>
</tr>
</tbody>
</table>

*Fit of the overall score.

Composite Measure Denominator Exclusions Testing Results. In the original measure testing of the individual components, it was identified that neither of the exclusion criteria had significant influence on the performance scores. Because measures were constructed with and without exclusions, no $P$ values reached significance when a two-tailed $t$ test was performed on the difference between the performance scores (Table 2).

Table 2. Composite measure denominator exclusions $t$ test results

<table>
<thead>
<tr>
<th>Component measure name</th>
<th>$t$ test</th>
<th>$P$ value</th>
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<td>Malnutrition Diagnosis</td>
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<td></td>
</tr>
<tr>
<td>Nutrition Care Plan</td>
<td>$&gt; 0.3$</td>
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</table>

Recommendations for Composite Measure Use

Composite Performance Score Interpretation. The results of the validity testing at both the component and overall composite level support the inclusion of each of the component measures into the composite. Each component is independently associated with the overall quality construct and is predictive of outcomes of interest. In aggregate, the components together are better predictors of important patient outcomes of care than just patient characteristics alone. Therefore, the unweighted statistical average of the four components which results in the overall performance score for each reporting entity represents a quality construct that can be interpreted as representing a comprehensive assessment of quality of care for this population.

To facilitate a simpler way to compare providers on an equal footing, a three-tier scoring scale was established. Participating hospitals were grouped into three tiers that reflect organizations with composite measure performance scores above, overlapping, or below the 95% estimate generated in a bootstrap analysis described below. If a hospital’s composite score was assigned a Tier 3 score, it was above the estimated confidence interval (CI) and implies that the specific hospital’s performance was above the average of the estimate developed from the aggregate of all reporting sites. A hospital receiving a Tier 2 score means their performance was not meaningfully different than the estimated mean. Finally, a hospital receiving a Tier 1 score implies that their composite performance score fell below the mean estimate interval reflective of lower-than-expected performance.

To construct this tiering system, a bootstrap resampling methodology was employed to generate a 95% CI around the composite score mean. The 95% CI is then used to group providers into performance categories (ie, high, medium, or low). Among hospitals that meet the case minimum of 20 patients and at least three reportable measures, 44.7% of hospitals were in the highest performing Tier 3, 14.5% were in Tier 2, and 40.4% were in Tier 1. This tiering approach informed by the bootstrap sample derived from the observed performance measures was used to appropriately distinguish sites with varying degrees of performance among the component measures. These differences ultimately translated to variation in performance on the overall composite measure. The sample of sites used in the development of this composite measure is relatively homogeneous because the participating hospitals have been targeting improvement on these quality measure constructs for 1 to 3 years.

Data Capture and Reporting. As outlined in consensus guidance from the Academy and the American Society for Parenteral and Enteral Nutrition, it is recommended that hospital care teams properly map out their existing workflows to best identify the existence and structure of the necessary data elements for reporting this malnutrition composite measure. One hospital group reported their experience and lessons learned with initial implementation of the individual component measures that served as a helpful guide for measure implementers to reference. Furthermore, the pilot study site that originally tested the individual malnutrition eCQMs informed the development of GMCS reported that the improvements to the electronic health record workflows would best be pursued in a continuous quality improvement process. This would allow hospitals the time necessary to successfully modify existing workflows, pilot test the
changes, and gain clinician acceptance and compliance with workflow adjustments. Furthermore, other expert consensus groups that have focused on composite measure development and use have recommended that any composite measure that is developed should be capable of deconstruction to facilitate performance improvement. More specifically, apart from reporting the overall composite score, it is important that providers can also see the performance on individual component measures to allow for targeted quality improvement efforts that reflect the areas of improvement unique to the reporting entity.

**Composite Measure Limitations.** Of note, a potential challenge or limitation of composite measures is that without a transparent and understandable methodology, they may be limited in providing actionable information to stakeholders on a clinician's performance with respect to individual components. Moreover, the variance in performance within specific measures may make them highly vulnerable to a subset of components depending on the weighting methodology. Therefore, composite measures need a strong evidence base to inform their development, a clearly outlined methodology, and a robust testing for accuracy and usefulness for them to serve as an effective tool for measuring quality of care.

**Policy and Practice Recommendations.** Ultimately, the results of testing the GMCS indicate that it is a compelling and comprehensive tool for assessing the quality of care provided to hospitalized patients, aged 65 years and older, at risk of malnutrition. This GMCS summarizes the key steps in the malnutrition care workflow that are necessary to identify and mitigate malnutrition risk in a timely and effective manner. For hospital providers, this composite measure may very well serve as an effective tool to understand the state of malnutrition care in their institution and help identify critical areas for quality improvement. As shown in the empirical testing, the collection of these indicators of malnutrition care may also be used to further study the influences of clinical malnutrition on patient outcomes and the effect of risk mitigation on adverse outcomes. Given the established relationship between malnutrition and critical outcomes that have substantial implications for health economics, further assessment of the performance improvement on this measure should consider influence on health care costs.

In the existing Inpatient Quality Reporting Program implemented by CMS, although there is considerable focus on some of the sequelae of malnutrition such as pressure ulcers, infections, 30-day readmissions, and mortality, no measure considering the role of nutrition has ever been included in this program. Given the proliferation of the GMCS component measures to dozens of hospitals around the country through the national hospital learning collaborative as part of the MQi and the rigorous empirical evaluation standards met by the measure development team, policymakers should consider the GMCS for provider pay-for-reporting and pay-for-performance programs like the Inpatient Quality Reporting Program. The inclusion of the GMCS could provide valuable information to providers, consumers, and federal stakeholders on nationwide performance on standards of nutrition care practice that have considerable implications for clinical and economic outcomes.

**References**

17. Dorner B, Friedrich EK. Position of the Academy of Nutrition and Dietetics: Individualized nutrition approaches for older adults: long-term care, post-acute...


Reprint of: Position of the Academy of Nutrition and Dietetics: Food Insecurity in the United States

ABSTRACT
It is the position of the Academy of Nutrition and Dietetics that systematic and sustained action is needed to achieve food and nutrition security in the United States. To achieve food security, effective interventions are needed, along with adequate funding for, and increased utilization of, food and nutrition assistance programs; inclusion of nutrition education in such programs; strategies to support individual and household economic stability; and research to measure impact on food insecurity- and health-related outcomes. Millions of individuals living in the United States experience food insecurity. Negative nutritional and non-nutritional outcomes are associated with food insecurity across the lifespan, including substandard academic achievement, inadequate intake of key nutrients, increased risk for chronic disease, and poor psychological and cognitive functioning. Registered dietitian nutritionists and nutrition and dietetics technicians, registered, play key roles in addressing food insecurity and are uniquely positioned to make valuable contributions through competent and collaborative practice, provision of comprehensive food and nutrition education and training, innovative research related to all aspects of food insecurity, and advocacy efforts at the local, state, regional, and national levels.


POSITION STATEMENT
It is the position of the Academy of Nutrition and Dietetics that systematic and sustained action is needed to achieve food and nutrition security in the United States. To achieve food security, effective interventions are needed, along with adequate funding for, and increased utilization of, food and nutrition assistance programs; inclusion of nutrition education in such programs; strategies to support individual and household economic stability; and research to measure impact on food insecurity- and health-related outcomes.

Access to enough food for an active, healthy life is a basic human need and fundamental right. Yet food insecurity, that is, the limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways,1,2 continues to affect millions of households across the United States.3 In this position paper, food insecurity and its related outcomes, spanning both individual and public health perspectives, highlight the necessity to promote, implement, and evaluate comprehensive approaches to achieve food security.4-6

The negative outcomes associated with food insecurity across the lifespan warrant attention. Multifaceted solutions across multiple sectors are being implemented in an effort to address this preventable public health issue. Food insecurity is being integrated into broader public health discussions and research efforts. For example, Healthy People 2020 includes two nutrition and weight status objectives targeting food insecurity: eliminate very-low food security among children (nutrition and weight status 12) and reduce household food insecurity and, in doing so, reduce hunger (nutrition and weight status 13).

A number of objectives within Healthy People 2020 also emphasize the importance of improving healthy food access.7 For the first time, the 2015-2020 Dietary Guidelines for Americans8 acknowledged the connection between food insecurity and health outcomes. In its report,9 the Advisory Committee encouraged more-robust federal nutrition policies and equity in access to sustainable and healthy environments. This statement emphasizes a deeper understanding of the intimate connection between poor health and household food insecurity. It also reinforces the criticality of addressing food insecurity through holistic approaches to promote optimal health and well-being. Furthermore, in 2013, the Academy of Nutrition and Dietetics’ House of Delegates created a Food and Nutrition Security Task Force to help outline and prioritize resources and action steps specific to the profession. The final Task Force action plan emphasized the importance of addressing food insecurity across several specialties within the dietetics profession from public health to clinical practice.10

Although the safety, security, and sustainability of the global food and water supply are of utmost importance, other position papers of the Academy of Nutrition and Dietetics focus on these topics.11,12 In addition, some Position and Practice Papers include aspects of food insecurity within the scope of the paper.13 This
Position Paper concentrates on US (domestic) food insecurity as defined by the US Department of Agriculture. Figure 1 summarizes key food-security–related terms.

