The Malnutrition Quality Improvement Initiative: A Multiyear Partnership Transforms Care

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ABSTRACT

The Academy of Nutrition and Dietetics, representing credentialed nutrition and dietetics practitioners—registered dietitian nutritionists (RDNs) and nutrition and dietetics technicians, registered, and students and interns and professionals holding nutrition and dietetics undergraduate and advanced degrees—and Avalere Health, a Washington, DC–based strategic advisory services firm, have led the charge in closing malnutrition gaps with the Malnutrition Quality Improvement Initiative (MQii), a national nutrition-focused quality improvement initiative. The initiative’s journey from 2013-2019 utilized technical advisors and stakeholders to improve care and outcomes for hospitalized adults age 65 and older with a series of innovations. These innovations include the development of the first malnutrition electronic clinical quality measures (eCQMs) and a complementary interdisciplinary quality improvement toolkit and establishing the first nutrition-focused national Learning Collaborative. MQii’s vision for future directions and applications in 2020 and beyond will explore partnerships to include the malnutrition eCQM in available clinical data registries. Qualified Clinical Data Registries will provide a pathway for collecting nutrition data relevant to RDNs because as of 2020, payments for Medicare Part B nutrition services and quality improvement are available for eligible RDNs participating in the Centers for Medicare and Medicaid Services Quality Payment Program. The MQii Toolkit’s technical specification manuals, data dictionaries, and implementation guides will help RDNs integrate the malnutrition quality measures into existing electronic health records and lead nutrition data collection and analysis. RDNs’ continued advancement with information technology leaders to incorporate terminology and clinical standards into electronic health record platforms will provide for malnutrition data transfer across care settings.

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Although malnutrition is an underlying condition present upon admission in as many as 50% of hospitalized patients, only 8% receive a medical diagnosis of malnutrition during their hospital stay. This can have significant ramifications on patient outcomes and costs not only in the hospital but upon discharge to home or post–acute care setting. A 2016 analysis showed that hospitalized malnourished patients were found to have up to a four times increase in mortality and a greater than 50% increase in readmissions when compared with well-nourished patients. Suboptimal malnutrition care can also lead to complications and patient safety risks resulting in higher incidence of falls, pressure injuries or ulcers, and infections and increased unplanned hospitalizations and/or readmissions, thus accounting for an annual US economic burden of $157 billion, $51.3 billion of which is directly associated with older adults.

Although evidence has consistently shown that high-quality malnutrition care leads to better patient outcomes and reduced health care costs, to date no malnutrition-focused quality measures have been included in public or private quality incentive programs or payment models. With an increasingly aging population in the United States and a focus on shifting health care payments from volume to value, there is a significant opportunity to close these gap areas and to adopt clinically relevant malnutrition-related measures that will provide real-time, actionable, and meaningful data for clinical decision making.

In collaboration with technical advisors and other stakeholders, the Academy of Nutrition and Dietetics (Academy), representing credentialed nutrition and dietetics practitioners—registered dietitian nutritionists (RDNs) and nutrition and dietetics technicians, registered, and students and interns and professionals holding nutrition and dietetics undergraduate and advanced degrees—and Avalere Health, a Washington, DC–based strategic advisory services firm, have led the charge in closing these gaps with the Malnutrition Quality Improvement Initiative (MQii), a national nutrition-focused quality improvement initiative. The following narrative outlines the initiative’s collaborative journey from 2013-2019 to improve care and outcomes for hospitalized adults age 65 and older with a series of nutrition-focused quality improvement (QI) innovations. These innovations include the development of the first malnutrition electronic clinical quality measures (eCQMs), a complementary interdisciplinary quality improvement toolkit, and establishing the first nutrition-focused national Learning Collaborative.
MQii was established to: advisors, and other stakeholders, the collaboration with technical experts, aged 65 years and older (Figure 1). In solution targeting adults who are Avalere Health to develop and launch a nosis, and treatment). (timely screening, assessment, diag-

implement optimal malnutrition care. It has been well established that malnutrition or risk of malnutrition should be addressed as early as possible during the hospital admission to ensure that all of the medical, psychological, and functional factors related to malnutrition can be addressed in a timely manner to optimize patient outcomes. Furthermore, there is opportunity to enhance physician and interdisciplinary team knowledge and provide hospitals with the necessary tools to effectively address high rates of malnutrition and implement optimal malnutrition care (timely screening, assessment, diagnosis, and treatment).

