

Feedback from the Frontline and Best Practices: The Challenges and Impact of COVID-19 on Malnutrition Care in Hospitalized Patients

Mary Beth Arensberg, PhD, RDN, LDN, FAND^{1*}, Cory Brunton, MS, BSN, RN²,
Wendy Everett ScD³, Sharon M. McCauley, MS, MBA, RDN, LDN, FADA, FAND⁴

¹Abbott Nutrition Division of Abbott, Columbus, Ohio, 43219 USA, 614-624-3948, mary.arenberg@abbott.com

²Abbott Nutrition Division of Abbott, Columbus, Ohio, 43219 USA, 614-203-1865, cory.brunton@abbott.com

³Avalere Health, Washington DC, 20005 USA, 415-860-7790, weverett@nehi.net

⁴Academy of Nutrition and Dietetics, Chicago, Illinois, 60606 USA, 312-899-4823, smccauley@eatright.org

*Corresponding Author: Mary Beth Arensberg PhD, RDN, LDN, FAND, Director, Health Policy and Programs, Abbott Nutrition Division of Abbott, Columbus, Ohio, USA, Phone: 1-614-624-3948, FAX: 1-614-727-3948, Email: mary.arenberg@abbott.com

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Abstract

Malnutrition, particularly protein-calorie malnutrition, among hospitalized patients has long remained a challenge. With the SARS-CoV-2 virus triggering the COVID-19 pandemic, the risk for malnutrition and its impacts may be even more pronounced. A recent evaluation of older patients admitted to the hospital with COVID-19 in Wuhan, China, identified that 52.7% were malnourished and 27.5% were at risk of malnutrition. The few available articles that address supportive care for patients with COVID-19 recommend evaluating the nutrition status of all infected patients at hospital admission and providing nutrition support as early as possible to those identified at risk. Similar recommendations are made by nutrition organizations that have published clinical guidance and best practices for nutrition care of patients with COVID-19. The Malnutrition Quality Improvement Initiative (MQii) works to help hospitals and health systems improve malnutrition care and achieve better outcomes. The MQii has also established a Learning Collaborative of United States hospitals to support acceleration and dissemination of malnutrition care best practices and thus provides an opportunity to examine how COVID-19 has changed malnutrition identification and care of hospitalized patients. In this Commentary, malnutrition is described in the context of COVID-19. In addition, a summary of challenges and solutions for providing malnutrition care to hospitalized COVID-19 patients is described, based on reports from 17 registered dietitian nutritionists (RDNs) working in MQii Learning Collaborative institutions. Limitations in staffing, product and equipment shortages, and restricted patient access were among the common challenges recounted. Implications for hospital practice changes in malnutrition care included the need for an interdisciplinary approach, active patient and family engagement, early nutrition intervention protocols, flexibility in accomplishing nutrition goals, and leveraging health information technology. Drawing on the reported experiences of RDNs in MQii Learning Collaborative hospitals and other clinicians it is possible to identify potential hospital practice changes and opportunities for healthcare delivery systems to help promote and better prepare for delivering quality malnutrition care to COVID-19 patients.

Keywords and Abbreviations: SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2; COVID-19: Coronavirus Disease; Malnutrition; Hospital and Acute Care; RDNs: Registered Dietitian Nutritionists; MQii: Malnutrition Quality Improvement Initiative; Challenges and Solutions for Malnutrition Care

Introduction

Malnutrition among hospitalized patients has long remained a challenge. Up to 50% of patients are reported at risk for or are malnourished upon hospital admission [1] and evidence shows that malnourished patients have increased hospital stays, readmissions, and healthcare costs [2]. With the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus triggering the coronavirus disease (COVID-19) pandemic, the risk for malnutrition and its impacts may be even more pronounced, especially as both hospital and critical care admissions have increased during the pandemic.

The Malnutrition Quality Improvement Initiative (MQii) works to help hospitals and health systems improve malnutrition care and achieve better outcomes. It was launched in 2013, by the Academy of Nutrition and Dietetics (Academy), Avalere Health, and other stakeholders and has established a Learning Collaborative of more than 280 United States (US) hospitals to support acceleration and dissemination of malnutrition care best practices. In this Commentary, malnutrition is described in the context of COVID-19, as well as how MQii Learning Collaborative institutions report COVID-19 is impacting the provision of malnutrition care in their hospitals and potential future implications for healthcare delivery systems.