**FOOD INSECURITY: PREVALENCE AND CHARACTERISTICS**

As illustrated in Figure 2, household food-insecurity rates spiked during the 2008-2011 recession to 14.9% of US households. Since 2011, food-insecurity rates have trended downward, with a cumulative statistically significant decline from 2011 to 2014 and a statistically significant decline from 2014 to 2015. In 2016, 12.3% of all US households (15.6 million households) experienced food insecurity sometime during the year. Of these households, 7.4% (9.4 million households) experienced low food security and 4.9% (6.1 million households) experienced very-low food security. Resources to access food-security estimates and trends in the United States at the national, state, and county levels, as well as related information, are summarized in Figure 3.

Consistent with previous US estimates, the 2016 data indicate that households struggling with poverty experience food insecurity at greater rates than other households. In fact, those with incomes below the income-to-poverty ratio (<1.00) were three times more likely to be food insecure (<1.00, 38.3% of households; <1.30, 35.7% of households; and <1.85, 31.6% of households), than the national average (12.3%). Income alone, however, is not the sole factor that contributes to household food insecurity. Characteristics of those who experience food insecurity at rates greater than the national average include households with children (16.5%); households with children and headed by a single female (31.6%) or single male (21.7%); households headed by a black non-Hispanic (22.5%) or Hispanic individual (18.5%); and households located in metropolitan (principal cities) areas (14.2%) or nonmetropolitan (rural) areas (15.0%).

Although food insecurity remains a concern for many older adults (65 years and older), their rates of household food insecurity (7.8% of households with an older adult; 8.9% of households with an older adult living alone) are lower than the national average. For seniors living with food insecurity, it is vital to recognize their unique health and social needs and implement targeted programs tailored to this vulnerable population.

Additional insight into food insecurity in the United States is gained from scientific research and studies conducted by organizations that examine segments of the population at risk for, or experiencing, food insecurity. The Feeding America network of food banks and hunger-relief programs, which serves more than 46 million people annually, conducted the 2014 Hunger in America study. Of the 60,000 network client households surveyed, 85% self-identified as food insecure. Of those served by the Feeding America network, 43% self-identified as white, 26% as African American, and 20% as Latino. Overall, this represents 1 in 7 people in the United States, including 1 in 4 African Americans, 1 in 6 Latinos, and 1 in 10 white non-Hispanics in the United States.

The US Conference of Mayors Report on Hunger and Homelessness encompassed 32 American cities in 24

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**Definitions**

**Food security**

Food security for a household means access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum:

- The ready availability of nutritionally adequate and safe foods.
- Assured ability to acquire acceptable foods in socially acceptable ways (that is, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies).

**Food insecurity**

Food insecurity is the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

**US Department of Agriculture Food Security Classifications**

**Food security**

- **High food security:** No reported indications of food-access problems or limitations.
- **Marginal food security:** One or two reported indications, typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake.

**Food insecurity**

- **Low food security:** Reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.
- **Very-low food security:** Reports of multiple indications of disrupted eating patterns and reduced food intake.

**Figure 1.** Food-security–related definitions and classifications.
Food insecurity is often an episodic, recurrent phenomenon. On average, a household remains food insecure for 7 months out of the year.\(^2\) This results in times of the month and years when food is more readily available and accessible than others. Food availability is often unpredictable and cyclical for high-risk households, and this food instability is a distinct and understudied aspect of food insecurity that underlies many of the coping strategies observed in food-insecure households.\(^1\) Regardless of cause, individuals and households experiencing food insecurity often deploy coping strategies, such as seeking calorically dense and satiating foods that are often nutritionally inadequate, which can limit dietary variety or promote overeating when food is available.\(^2\) The subsequent risk factors and adaptive behaviors observed among many people struggling with food insecurity explain some of the associated health outcomes discussed here.

### FOOD INSECURITY: POTENTIAL CAUSES AND CORRELATIONS

Household food insecurity often stems from limited resources. As such, poverty, underemployment or unemployment, and high housing costs are strongly associated with food insecurity.\(^1\) The literature also demonstrates that food insecurity is often triggered by inflation, food prices, or a specific event that stresses the household budget, such as losing a job or benefits (including Supplemental Nutrition Assistance Program [SNAP]), or gaining a household resident.\(^2,23\) Tuttle and Beatty\(^24\) underscored the vulnerability of low-income households to food insecurity on expected increases in gasoline, natural gas, and electricity prices. A rise in price increases the probability of household food insecurity, and a decrease in prices lowers the probability.\(^2\) Food-insecure households must make difficult tradeoffs, such as choosing between buying food and buying or paying for other items or needs, including medication,\(^25,26\) housing,\(^27\) and utilities.\(^28,29\) Of those relying on the Feeding America network, 69% report competing demands between paying for food and utilities, 66% between food and medicine/medical bills, and 31% between food and education.\(^17\)

Many strategies are used by households experiencing food insecurity to obtain sufficient food resources. These include, but are not limited to, participating in federal food and nutrition assistance programs, obtaining food from charitable or emergency feeding systems (food pantries, soup kitchens, and shelters), gardening fruits and vegetables for home use, hunting/fishing for household food, receiving aid from family and friends, and purchasing less-expensive foods.\(^17\)

### FOOD INSECURITY: NUTRITIONAL AND HEALTH OUTCOMES AND ASSOCIATIONS ACROSS THE LIFESPAN

Food insecurity is a high priority for public health stakeholders, given its negative impact from both public health and economic perspectives.\(^20\) Documented outcomes include physical impairments related to insufficient or inadequate dietary intakes, psychological issues related to a lack of consistent and adequate food access, and sociofamilial disturbances.\(^23\) Across the lifespan, food insecurity often results in disrupted eating patterns that can lead to suboptimal nutritional status.\(^27,30-34\) These changes in dietary consumption contribute to negative physical and mental outcomes and an increased risk for disease. These nutrition-related health outcomes will

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**Figure 2.** Food-insecurity prevalence trends in the United States.\(^3\) USDA=US Department of Agriculture.

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\(^{1}\) Beatty\(^24\) underscored the vulnerability of low-income households to food insecurity on expected increases in gasoline, natural gas, and electricity prices. A rise in price increases the probability of household food insecurity, and a decrease in prices lowers the probability.\(^2\) Food-insecure households must make difficult tradeoffs, such as choosing between buying food and buying or paying for other items or needs, including medication,\(^25,26\) housing,\(^27\) and utilities.\(^28,29\) Of those relying on the Feeding America network, 69% report competing demands between paying for food and utilities, 66% between food and medicine/medical bills, and 31% between food and education.\(^17\)

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**Figure 2.** Food-insecurity prevalence trends in the United States.\(^3\) USDA=US Department of Agriculture.
be explained in detail in the sections that follow and are grouped according to lifespan.

Food Insecurity and Dietary Intake

Overall, the literature demonstrates that individuals residing in food-insecure households often follow dietary patterns that are inadequate in specific foods and nutrients. These nutritional inadequacies may contribute to malnutrition and increased risk of poor health, chronic disease, and other outcomes. One explanation for variations in consumption between food-secure and food-insecure households may be linked to food expenditures. In 2016, the typical US household spent $50 per person on food weekly, with a median food-secure household spending 29% more on food than the median food-insecure household. Furthermore, nearly 80% of recipients of charitable food programs reported purchasing unhealthy, less-expensive food as a strategy to stretch their food budget. Not surprisingly, people utilizing charitable food sources indicated that fruits, vegetables, lean proteins, and dairy were the most desirable items, foods that are often inaccessible, in terms of both availability and affordability for many people living with food insecurity.

Child/Adolescent Health- and Development-Related Outcomes

Although children are typically protected from very-low food security in the United States, food insecurity and subsequent nutritional inadequacy is associated with lower overall dietary quality in children, especially older children. Food insecurity has been associated with decreased consumption of vegetables, particularly nutrient-rich, dark green vegetables, among US children. In contrast, Lorson and colleagues reported that, although total fruit and vegetable intakes of all US children were below recommended levels, intake did not vary among children from fully food-secure, marginally food-secure, low food-secure, and very-low food-secure households. At the same time, compared with their food-secure counterparts, the proportion of french fries consumed by children and adolescents living in food-insecure households accounted for a greater proportion of total vegetable intake. Widome and colleagues examined diet quality and food insecurity among middle and high school youth. Compared with youth living in food-secure households, youth living in food-insecure households consumed a greater percentage of calories from fat, ate fewer family meals and breakfasts, had less food availability at home, and perceived greater barriers to consuming a healthful diet. Low dietary iron (in young children and adolescents) and low fruit intakes were also associated with food insecurity.