In 2013, the Academy partnered with Avalere Health to develop and launch a stakeholder-driven, evidence-based solution targeting adults who are malnourished or at risk of malnutrition aged 65 years and older (Figure 1). In collaboration with technical experts, advisors, and other stakeholders, the MQii was established to:

- improve effectiveness and timeliness of malnutrition care through a toolkit for use by an interdisciplinary team;
- advance the adoption of malnutrition eCQMs “that matter” to help improve outcomes that are important to patients and clinicians; and
- expand availability of tools that can be integrated into electronic health record (EHR) systems to improve care quality and documentation while minimizing administrative burden.

**DEVELOPING THE FIRST MALNUTRITION QUALITY MEASURES**

In 2015, with the guidance of a Technical Expert Panel, the Academy of Nutrition and Dietetics and Avalere Health (the Partnership) developed and tested the first set of four malnutrition eCQMs to help hospitals demonstrate that attaining nutrition standards of care can be validly, reliably, and feasibly accomplished while simultaneously identifying additional areas for improvement. Since then, a global composite measure has also been developed and tested. The composite measure encompasses the components of the previously mentioned four individual malnutrition eCQMs as steps in obtaining a score.

The individual malnutrition eCQMs are currently being used by hospitals across the country in QI initiatives. All four eCQMs have been submitted to the National Quality Forum for endorsement and to the Centers for Medicare and Medicaid Services (CMS) for inclusion into the Hospital Inpatient Quality Reporting Program. In 2016, the four individual eCQMs were included in the CMS Measures Under Consideration List; despite the groundswell of support among the stakeholder community, to date the measures have not been adopted for public quality reporting in the Hospital Inpatient Quality Reporting Program.

Based upon input from a diverse set of national stakeholders representing providers, hospitals, payers, patients, and policy makers, coupled with the desire to ground the initiative in the basic tenets of QI, the Partnership is establishing a novel dual-pronged approach to support achieving malnutrition standards of care (see Figure 2). This team-based model, a symbiotic relationship of measuring and improving, not only relies on this set of valid, reliable quality measures but also provides tools to facilitate and achieve optimal results.

**DISSEMINATING TOOLS AND RESOURCES TO ACCELERATE MALNUTRITION QUALITY IMPROVEMENT**

As a complementary component of the dual-pronged approach, the Partnership also developed and tested a web-based MQii Toolkit in 2015 to advance the use of best practices for malnutrition care in a timely and effective manner, elevate the role of the care team, and enhance physician and interdisciplinary team knowledge about optimal standards of care. The MQii Toolkit’s set of resources to support early identification, assessment, and intervention of patients was created to advance malnutrition quality of care in the acute care setting, recognizing that a set of measures without supporting information would not be sufficient. At its core, the MQii Toolkit is a web-based collection of evidence-based malnutrition care best practices and resources and offers guidance for QI. It was designed as a “living document” and was targeted for use by the entire interdisciplinary team (eg, dietitians, physicians, nurses, patients, and caregivers). Given the vision of being a more patient-centered resource, there are plans to continue to enhance the content thus making it more relevant for patients and caregivers. To date, the Toolkit not only has been adopted by US-based hospitals participating in the MQii Learning Collaborative, but has been adapted for use in the United Kingdom’s National Health Service, a testament to the utility of the information and resources included to advance the quality of malnutrition care everywhere.