Gundersen and Kreider reported that children living in food-insecure households had a greater risk for a myriad of health and related problems, including poor overall health, mental health and psychosocial issues, frequent stomach and headaches, more hospital admissions, and higher rates of iron deficiency, and that they exhibited poorer developmental outcomes, including learning readiness. Furthermore, the authors suggested that previous studies may underestimate the negative causal impacts of food insecurity on health, due to, among others, the mismeasurement of household food insecurity. Chronic health conditions and behaviors, including anemia and asthma; childhood aggression; anxiety and depression; hyperactivity; dental caries; fracture risk (among males); and reduced physical activity, have all been associated with food insecurity.

The literature remains inconsistent related to food insecurity and increased risk for childhood/adolescent overweight and obesity. Nguyen and colleagues reported that, in a nationally representative sample of children 9 to 17 years of age, body mass index was not significantly different among household food-security groups. Yet, the relationship differed by participation in nutrition assistance programs (SNAP, National School Lunch), reinforcing the need for additional research.

In addition to chronic health conditions suffered by children living in food-insecure households, these children are also more likely to implement coping strategies that can increase their risk for chronic disease extending into adulthood. This includes erratic dietary patterns when food becomes available, such as binging eating and food hoarding.

Adult and Older Adult Chronic Disease Risk, Disease Management, and Environmental Contributors/Outcomes

Adults. Food insecurity among adults is associated with inadequate intakes of vitamin A and B-6, in addition to inadequate intake of vegetables, fruits, and dairy. Poor nutrition outcomes were also documented in nationally representative samples of food-insecure adults and older adults. Still other studies have focused on SNAP participants. When compared with income-eligible non-SNAP participants, SNAP participants consumed more sugar-sweetened beverages and empty calories. Overall, SNAP participants had lower diet quality for many components, yet reported consuming less saturated fat and sodium.

Among US adults, energy intakes did not differ between food-secure and food-insecure adults. Rather, meal and snack behaviors differed, with food-insecure adults consuming fewer, but larger, meals and more snacks. This eating behavior may have compensated for the reduced meal frequency.

These and similar studies underscore the importance of adequately assessing meal and snack behaviors, dietary patterns, and dietary supplement intakes, rather than focusing solely on energy intake when evaluating diet quality of adults living with food insecurity, especially among those participating in SNAP.

While the mechanisms remain poorly understood, adult food insecurity has been associated with poor physical and mental health status. Specific health conditions associated with food insecurity include inflammation, which is correlated with numerous chronic conditions sleep disorders, kidney disease, human immunodeficiency virus infection, diabetes, and depression (in women). Depression, while associated with food insecurity, may be reduced by SNAP participation because some stressors can be alleviated through SNAP participation. In a nationally
<table>
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*Figure 3.* Resources to access food-security estimates and trends in the United States at the national, state, and county levels, as well as selected food-security–related resources, programs, and organizations.
representative sample, among working-age US adults living at or below 200% of federal poverty level, lower food insecurity is associated with high probability of 10 chronic diseases, including hypertension, coronary heart disease, hepatitis, stroke, cancer, asthma, diabetes, arthritis, chronic obstructive pulmonary disease, and kidney disease. In fact, of those 10 conditions examined, food insecurity is predictive of all 10, while income is only predictive of 3.

While overweight and obesity coexist in those living in both food-secure and food-insecure households, food insecurity is associated with overweight and obesity among women from households experiencing marginal food security or low food security. Both food hoarding and overconsumption of energy-dense, nutrient-poor foods may contribute to this phenomenon.

In a national sample of US individuals with low-incomes, self-reported hyperlipidemia, hypertension, and diabetes were associated with food insecurity. More than half (58%) of households served by the Feeding America network reported that at least one household member had hypertension, and 33% of client households reported at least one member with diabetes. People living with food insecurity also have an increased risk of developing type 2 diabetes and also face many more challenges managing their disease.

In a nationally representative sample of adults with diabetes, Berkowitz and colleagues report that food insecurity is associated with poor glycemic and cholesterol control, even after controlling for numerous demographic, socioeconomic, and clinical factors.

Other health-related behaviors, such as smoking, are also associated with food insecurity. Although the literature remains limited, it is hypothesized that environmental factors also relate to or contribute to food insecurity. These factors, such as local food prices, availability of transportation, social capital, stress, and use of tobacco as an appetite suppressant, warrant additional research to better understand their relationship to, or impact on, food insecurity.

Olson reviewed food insecurity in adult females and emphasized that managing family feeding increases vulnerability to inadequate eating patterns. With the threat of approaching food insecurity, fruits and vegetables are often sacrificed in the diet. Women might modify their own dietary intakes to spare dependent family members, especially children, from experiencing deprivation. For US females who are pregnant, dietary iron intake is not significantly different between those living in food-secure and food-insecure households, yet food-insecure households consume less supplemental iron. This discrepancy results in a reduction in total iron intake, which increases the odds of iron deficiency by 2.9 times.

Older Adults. Food insecurity can have a more severe impact on older adults who may be in poor health and experience other physical, psychological, and social conditions that impact their food-security status. These conditions must be taken into account when addressing food insecurity within this vulnerable population. However, research regarding the effect of food insecurity on the nutrient intakes and health outcomes of older adults remains limited. Overall, there is an inverse relationship between age and food insecurity, even among older adults seeking assistance from emergency food sources. Yet, among those seeking charitable food assistance, households with older adults have some of the highest rates of hypertension and diabetes. Seventy-seven percent of households with a senior adult have at least one member with hypertension, and 47% had at least one member with diabetes. Among older Medicare beneficiaries, medication nonadherence can contribute to poor diabetes management.

Hernandez and colleagues assessed the association between overweight and obesity among a nationally representative sample of US adults aged 60 years and older with an income less than or equal to 200% of the federal poverty level and a body mass index of 18.5 (self-reported height and weight). While further research is needed to fully understand the relationship of food insecurity to overweight and obesity among older adults, unlike men, a significantly greater proportion of low-income, food-insecure women were obese (40%) compared with their food-secure counterparts (32%). In addition, a significantly lower proportion of low-income, food-insecure women were normal weight (26%) compared with food-secure women (35%).

Food insecurity among older adults may not only impact the risk of chronic disease, but can also increase the risk of disability and, in turn, negatively impact physical, emotional, and financial status. As such, food-insecure older adults have poorer dietary intake, nutritional status, and health status than food-secure older adults. Proper nutrition among this population is imperative because older adults

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aUSDA=US Department of Agriculture.

Figure 3. (continued) Resources to access food-security estimates and trends in the United States at the national, state, and county levels, as well as selected food-security—related resources, programs, and organizations.
often have unique nutritional needs and sometimes require specific diets to manage their health conditions. Addressing the risks of being food insecure among older adults is important because adults older than 65 years are expected to almost double in the United States by the year 2050.76

**Adults and Older Adults.** To date, most of the research on adults and older adults has examined health status using food insecurity as one predictor of outcomes. In a Canadian cohort, Tarasuk and others77 reported that most chronic physical and mental health conditions, such as diabetes, cardiovascular disease, fibromyalgia, and depression, increased the odds of food insecurity, independent of household demographics. Although further investigation is needed due to differing health care environments and food-insecurity measurement classifications in Canada, this study underscores the possibility that chronic physical and mental health conditions may precipitate household food insecurity.

**Health Care Utilization and Costs**

Because of the association between food insecurity and chronic disease, its implications on the quality, utilization, and cost of health care have been explored. Regarding type 2 diabetes, adults without reliable and consistent food access also have poorer medication adherence and report higher diabetes distress, both predictors of poor glycemic control and likely contributors to the higher utilization of health care.64 Unreliable access to food and the exhaustion of resources may also be responsible for the increase in hypoglycemia-related hospital admissions observed in low-income individuals when monthly benefits are depleted, a phenomena not observed among those with higher incomes.78

Despite having a different health care system than the United States, further insights into the increased health care costs of food insecurity come from a Canadian study that documented that total and mean health care costs (including inpatient hospital care, emergency department visits, physician services, same-day surgery, home care services, and prescription drugs) systematically increased with lower household food security.79 Further research is warranted to elucidate the health care costs associated with, and resulting from, food insecurity.