More specifically, the Toolkit has three main objectives: (1) to “support health care institutions in achieving malnutrition standards of care”; (2) to “advance the adoption of malnutrition best practices at health care institutions”; and (3) to “improve nutrition risk identification and care as patients transition across care settings.” The Toolkit offers many implementation resources such as how to solicit leadership buy-in, identify a quality improvement project, understand best practices for quality malnutrition care, use tools to support education and training, and track changes in care with data management.

As with the quality measures, the Partnership sought to evaluate the feasibility and impact of the MQii Toolkit to ultimately enhance its adoption into practice. In 2016, a pilot demonstration at Vanderbilt University Medical Center was implemented. This pilot demonstrated that introducing an interdisciplinary toolkit could reduce variation in malnutrition care practices.
The Accomplishments of the MQii were Born Out of a Multi-Year Partnership Between Academy, Avalere and Abbott Nutrition

The partnership began in 2013 with the goal of improving malnutrition care for hospitalized elderly

**Phase I (2013)**
- Identify existing gaps in evidence & measurement
- Engage with key stakeholders (e.g., CMS) to discuss care barriers

**Phase II (2014)**
- Conduct malnutrition best practices research in acute care settings
- Hold two national dialogues to identify opportunities for optimal malnutrition care

**Phase III (2015)**
- Launch and implement the “Malnutrition Quality Improvement Initiative” (including eCQMs testing and in-hospital demonstration)

**Phase IV (2016-2018)**
- Continue stakeholder engagement
- Expand use of the Toolkit in more hospitals
- Build consensus-based National Blueprint for Malnutrition Care Across Care Continuum

**Phase V (2019+)**
- Support uptake and adoption of Hospital eCQMs
- Launch a National Learning Health System
- Extend malnutrition quality into transitions of care

**Goals**
- Opportunity to expand adoption of eMeasures across other care settings & populations
- Secure national measures into core datasets
- Expand MQii model to other patient populations

CMS: Centers for Medicare & Medicaid Services; eCQMs: electronic clinical quality measures; DMT: Defeat Malnutrition Today; NQF: National Quality Forum

**Figure 1.** Timeline of Malnutrition Quality Improvement Initiative (MQii) Partnership: 2013 to present.
and advance evidence-based standards and best practices for hospitalized adults. At the end of the pilot, Vanderbilt University Medical Center observed a statistically significant reduction in length of stay among malnourished patients, a decrease in time from positive screening to nutrition interventions, and an increase in rate of physician documentation of medical diagnoses of malnutrition, among other key indicators.8

As the Partnership sought to further raise awareness of malnutrition among hospitalized elderly as a national problem, implement evidence-based solutions, and blanket the health policy landscape with robust clinical quality measures that centrally addressed the population of interest, the need to support the acceleration and dissemination of malnutrition care best practices for both patients and providers was identified.

**ESTABLISHING THE FIRST NUTRITION-FOCUSED NATIONAL LEARNING COLLABORATIVE**

To encourage adoption and use of the malnutrition measures and MQii Toolkit in practice, the Partnership strategically undertook multiple strategies, relying on the shifting value-based reimbursement landscape as a lever. The Partnership also committed to establishing the first national nutrition-focused learning collaborative to further raise awareness and build an infrastructure for ongoing quality measurement and improvement.

In 2016, the Partnership launched the MQii Learning Collaborative with six hospitals, initially focused on providing feedback on the use of the Toolkit. By 2017, the Learning Collaborative grew to 50 hospitals participating and performing malnutrition quality improvement projects, including some using the eCQMs.9 To date, over 268 hospitals are enrolled across numerous health systems varying in facility size, geographic region, and demographic distribution, 89 of which are submitting data. The distribution across the United States is depicted in Figure 3.

To accommodate varying levels of site preparedness for this type of quality improvement initiative, the Partnership established a two-tiered system of enrollment. Tier 1 sites implement a malnutrition quality improvement project, submit eCQM data for performance calculation and benchmarking, and receive benchmark feedback reports, whereas Tier 2 sites concentrate on implementing a...
malnutrition quality improvement project and establishing an infrastructure supportive of quality improvement. This two-tier approach allows for a consistent application of nutrition standards of care within sites and an improved probability of identifying malnourished patients. Those hospitals participating in data collection support the MQii “Data Hub,” a data repository that contained over 300,900 patient records at the end of 2018 and continues to grow. Such data are being used to assess the gaps in malnutrition care among hospitalized elderly in the United States, highlight opportunities to improve patient care overall, and most importantly serve as the substrate to support the development and testing of future quality measures for other patient populations and beyond the hospital setting.

Organizations that undertake an MQii project have the opportunity to pursue malnutrition-focused quality improvement, transform quality and performance of malnutrition care delivery, and implement evidence-based, high-quality, patient-/client-driven malnutrition care.7 Learning Collaborative participants also receive start-to-finish guidance for their MQii project. Guidance includes how to obtain senior leadership support and engagement, establish and maintain interdisciplinary teams, map workflow and identify a quality improvement focus area(s), and collect data, measure performance, and evaluate results.6

**FUTURE DIRECTIONS AND APPLICATIONS FOR THE MQII IN 2020 AND BEYOND**

Early results from the Learning Collaborative demonstrate that hospital teams implementing the MQii can improve timely identification, quality of care, and treatment of hospitalized older adults who are malnourished or at risk of malnutrition. In 2013, collecting malnutrition-related data in the EHR was rare and unreliable; now, in 2019, collecting malnutrition-related data is feasible, valid, and reliable. Hospital teams are using the MQii Toolkit to implement optimal standards of care and collect and analyze data with the malnutrition eCQMs to demonstrate their success in meeting these standards and improving outcomes that matter to patients and clinicians. RDNs and interdisciplinary team colleagues have served as leaders of change in this implementation process, and there is now an opportunity to expand this leadership into transitions of care process and planning, implement the MQii model with other patient populations and care settings, and secure nutrition quality measures in core data sets and registries.

**LEAD IN TRANSITIONS OF CARE**

Transitional care encompasses a broad range of services and environments including post-acute care settings: rehabilitation, skilled and long-term care facilities, the patient’s home, and primary and specialty care medical practices.10 Often as patients transition from one point of care to another,
nutrition status is not evaluated, documented, or included in discharge planning documents or conversations. Better integration of malnutrition care into transitions of care is a necessary next step to ensure continuity of care and to prevent negative health and financial outcomes for older adults in post-acute care settings.

Pilot studies are under development to implement and test real-world solutions for better integrating nutrition risk identification and care into care transition pathways, specialty care, and accountable care models. With input from key stakeholders and advisors, the MQii teams have identified a significant opportunity for 2020 and beyond to include ongoing hospital adoption, initiating post-acute care settings adoption and primary care physicians’ and interdisciplinary colleagues’ adoption of nutrition-focused standards of care and best practices.9 Quality of care and will be positively impacted as malnutrition care is integrated for patients being discharged from the hospital, along with improved recognition and management of a patient’s nutrition risk as a component of chronic disease management in the community setting.

EXPAND THE MQII MODEL TO OTHER PATIENT POPULATIONS AND CARE SETTINGS

Adults 65 and older have been the primary population of focus for MQii since its launch. The eCQMs and MQii Toolkit enhance the ability of interdisciplinary teams to identify and diagnose malnutrition for older adults in the hospital setting. In addition, the eCQMs support integration of essential nutrition elements into care plans to improve quality of care and ultimately patient outcomes. As Learning Collaborative hospitals have successfully implemented MQii focused to older adults, there is an opportunity to expand improved nutrition quality of care to additional patient populations. This approach allowed for a consistent application of nutrition standards of care within sites and an improved probability of identifying malnourished patients. Of note, some Learning Collaborative sites elected to apply the eCQMs to all adult admissions (18 years and older) once the eCQMs became part of the EHR. Beyond adult populations, leaders in Academy diestetic practice groups, such as the Pediatric Nutrition Practice Group, are considering the application of MQii to pediatric patients. Just as with older adults, there is a gap between estimated prevalence and documented diagnosis of malnutrition in hospitalized pediatric patients. A recent study reported that of 2.1 million children hospitalized annually in the United States, only 54,600 were diagnosed with malnutrition, suggesting a prevalence of 2.6%.11 There is a need to consider how the eCQMs and Toolkit can be adapted, adopted, and implemented in the pediatric population.