Consistent with other preventable health conditions and diseases, avoiding food insecurity or addressing it earlier in its cycle would be a wise and more cost-effective approach. The recent developments in the health care landscape have changed the incentive structures for health care providers, prioritizing both population and preventive health care.80 These shifts create an opportunity to integrate food-security strategies into the broader health care movement to address the social determinants of health both within and outside of the traditional hospital and health care environments.

**FOOD INSECURITY: STRATEGIES AND SOLUTIONS**

A variety of strategies are utilized by households when faced with fiscal resource constraints competing with food purchases. Robust safety-net programs appear vital in bridging temporary fiscal gaps associated with short-term food insecurity often resulting from transitional periods during unemployment, illness, disabilities, or other unforeseen economic stressors. Federal nutrition assistance programs, along with community-based programs, have been developed and implemented to improve food-security status. Although adequate funding for federal nutrition assistance programs is vital to maintain the integrity of the US nutrition safety net, it cannot be the sole response to this complex issue. Several federal and non-federal programs address a variety of aspects of food insecurity (Figure 3). In addition to these programs, state and local food-security centers, professional organizations, nonprofit organizations, including the charitable food system, and many foundations help support food-insecurity-related program responses and research. Overall, a long-term, systematic, broad-based approach is required to effectively sustain vital economic social systems to prevent and alleviate food insecurity.81

**Federal and Nonfederal Food and Nutrition Programs**

Additional research is needed to fully understand the breadth of benefits and long-term efficacy of federal and charitable food and nutrition assistance programs. Households with the highest levels of food insecurity are more likely to choose to participate in federal nutrition assistance programs, such as SNAP. This may explain why improvements in overall food-security rates are not greater for participants compared to nonparticipants of these programs.85 However, there is evidence that supports the association between participation in SNAP and lower levels of food insecurity when controlling for program selection bias.85

**Multifaceted Responses to Food Insecurity**

Long-term interventions and multifaceted initiatives are needed to positively impact and prevent food insecurity in the United States. These solutions should include connecting food-insecure households with adequate and nutritious food and providing nutrition education, while addressing the underlying causes of food insecurity, such as unemployment, underemployment, limited household resources/assets, unstable housing, poor health, low education, and poverty. McCullum and colleagues81 recommend creating multisector partnerships and networks that include government and public health agencies, educational institutions, nonprofit organizations, and the volunteer sector in developing the necessary infrastructure to reduce food insecurity and promote nutritional stability. Examples of collaborative initiatives include: 1) food and benefit outreach assistance programs supported by local nonprofit organizations, which connect qualified individuals to available benefits, such as federal nutrition programs, Medicaid, earned income tax credit, and economic support; 2) food purchasing incentive programs to reduce fiscal barriers and encourage nutritious food purchases; 3) initiatives to promote access to fresh produce in low-income communities (eg, farmers’ markets, glean programs, and community gardens); 4)
Education and Practice

- Incorporate food-security–related concepts and experiential learning into dietetics education programs using creative pedagogy.
- Promote and encourage students to participate in education programs that have a food insecurity/food bank supervised practice experience and/or concentration.
- Learn about food insecurity and its consequences on individuals, households, and communities.
- Conduct screening and measure food security status in all settings. Screen clients for food insecurity using a screening tool, such as the following validated 2-item screener by Hager and colleagues, and refer clients to appropriate health care and community-based resources:
  1. Within the past 12 months we worried whether our food would run out before we got money to buy more. (Response choices: sometimes, never, always)
  2. Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more. (Response choices: sometimes, never, always)
- Communicate food-insecurity–related information to other professionals, legislators, policy makers, and community members to increase awareness of food insecurity and its outcomes.
- Provide appropriate nutrition care by obtaining/considering food access- and availability-related information during assessments.
  - Understand the culture of the local community to further assist in determining appropriate questions and/or information to include about food and nutrition security during the nutritional care process. Information to gather may include:
    - factors such as food and beverage intake (amount/variety/quality);
    - food planning and purchasing abilities and limitations, including availability of transportation;
    - food acquisition practices, including gardening, farming, gleanings, hunting/fishing, and/or begging, borrowing, scavenging, or stealing food;
    - cultural food habits;
    - preparation abilities and limitations, including availability of appliances and utilities;
    - food-safety practices;
    - federal and community food and nutrition assistance program utilization;
    - information related to building and utilizing social networks;
    - anthropometric measurements, including growth pattern and/or weight changes; and
    - nutrition education needs regarding meal planning, purchasing, and preparation, label reading, and food safety.
  - Realize that food insecurity may make purchasing food difficult for the patient, thus preventing compliance to a prescribed diet.
  - Implement strategies to decrease food loss and waste throughout the food system, from producer to consumer.
  - Partner with other professionals to alleviate food insecurity (eg, pediatricians, physicians, and other health care professionals across specialty areas; public health professionals; school/child nutrition professionals; urban planners; and others).
  - Network with organizations and stakeholders addressing food insecurity within the community. Examples include food and nutrition assistance programs, emergency food and meal programs, food recovery groups, farmers’ markets, community-supported agriculture farms, community gardens, anti-hunger advocacy organizations, and food cooperatives.
  - Educate eligible clients on the availability and benefits of federal and non-federal resources available in the community and make referrals or recommend participation.
  - Develop innovative interventions and programs that provide nutrition education, training, and research to improve the food security of individuals, households, and communities.
  - Create initiatives highlighting the benefits of local, seasonal, and sustainably grown foods, focusing on the development of effective household management strategies and food preparation, and creating food-based projects that foster economic development.

(continued on next page)

Figure 4. Contributions that registered dietitian nutritionists and nutrition and dietetics technicians, registered, can make to improve food security in the United States.
 Roles and Responsibilities of Registered Dietitian Nutritionists and Nutrition and Dietetics Technicians, Registered

Registered dietitian nutritionists (RDNs) and nutrition and dietetics technicians, registered (NDTRs) across all areas of practice have a central role in addressing food insecurity and are uniquely positioned to lead and support developing, implementing, and evaluating strategies to improve food security. Figure 4 summarizes key areas where RDNs and NDTRs can continue to make valuable contributions toward achieving food security through community-based education, practice, research, advocacy, and public policy.

Immediately and sustainable responses by RDNs and NDTRs are warranted to achieve food security. Adequate funding for, and increased utilization of, nutrition assistance programs, as well as innovative programming to promote and support household stability, are paramount. Dietetics practitioners should capitalize on their translational professional training and expertise, as well as their professional networking through Academy of Nutrition and Dietetics’ policy, and public policy.

Advocacy and Public Policy

- Support legislative and regulatory processes that promote uniform, adequately funded food and nutrition assistance programs, nutrition education, and programs that support the economic stability of individuals and families.
- Serve as advocates for the nutritionally vulnerable individuals and groups at increased risk for food insecurity.
- Advocate to decrease the stigma of food assistance programs to increase participation rates.
- Eliminate barriers to healthy eating among those at risk for and experiencing food insecurity.
- Assist in efforts to improve food access and acquisition by individuals.
- Assist in efforts to reduce food loss and waste across the food system (e.g., food recovery and gleaning).
- Partner with national, local, and state anti-hunger advocacy organizations.
- Serve on a local food policy council, which examines local food systems and provides recommendations for social and public policy changes.
- Advocate that stores accepting SNAP have nutrient-dense offerings for clientele.
- Participate with Academy-related groups and use associated resources, including Academy Political Action Committee and annual Public Policy Workshop.

Research

- Conduct, translate, and disseminate research associated with food security/insecurity and related program efficacy, including safe, secure, and sustainable food systems. Examples include:
  - mapping and evaluating community processes;
  - documenting the nutritional value of emergency foods and donor practices;
  - investigating the causes and effects of food insecurity and its relationships with physical and mental health, nutritional status, and well-being of at-risk groups;
  - exploring the impact of food system issues, including seasonal variation in food availability on food insecurity;
  - assessing the travel distance between stores, farmers’ markets, and other venues accepting Special Nutrition Assistance Program (SNAP) and participants’ households and transportation availability; and
  - determining the effectiveness, such as cost–benefit analyses, of food recovery and other programs.
- Participate in evaluating community-based programs designed to address food insecurity.
- Partner with food security researchers, including those within the context of an interprofessional, integrated care team, and nonprofit organizations to determine what research gaps exist.

Figure 4. (continued) Contributions that registered dietitian nutritionists and nutrition and dietetics technicians, registered, can make to improve food security in the United States.
dietetic practice groups, member interest groups, state affiliates, and advocate for food-insecure households and programs aimed at alleviating food insecurity and its root causes.

RDNs and NDTRs should also advocate for the inclusion of dietetics practitioners in community-based initiatives and research. RDNs and NDTRs are uniquely positioned to address food loss and waste within the food system. In addition, RDNs and NDTRs can facilitate referrals, provide targeted education, and empower individuals struggling with food insecurity. Specifically, RDNs and NDTRs can help those struggling with food insecurity to access and connect with existing programs and social services aimed at improving food and nutrition security and other areas (eg, employment, housing, and transportation assistance). To build and sustain solutions to achieve food security and promote health, RDNs and NDTRs should engage in outreach efforts to forge partnerships among clinicians, charitable food providers, community partners, food processors, food retailers, other stakeholders, and people living with food insecurity.

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FROM THE ACADEMY


AUTHOR INFORMATION

This Academy of Nutrition and Dietetics position was adopted by the House of Delegates Leadership Team on April 22, 1990, and reaffirmed on September 4, 1994; June 22, 2000; May 24, 2004; May 17, 2007; and April 10, 2013. This position is in effect until December 31, 2024. Position papers should not be used to indicate endorsement of products or services. All requests to use portions of the position or republish in its entirety must be directed to the Academy at journal@eatright.org.

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We thank the reviewers for their many constructive comments and suggestions. The reviewers were not asked to endorse this position or the supporting paper.
Reprint of: Position of the Academy of Nutrition and Dietetics: Malnutrition (Undernutrition) Screening Tools for All Adults

ABSTRACT
It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the Malnutrition Screening Tool should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting. Malnutrition (undernutrition) screening is a simple process intended to quickly recognize individuals who may have a malnutrition diagnosis. While numerous malnutrition screening tools are in use, their levels of validity, agreement, reliability, and generalizability vary. The Academy of Nutrition and Dietetics reviewed the body of evidence supporting malnutrition screening tools and determined a single tool for identifying adults in all settings who may have malnutrition, regardless of their age or medical history. The Nutrition Screening for Adults Workgroup conducted a systematic review of the most robust evidence to promote using the highest-quality malnutrition screening tool available.

POSITION STATEMENT
It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the Malnutrition Screening Tool should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting.

POSITION FOCUS
Malnutrition occurs in health care settings, and in communities where people suffer from food insecurity and hunger. Thus, this position applies in all settings where food assistance and nutrition services are available. This position is based on a comprehensive systematic review and is intended to provide RDNs and all other health professionals with validity, agreement, reliability, and generalizability data for six malnutrition screening tools supported by the largest number of studies (Malnutrition Screening Tool [MST], Universal Screening Tool, Mini Nutritional Assessment—Short Form, Short Nutritional Assessment Questionnaire, Mini Nutritional Assessment—Short Form Body Mass Index, and Nutrition Risk Screening 2002). This position supports using a single tool to identify adults who may be malnourished regardless of age, acute and chronic medical conditions, or settings where care is received.

Position Statement Development Process
The Academy’s Nutrition Screening for Adults Workgroup systematically reviewed validation studies for malnutrition screening tools published in the peer-reviewed literature from January 1997 through July 2017 and used the results as a basis for this position. The Workgroup included tools that met the Academy’s 2011 definition of nutrition screening (Figure 1), which was created for an earlier version of this project. As in the earlier systematic review, the Workgroup sought quick and easy screening tools, defined as requiring fewer than 10 minutes to complete. For the current position, the requirement for robust data necessitated inclusion of tools with adequate supporting evidence, defined as greater than four validation studies. The Workgroup...
Nutrition screening is the process of identifying patients, clients, or groups who may have a nutrition diagnosis and benefit from nutrition assessment and intervention by a registered dietitian nutritionist (RDN).

**Key considerations:**
- May be conducted in any practice setting as appropriate
- Tools should be quick, easy to use, valid, and reliable for the patient population or setting
- Tools and parameters are established by RDNs, but the screening process may be carried out by nutrition and dietetics technician, registered and other trained personnel
- Nutrition screening and rescreening should occur within an appropriate time frame for the setting.

**Figure 1.** The Academy of Nutrition and Dietetics’ definition and key considerations for nutrition screening. (Reprinted with permission from Skipper and colleagues13; © 2012 American Society for Parenteral and Enteral Nutrition.)

considered the overall validity, agreement, and reliability results and grades of supporting evidence for each tool, then generalizability of each tool to the widest variety of medical diagnoses or age groups and settings and ranked the tools accordingly (Figure 2). The position paper was posted for public comment before publication.

**POSITION**
It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the MST should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting.

Ferguson and colleagues developed the MST to detect malnutrition or risk for malnutrition. Between 1999 and 2017, the MST was validated in acute, long-term, rehabilitation, and ambulatory care and oncology clinics in at least nine different countries. These studies revealed that the MST exhibited a moderate degree of validity, a moderate degree of agreement, and a moderate degree of inter-rater reliability in identifying malnutrition risk in adults (Figure 2). The strength of evidence for the MST is Grade I, good/strong with good generalizability. Some of the other tools also had high or moderate validity, agreement, or reliability, but were not supported by Grade I evidence or good generalizability.

**IMPLICATION FOR PRACTITIONERS**
While disease-, age-, or setting-specific malnutrition screening tools exist, most organizations where malnutrition screening occurs have clients or patients of different ages with one or more medical problems and provide nutrition care in a variety of settings. The value of using different screening tools for individuals with different personal characteristics is unclear, and subject to practical limitations. It is appropriate to implement the screening tool that will most accurately identify adults who may have malnutrition. Institutions and programs that implement the MST should have data available to consistently compare the populations screened for malnutrition, predict the resources for needed treatment, and support research.

Based upon the best available evidence, the Academy advocates that RDNs:
- Assume a strong leadership role in implementing the MST. A benefit to society occurs if individuals who may have malnutrition obtain nutrition assessment and intervention services from an RDN. This benefit is not without cost because of the time required for an RDN to complete a nutrition assessment. Thus, the impact of changes to screening procedures affects the amount of RDN time available to provide other required nutrition services and provides justification for RDNs to select and oversee implementation of malnutrition screening tools.
- Implement the MST without changes to the wording of the questions or the scoring system for referrals as originally presented. Adding items, modifying questions, or interpreting scores differently than intended by the authors of the tool should be avoided, as these changes invalidate the MST. Individual patients or clients with an MST score of ≥2 should achieve the greatest benefit from an RDN referral.
- Provide ongoing training to para-professionals who administer the MST and monitor the impact of the screening and referral process by summarizing data from individuals with malnutrition.
- Abandon all unvalidated malnutrition screening tools (eg, pressure injury and illness severity tools), including tools that were validated, then modified without rigorous re-validation against a standard definition of malnutrition.
- Discourage strongly the development of new screening tools in favor of further validating existing tools, especially in adults between the ages of 19 and 49 years, over age 90 years, and in community and long-term care settings.
- Research the costs and outcomes of the malnutrition screening procedure. Minimal data exist on the financial implications of the proper identification of patients who do or do not have malnutrition or the costs of the screening procedure. Obtaining these data could enable the projection of malnutrition assessment and intervention cost and should be a research priority.
- Research the minimum level of education and training needed to accurately administer the MST and develop education and training materials to facilitate consistency among users.
- Develop partnerships with patient advocacy groups, other health care professional organizations, and policy makers to implement the MST.

**CONCLUSIONS**
The amount and quality of evidence for validated malnutrition screening tools has grown considerably since an earlier
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*Sensitivity, specificity, positive predictive value, negative predictive value cutoffs: High: 90% to 100%, moderate: 80% to ≤89%, low: ≤79%; agreement and reliability κ cutoffs: High: 0.8 to 1; moderate: 0.6 to ≤7.9; low: ≤5.9.

*bSee Figure 3 in Skipper and colleagues* for the algorithm to determine the overall validity.

*cThe Workgroup determined generalizability based on usefulness of each tool across the broadest array of adult age groups, locations, diseases, and treatments according to evidence.

dElements considered in the evidence grade include quality of the evidence, consistency of results across studies, quantity of studies, and number of subjects, clinical impact of outcomes, and generalizability to population of interest.14

*eMST=Malnutrition Screening Tool.

*fMUST=Malnutrition Universal Screening Tool.

*gMNA-SF=Mini Nutritional Assessment—Short Form.

*hSNAQ=Short Nutritional Assessment Questionnaire.

*MNA-SF-BMI=Mini Nutritional Assessment—Short Form Body Mass Index.


**Figure 2.** Validity, agreement, reliability, generalizability, and strength of evidence of adult malnutrition (undernutrition) screening tools.
review of the topic. This additional evidence supports using a single tool, the MST, to screen all adults for malnutrition (undernutrition) in all settings where malnutrition screening occurs. Replacing other malnutrition screening tools, especially those not rigorously validated, with the MST is expected to identify persons with malnutrition and provide consistent data to support nutrition practice and policy.