The MQii could also be an effective approach to improve outcomes in surgical patients by strengthening nutrition components of Enhanced Recovery After Surgery (ERAS) protocols.12 ERAS protocols are multimodal perioperative care pathways for patients undergoing specific types of surgical procedures. Nutrition plays a key role in ERAS protocols, which include preoperative counseling, preoperative nutrition, and avoidance of perioperative fasting.13 Integrating aspects of MQii into ERAS protocols could positively impact length of stay and overall cost of care for surgical patients.

SECURE NUTRITION QUALITY MEASURES IN CORE DATA SETS AND REGISTRIES

The data generated through the MQii process in the aggregate, and at the site level, have generated powerful learning opportunities and served as a catalyst for discussions about the essential role of nutrition in improving quality of care. As 2020 approaches, data collection and analysis will continue, and results will be disseminated to accelerate uptake and adoption of best practices to improve care and health outcomes for hospitalized adults age 65 and older that are malnourished or at risk for malnutrition.

The Academy is currently exploring partnerships to include the malnutrition eCQMs in available clinical data registries. As of 2020, Qualified Clinical Data Registries are particularly relevant to RDNs because payments for Medicare Part B nutrition services and QI are available for eligible outpatient RDNs who participate in the CMS Quality Payment Program. Qualified Clinical Data Registries provide a pathway for collecting nutrition data and participating in the CMS Quality Payment Program. Including the malnutrition eCQMs in clinical data registries will help expand adoption across multiple care settings beyond the hospital and by physicians and non-physician practitioners.

Furthermore, the MQii Toolkit includes technical specification manuals, data dictionaries, and implementation guides to help RDNs and their hospital information technology teams integrate the malnutrition quality measures into existing EHRs. Templates are also available to assist with including the eCQMs in standard EHR packages. As RDNs continue to lead nutrition data collection and analysis, there is a need to collaborate with information technology and EHR leaders to integrate standardized malnutrition terminology and clinical standards into standard EHR platforms to improve malnutrition risk identification and data transfer across care settings. Expanding the use of EHR tools (e.g., alerts, hard stops) and visibility of nutrition information in EHRs will help enhance nutrition-related decisions and communicate nutrition information to applicable physicians and non-physician practitioners. There is also an emerging need to identify mechanisms to share relevant social determinants of health-related data (i.e., employment, income, housing, transportation, literacy, language, hunger, access to healthy options) in a manner that is compliant with regulatory requirements and supports the patient, family, and caregiver ability to maintain and improve patients’ nutrition status.

MQii has transformed the way nutrition care is conducted in the hospital acute care setting. At the same time, it has allowed the interdisciplinary team to reenvision the role of the RDN in leading malnutrition care. By way of QI and measures, malnutrition identification and treatment have moved from dialogue to meaningful action. Expanding the MQii model into transitions of care and other patient population settings (i.e., post-acute and long-term care) further positions MQii to address malnutrition at a systems-level approach. Securing and integrating the eCQMs into a Qualified Clinical Data Registry allows for
seamless care coordination and strengthens RDN leadership in community and primary care.

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. S. M. McCauley is an employee of the Academy of Nutrition and Dietetics. K. Mitchell is an employee of Avalere Health. A. Heap is an employee of Abbott Nutrition Division of Abbott.

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AUTHOR CONTRIBUTIONS
S. M. McCauley developed the outline for the manuscript. S. M. McCauley, K. Mitchell, and A. Heap developed the first draft of the manuscript. All authors reviewed and commented on subsequent drafts of the manuscript.