References

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Reprint of: Social Determinants of Health: Enhancing Health Equity

Tony Peregrin

NUTRITION AND DIETETICS practitioners traditionally focus on modifying behavior to improve patient outcomes, but the Academy of Nutrition and Dietetics (Academy) also recognizes the role of social determinants of health (SDOH) when examining root causes of chronic diseases, such as high blood pressure, coronary heart disease, hepatitis, and stroke, particularly for minority and underserved populations.¹

The World Health Organization defines SDOH as “conditions in which people are born, grow, live, work and age,” and the Centers for Disease Control and Prevention offers a similar definition, which includes “conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes.”²⁻⁴ These determinants are tethered to the “distribution of money, power, and resources at global, national, and local levels.” According to the Academy’s Racial and Ethnic Health Disparities and Chronic Disease Issue Brief (Brief), which was released in January 2021, “Social determinants are most responsible for health inequities, the unfair and avoidable differences in health status seen within and between communities.”⁵ Specific to the nutrition and dietetics field, poverty and racial segregation limit access to healthful foods and safe neighborhoods.

A current example of an SDOH-related pathway, witnessed by registered dietitian nutritionists (RDNs) and other health care professionals, transpired during the coronavirus disease 2019 (COVID-19) pandemic, which has affected Black Americans at a disproportionate rate due to several factors, including systemic care delays and reduced access to testing, as well as differences in employment, with many minorities working public-facing jobs without paid leave.⁵⁻⁷ According to data released by the Centers for Disease Control and Prevention and published in the New York Times, both Black and Latino individuals have been “disproportionately affected by the coronavirus” throughout the United States across all age groups and in multiple settings, including urban, suburban, and rural areas. These data also reveal that Black and Latino people have been “nearly twice as likely to die from the virus as white people.” The data also show that Native American people were “far more likely to become infected than white people” and that in Arizona and other counties people who identified as Asian were 1.3 times as likely as white individuals to become infected.⁸

Along with these demonstrated inequities, COVID-19 has resulted in an increase in food insecurity, with many families experiencing reduced access to affordable, nutritious food for the first time, and compounding the issue for those already struggling. According to the Academy’s Brief, “Prior to the COVID-19 pandemic, more than 37 million people in the United States were affected by food insecurity; now more than 54 million people are projected to experience food insecurity due to the pandemic.”⁵

This article identifies the 5 domains of SDOH as characterized in Healthy People 2030, provides guidance for managing health data ethically, and outlines recommendations for addressing health disparities tied specifically to SDOH.

THE 5 DOMAINS OF SDOH

The Healthy People 2030 initiative, released in August 2020 by the US Department of Health and Human Services, places increased attention on SDOH over the next 10 years. A primary aim of the plan is to “create social, physical, and economic environments that promote attaining the full potential for health and well-being for all.”⁹,¹⁰ The initiative identifies the following 5 domains of SDOH:⑤,¹⁰: Education, Economic Stability, Social and Community Context, Health and Health Care, and the Built Environment.

The Academy’s Brief provides an overview of each domain as it “relates to health disparities, access to and consumption of culturally acceptable, healthful food, and the development of non-communicable chronic diseases with nutrition implications.”⁵

“Everyone is impacted by the social determinants of health as they are outlined in the Healthy People 2030...
plan,” said Sharon Cox, MA, RDN, LDN, FAND, Director, Academy House of Delegates and member Board of Directors. Cox is also strategist and co-founder of Cox Duncan Network, LLC, a minority-owned consulting firm based in Charlotte, NC. “These determinants are formed by the distribution of, and access to, life-enhancing resources such as food, housing, economic and social relationships, transportation, education, and health care. Unfortunately, in communities of color, we are seeing disparities and the inequitable distribution of these resources, and as a result, an increase in morbidity and mortality.”

An individual’s health status is determined by a combination of factors ranging from genetics to medical/clinical services, to the social and physical environment, as well as by personal behavior and lifestyle choices. A study conducted by the University of Wisconsin Health Institute found that 20% of a patient’s overall health is determined by services rendered by a physician and 30% is determined by individual lifestyle choices and behaviors (such as smoking, poor diet, lack of exercise, and alcohol abuse).11 Notably, the study found that 80% of an individual’s overall health is the result of socioeconomic status, physical environment, biology, and health behaviors.10,12

“Physical environment, social and economic factors drive most of those health outcomes, and even though these have not always been our focus in the past, they need to be focus areas in some key aspects of our work,” said Cox, noting that the health profession has traditionally examined downstream or midstream determinants. “The downstream approach is dealing one on one with individuals who are sick or injured using the biomedical approach to care. For food and nutrition professionals, this means providing high-quality clinical care to address chronic diseases, nutrition support before or after surgery, or when you work with dialysis patients. And that is where medical nutrition therapy comes in, which is an example of downstream care. The midstream approach focuses on the lifestyle and behavior of an individual and includes health promotion and prevention using a behaviorist approach. Examples of grassroots and community efforts include translating the dietary guidelines to meet the targeted population, cooking demonstrations, and more. We must demonstrate cultural humility and competency in all our interactions,” explained Cox.

If downstream care is defined as clinical care and service to the patient, and midstream care is related to modifying patient behavior, upstream determinants are those that occur at the macro-level and are those overarching factors that are largely outside the control of the individuals. Care involves a review of the conditions in which individuals are born, grow, live, work, and play—all of which are related to addressing SDOH.

“Upstream is the global or high-level condition in which you live,” said Jennifer Covich Bordenick, chief executive officer, eHealth Initiative Foundation, a nonprofit organization that convenes health care leaders to identify and share best practices related to health care technology and innovation. “Upstream is understanding where a person comes from—what neighborhood do they live in? How old are they? What’s their job? Upstream, midstream, and downstream are all important when working to improve patient health and outcomes.”

ETHICS AND HEALTH DATA

“Health care equity has always been a critical issue, but what is so powerful now is the fact that we’re able to collect some of this data now electronically and look at it next to other clinical data,” said Bordenick. “And I think that’s why people are starting to notice the role of social determinants in health care more. Twenty years ago, you couldn’t run an algorithm and identify homeless at-risk communities, people who didn’t have access to food. You couldn’t pull up that data and identify 900,000 people in your community that might be at risk and then go reach out to them.”

The use of SDOH data includes considerable ethical responsibility to ensure this information is protected and used solely for improving outcomes and community health. “It’s important to leverage this data appropriately and to verify that it is hosted in an environment that meets ongoing compliance standards,” noted Cox. “It’s also important to ensure that there is no bias in the predictability of the models formed from this data.”

The Guiding Principles for the Ethical Use of Social Determinants of Health Data document—developed by the eHealth Initiative Foundation through a cross-industry collaborative of health care stakeholders—was released in June 2019.13,14 This document urges organizations to “consider the potential impact of the use of SDOH on vulnerable populations and ensure the data is collected and used in a fair, unbiased, and scientific manner.”13,14 The guidelines encourage users to create standards for collecting and protecting data in accordance with all applicable federal and state laws and to develop best practices that address accessing, storing, and tracking of SDOH data.

The document outlines the following 5 guiding principles for the appropriate use of SDOH data for customizing health services and interventions13,14:

- **Care Coordination:** Identify individuals with SDOH needs, coordinate and deliver more holistic care, and facilitate connections to additional interventions or services, consistent with privacy and security protections
- **Recognizing Risk Through SDOH Analytics:** Identify risk through the use of analytic tools in order to develop population health management interventions for individuals and communities
- **Mapping Community Resources and Identifying Gaps:** Assess individual SDOH needs against available community resources to identify gaps that address health and wellness
- **Service and Impact Assessment:** Assess the impact of SDOH interventions and services
- **SDOH as a Tool for Customizing Health Services and Interventions:** Use SDOH as a guide for quality discussions with individuals (or their designated guardians) and caregivers to jointly decide which services and interventions are the best fit

The Academy/Commission on Dietetic Registration Code of Ethics, which includes a preamble, 4 principles, and 32 standards, reflects the values and ethical principles guiding the nutrition and dietetics profession. Principle 2, “Integrity in personal and
organizational behaviors and practices (Autonomy)” states that nutrition and dietetics practitioners shall “Safeguard patient/client confidentiality according to current regulations and laws,” which would include protecting against the disclosure of patient health information without consent as outlined in the Health Insurance Portability and Accountability Act, also known as HIPAA. 

Safeguarding patient confidentiality and privacy is a key ethical consideration when working with SDOH data, but it does not stop there—health care professionals are also ethically bound to use those data to close care gaps by mapping community resources and programs to local populations in a private and secure manner. 

CUSTOMIZE INTERVENTIONS TO ENSURE HEALTH EQUITY

“Our ability to map to community resources is a critical area for us as food and nutrition professionals, as is our ability to customize those services, which speaks to ensuring equity for these communities by providing culturally appropriate resources,” noted Cox.

“I think the more understanding we can have about the reality in which we live—that there are these implicit biases and that there are certain sensitivities that people are not aware of for a lot of different communities and populations—the better we can serve these groups,” added Bordenick, underscoring the importance of customized health services and interventions.

Mapping resources to communities based on SDOH data could seem like a daunting task, but many state and payer-level organizations are supporting programs aimed at helping connect people to these resources. “There are groups that are actually running algorithms and doing analytics to identify people that have food insecurity issues, who are at risk for COVID-19, or are at risk for heart disease or other conditions,” said Bordenick. “This work is happening all around us. You don’t have to start from scratch. You probably just need to connect to a program that’s in your area.” Federal food assistance programs, including the Supplemental Nutrition Assistance Program; the Special Supplemental Nutrition Program for Women, Infants, and Children; and Child Nutrition Programs are intended to reduce food insecurity in the United States, as are other regional and state-level services.

It is important to note that these federal food assistance programs are informed by recommendations, such as the 2015-2020 Dietary Guidelines for Americans, which often lack cultural appropriateness and may not resonate with many Black, Latino, Asian, and Native American consumers. According to the Academy Brief, “The lack of culturally appropriate Dietary Guidelines affects food assistance programs, making it more challenging for food insecure populations to improve their intake.”

TAKE ACTION TO ADDRESS SDOH

Simply promoting healthy lifestyle choices will not eliminate health disparities. Instead, individual nutrition and dietetics practitioners, along with the Academy, public health organizations, and other partners in the areas of education, transportation, and housing, are encouraged to take action to support culturally appropriate programs that reduce health inequity.

The Academy’s recommendations to address health disparities that are a result of SDOH align with the measures featured in President Biden’s Executive Order on racial equity, signed January 26, 2021, which addresses access to health care and other areas of concern. According to the Brief, “the Academy advocates for a broad range of policies to target social determinants of health and address these racial and ethnic health disparities, including economic stability and access to healthful food, adequate access to health care and reducing barriers to education.”

CONCLUSIONS

SDOH are the personal, social, economic, and environmental factors that influence health status and outcomes and are a driving factor of health inequities. The Academy supports investigating the root causes of health disparities by examining the SDOH, which often play a role in the etiology and amplification of chronic disease.

“I see addressing the social determinants of health as a critical issue for the Academy and something that has to be addressed for us to achieve our overall vision,” said Cox. “And the [Academy’s] vision, of course, is a world where all people thrive through the transformative power of food and nutrition.”

“For too long, I think when we talked about health care, we were focused on what was happening in clinicians’ offices, but health really begins in our homes, in our neighborhoods, in our schools, in our communities, and in our workplaces,” said Bordenick. “Where you’re born, where you grow up, where you live, where you work, your age, your race, your ethnicity—all of those things influence your health. Social determinants of health are all of those personal, social and economic factors that really influence you.”

By cultivating an understanding of SDOH and developing ethically responsible best practices for the use of health data, innovative care delivery strategies can be employed to improve the health and quality of life for a community’s most underserved populations.

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The Role of Inpatient Malnutrition Care to Address Health Disparities among Older Adults

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MALNUTRITION REFERS TO deficiencies, excesses, and imbalances in the intake of nutrients over prolonged periods of time, resulting in loss of fat stores, muscle wasting, or the overall inability to maintain essential body functions. Malnutrition is a complex and burdensome condition, often associated with higher rates of postoperative complications, mortality, and lengths of stay. Fewer than half of older adults meet the Dietary Guidelines for Americans.

The burden of malnutrition, although prevalent across all backgrounds and settings, disproportionately affects subpopulations, including underserved groups and older adults. Malnutrition occurs more frequently among non-Hispanic Black, Hispanic, low-income, and rural households. Systematic reviews have found an association between malnutrition and unfavorable clinical outcomes (eg, hospital mortality and length of stay). Malnutrition interventions initiated in inpatient settings are associated with decreased mortality risk, length of stay, and readmission rates, and increased quality of life.

Among older adults, malnutrition risk factors include the presence of comorbid conditions, lower income, functional limitations and/or disabilities, and dining alone. Food insecurity (or the inability to acquire enough food to meet the needs of all household members) is a related yet distinct issue that disproportionately affects vulnerable populations.

The rate of food insecurity in Black, Hispanic or Latino, and Native American households is approximately twice the rate in White households. Female-headed households also report higher food insecurity compared with the national average. Because dietary patterns in households with food insecurity can lead to nutritional deficiencies (ie, inadequate vitamins, minerals, and macronutrients), it is a particularly high-risk factor for malnutrition. Therefore, ensuring equitable access to nutritious food and malnutrition care—particularly in underserved communities—can be critical for addressing health disparities.

Timely identification of malnutrition risk, which can be supported by use of the quality measures developed through the Malnutrition Quality Improvement Initiative (MQii), can help to improve identification and diagnosis of malnutrition and the related issue of food insecurity that influence overall well-being, enabling more timely and comprehensive interventions to address these disparities. This article presents MQii-based examples of the relationship between malnutrition and health disparities and offers implications for clinical nutrition practice.

MALNUTRITION’S INFLUENCE ON CLINICAL OUTCOMES FOR OLDER ADULTS

Malnutrition can have many deleterious effects on health status, including diminished mental capacity and adverse physiological function. Although malnutrition affects more than 30% of hospitalized patients, only 9% of discharged patients had documentation of a malnutrition diagnosis code in 2018. According to Guenter and colleagues, unaddressed malnutrition (whether unidentified or untreated) can worsen health outcomes and increase risk of readmissions and costs of care. For example, clinical outcomes (eg, length of stay, hospitalization costs, readmission rates, complications, and in-hospital mortality) tend to be higher for patients with a malnutrition diagnosis compared with those without a malnutrition diagnosis.

Given that hospitalized older adults experience malnutrition at higher rates and the evidence of poorer outcomes for malnourished patients, it is critical to identify patients who are malnourished or at-risk of malnutrition in hospital settings to minimize adverse outcomes.

Opportunities to Address Disparities in Malnutrition Care

The MQii is a project of the Academy of Nutrition and Dietetics, Avalere Health, and other stakeholders who provided input through a collaborative partnership to advance malnutrition care across the nation. The MQii supports a national Learning Collaborative of more than 300 US health care institutions committed to advancing malnutrition standards of care. To accomplish this goal, hospitals have implemented a combination of electronic clinical quality measures to track and monitor care for older adults in inpatient settings, and complementary process improvement initiatives.

Quality measures serve as tools to help quantify health care processes, outcomes, patient perceptions, and organizational structures associated with the ability to provide high-quality health care. Through their use, providers can be empowered to quantify gaps in all areas of health care and to address health disparities in malnutrition care specifically.

The Global Malnutrition Composite Score is an electronic clinical quality...
measure endorsed by the National Quality Forum and adopted by the Centers for Medicare and Medicaid Services\textsuperscript{18} to identify and manage malnutrition in hospitalized adults. It is composed of four component measures related to malnutrition screening, malnutrition assessment by a registered dietitian nutritionist (RDN), malnutrition diagnosis documentation, and malnutrition care plan development to support optimal malnutrition care for adults aged 65 years and older admitted to inpatient service. Collectively, these four measures (which can also be tracked as independent measures) are intended to better identify patients who are malnourished or at risk of malnutrition, and who may also benefit from being screened for the related issue of food insecurity.

An analysis of 2019 MQii Learning Collaborative data revealed disparities in the burden of malnutrition across different racial and ethnic groups as identified by RDNs (Figure 1). These findings align with prevalence rates in other literature that indicate higher rates of malnutrition among the Black population (Figure 1).\textsuperscript{19}

In addition, the readmission rate for non-Hispanic Black individuals with malnutrition was more than 26%, compared with <19% among non-Hispanic White individuals (Figure 2). In another study, Basu and colleagues\textsuperscript{20} found that disparities in readmissions rates by race/ethnicity were affected by patients’ type of insurance coverage. Notably, uninsured minority populations had a slightly lower risk of readmissions compared to privately insured or Medicare patients of any race.

In addition to racial and ethnic disparities, MQii data also revealed lower measure component performance scores in rural hospitals compared to urban hospitals (Figure 3). On average, rural hospitals performed lower than urban hospitals on three out of four component measures (particularly for conducting nutrition assessments and documenting a care plan for those identified as malnourished) (unpublished data).

The performance differences may be attributed to lower access to providers in rural settings (ie, fewer RDNs to provide care). Without access to RDNs, and with a growing rate of rural hospital closures, rural residents may be less aware of the importance of nutrition to promote optimal health.\textsuperscript{21} Less exposure to RDNs may also limit identification of beneficial services that could meet people’s needs related to malnutrition and food insecurity. Moreover, older adults may have fewer opportunities for social interaction in rural areas, which often influence emotional well-being and physical health.\textsuperscript{22} Loss of appetite and impaired self-care, which are common symptoms of depression, have been found to affect nutritional status.\textsuperscript{23}

![Figure 1. Malnutrition identification rate by registered dietitian nutritionists (RDNs) in acute care hospitals, stratified by patient race/ethnicity, in 2019.](image1)

![Figure 2. 2019 Hospital readmissions for patients with malnutrition, stratified by race/ethnicity.](image2)

**THE ROLE OF QUALITY MEASUREMENT IN ALLEVIATING MALNUTRITION AND ADDRESSING HEALTH DISPARITIES**

As shown by the MQii Learning Collaborative, implementing a standardized approach to optimize malnutrition care in hospital settings provides an important opportunity to address health disparities in malnutrition care. Hospitals have many opportunities to address malnutrition through patient and provider education, quality improvement initiatives, and quality measurement. Advantages of utilizing malnutrition-focused quality measures in the inpatient setting have included increased rates of:

- identification of patients with malnutrition risk who may require additional screening for food insecurity;
- provision of early and effective interventions for patients with malnutrition and food insecurity;
- documentation of provider concerns regarding malnutrition and food insecurity for transmission to the next-in-line provider(s); and
- referral for additional evaluation by an RDN and connection to resources—such as prescriptions for food pharmacies (or referral-based programs to increase access to healthy foods), home-delivered meals, and connection to community-based organizations that address food and nutrition needs—after discharge.

Regular measurement of variables reflecting the quality of malnutrition care can also help to minimize unnecessary care and improve treatment for patients who may otherwise experience worse outcomes in the case that their malnutrition was not identified.
RURAL

PRACTICE APPLICATIONS

status).25 (such as education and socioeconomic based on social determinants of health for the most vulnerable populations optimal health, with special attention underlying commitment to strive for through their malnutrition care pro-
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cesses. Health equity refers to the un-
derlying commitment to strive for
justice and fairness in accessing optimal health, with special attention for the most vulnerable populations based on social determinants of health (such as education and socioeconomic status).25

The first example is WellStar Health System, the largest health care system with 34 locations in Georgia with a mission to “enhance the health and well-being of every person we serve” and ultimately work to close the gap of health inequities, such as access to health care and nutritious food. WellStar Kennestone utilizes video chat technology for translation services and ensures that patients who are hard of hearing have access to visual services while keeping patients safe and distanced during the coronavirus disease 2019 (COVID-19) pandemic. As part of its commitment to equitable treatment, WellStar offers kosher, halal, vegan, and vegetarian options to respect religious practices and personal preferences. Implementing and tracking malnutrition-focused quality measures in the hospital can lead to reduced disparities in accessing nutritious foods and health care services following discharge (see Figure 4).

University of North Carolina at Chapel Hill (UNC Health) is the second example of advancing health equity through malnutrition care (see Figure 5). UNC Health has created initiatives to execute its broader mission of addressing food insecurity to make nutrition and health services more accessible to all people in their community. During inpatient admissions at UNC Medical Center, clinical teams screen all patients for food insecurity using the Hunger Vital Sign screening tool.26 RDNs and nutrition and dietetic technicians, registered, connect with local programs to verify up-to-date operational and contact information about local social services and food resource programs. The handouts include food pantries, meal service programs, and community kitchens where hot meals are served. The resources explain how to apply for federal nutrition programs and RDNs offer them to all patients with food insecurity.

The success of these hospitals’ comprehensive, patient-centered programs demonstrates the benefits of identifying risk early and providing coordi-
nated care. They further address upstream social risk factors (ie, macro-
level factors that influence health and health systems, policies, and social, physical, economics, and environmental factors) to improve health outcomes.27

Expanded Malnutrition Care in Acute Care Settings Helps Address Food Insecurity

A standardized care process for malnutrition in acute care settings addresses the significant clinical burden of malnutrition and can set the foundation to explore food insecurity in greater detail. Proper nutrition requires consistent access to healthy food, knowledge of and transportation to grocers and vendors, and financial resources to purchase food. This can be even more challenging for older adults, who often face mobility or cognitive challenges in the planning, acquisition, and preparation of healthy foods.9 The absence of any combination of these can contribute to food insecurity.

According to the US Department of Agriculture’s Economic Research Service, 10.5% of households were food insecure or had very low food security throughout 2020.10 Food insecurity can also contribute to obesity, diabetes, depression, and other chronic conditions, while also worsening outcomes for patients with comorbid conditions.28–30

Screening and referrals to support services addressing food insecurity can be integrated into the recommended malnutrition clinical workflow shown in Figure 6, which can be supported by use of malnutrition quality measures.

Failure to recognize malnutrition and food insecurity by providers can worsen the health and social risk factors of underserved populations and

Figure 3. 2019 Malnutrition Quality Improvement Initiative quality measure component performance, comparing rural vs urban acute care hospitals.

Figure 4. From the field.
perpetuates health inequities that affect racial and ethnic subpopulations, rural populations, and older adults. Integrating quality measurement and evidence-based malnutrition care in interdisciplinary clinical settings may promote the identification of malnutrition and food insecurity risk by food and nutrition practitioners and lead to effective treatment, ultimately improving health outcomes. Identifying food insecurity during a hospital visit grants providers an opportunity to connect patients to follow-up care in community settings (see Figure 2). Outpatient settings also benefit from nutrition-focused quality improvement programs, which have shown reductions in resource use and in cost. There is also an opportunity to encourage full utilization of community and federal nutrition support services. For example, fewer than 50% of eligible older adults are enrolled in the Supplemental Nutrition Assistance Program—the nation’s largest federal nutrition assistance program—attributed to social isolation and lack of awareness.

**Influence of COVID-19**

The imperative to address food insecurity is even stronger since the prevalence of food insecurity and its effects on malnutrition have been heightened during the COVID-19 pandemic. The pandemic has increased the burden of employment disruptions, poverty, loss of public transportation, delays in food and meal delivery, and social isolation, while disrupting access to nutritious food. For individuals infected with COVID-19, the physiological effects may further exacerbate malnutrition symptoms through inflammation and digestive complications that influence nutrient absorption. Those at higher risk for malnutrition are also more likely to be hospitalized with complications due to impaired immune function, higher risk of infection, and greater disease severity. These findings add to the evidence regarding the malnutrition-related disparities seen across different patient populations and elevate the importance of addressing them.

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**Figure 5.** From the field.

“UNC MEDICAL CENTER provides food insecure patients with supplemental food bags via an on-site food pantry program that supports all inpatient services and outpatient oncology and pediatric clinics. We connect teammates with NCCARE360, a statewide referral network that integrates healthcare and human service organizations aimed to facilitate connecting patients to community resources. We also developed a training titled Registered Dietitians Advocating Inclusion, Diversity and Equity (RD AIDE) to promote dialogues about identity and the complex ways that race affects people in healthcare settings.”

**Figure 6.** Food insecurity and malnutrition risk screening workflow.
CONCLUSIONS
As the Centers for Medicare and Medicaid Services, private payers, and other key health care stakeholders consider opportunities to address health inequities, expanding malnutrition measurement may help reveal gaps in nutrition care and provide opportunities for providers to refer their malnourished and/or food insecure patients to appropriate resources. The Global Malnutrition Composite Score can serve as an anchor for addressing disparities in acute inpatient settings by laying a foundation for multidisciplinary care teams to collect actionable data, measure progress, and direct community resources to those found to be malnourished, food insecure, or at risk for these conditions. Screening for and identifying malnutrition in the hospital can help flag individuals who may also be food insecure. Conversely, identifying food insecurity may indicate potential malnutrition due to lower consumption of foods with essential nutrients.

RDNs participating in the MQii Learning Collaborative report that they connect patients in need to community services (eg, Supplemental Nutrition Assistance Program-Education and referral-based medically tailored meal delivery). In addition, RDNs who work in these community settings also play important and direct roles in delivering needed services that help to address and/or prevent the disparities described above. RDNs throughout the United States continue to take leadership roles in identifying and managing malnutrition. Further opportunities to collaborate with community-based organizations to implement pilot studies and generate evidence about effective nutrition interventions across care transitions may also be explored to help identify and expand actionable solutions to ensure more equitable outcomes.

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