Malnutrition and COVID-19

Malnutrition is most often defined as protein-calorie malnutrition and older patients are particularly at risk. Tao et al in a recent evaluation of older patients admitted to the hospital with COVID-19 in Wuhan, China, used the Mini Nutrition Assessment (MNA) to identify that startlingly 52.7% were malnourished (MNA score <17 points) and 27.5% were at risk of malnutrition (MNA score 17-23.5 points). To complete the MNA, anthropometric measures were taken by a trained medical graduate and questionnaire assessments were completed through face-to-face interviews performed by staff trained in formal nutrition surveys. The researchers postulated several potential causes of the high incidence of malnutrition, including increased need for protein as a result of acute inflammatory response, diabetes as a comorbidity, gastrointestinal symptoms resulting from COVID-19, and poor appetite related to overall patient anxiety [3]. Others have commented that poor appetite may result in part from the gastrointestinal symptoms (including nausea, vomiting, and diarrhea) that appear to be more frequent in patients with severe COVID-19 [4,5].

It has also been identified that most patients admitted to intensive care with COVID-19 are acutely malnourished [6] and that inadequate protein and energy intake are likely in patients receiving noninvasive ventilation [7], a frequent treatment for more severe COVID-19 cases. In addition, there is overlap between the specific chronic conditions identified as risks for severe illness from COVID-19 [8] and those associated with disease-related malnutrition [9], including chronic kidney disease, chronic obstructive pulmonary disease, and serious heart conditions. These conditions could likely be stratified as COVID-19-related conditions with higher malnutrition risk.

Malnourished patients often develop medical complications that significantly impact health outcomes. A number of these complications--including immunosuppression, increased infection rates, and decreased respiratory and cardiac function--could be especially serious for patients with COVID-19. Indeed, nutrition status has been suggested as an important factor influencing the outcome of patients with COVID-19 [10]. Further, the virulence of COVID-19 may be impacted by malnutrition or its risk. Briguglio et al. describe the "disabilities of malnourished individuals during infections," commenting malnutrition affects both the innate and adaptive immune responses that should inhibit viral proliferation. They explain the basal immune dysfunction existing in protein-energy malnutrition and sarcopenic obesity could make individuals more susceptible to contracting COVID-19 and to its systemic effects [4].

The few available articles that address supportive care for patients with COVID-19 recommend evaluating the nutrition status of all infected patients at hospital admission [11] and providing nutrition support as early as possible to those identified at risk [6,11]. Mehta describes one local example as a set of prompts automatically generated on electronic COVID-19 ward round entries, that includes a screening tool score, leading on to pre-defined plans based on nutrition risk together with oral intake [12]. Similar recommendations are made by nutrition organizations that have published clinical guidance and best practices for nutrition care of patients with COVID-19, including the British Association of Parenteral and Enteral Nutrition [7], the European Society for Clinical Nutrition and Metabolism (ESPEN) [13], the American Society for Parenteral and Enteral Nutrition (ASPEN) [14], and the Academy [15]. However, it has not been reported whether such recommendations have led to higher diagnosis rates of malnutrition in patients with COVID-19.

Caccialanza et al. recently published a pragmatic early nutrition intervention protocol in pre-ICU patients with COVID-19, devised by a multidisciplinary team of experts working in Lombardy, Italy, which has been the center of the Italian COVID-19 crisis [16]. Their protocol included systematic oral supplementation with whey proteins and intravenous multivitamin/mineral/trace element solutions on hospital admission, provision of protein-calorie oral nutrition supplements (ONS) to patients identified at nutrition risk, and supplemental/total parenteral nutrition when ONS was not tolerated and/or patients' respiratory conditions worsened. In commenting on the protocol, Laviano et al. noted some of the procedures diverged from existing nutrition guidelines because of the specific clinical characteristics of COVID-19 patients and the difficulty of working in an intense infection-control environment. Further, they expressed the hope that the protocol would generate debates and possibly new proposals on how to address the clinical and organizational challenges of COVID-19 [10].

Impact of COVID-19 on Malnutrition Care Delivery

To add to the discussion of malnutrition care during the COVID-19 pandemic, on April 24, 2020, a simple set of closed and open-ended questions asking about challenges associated with providing care for these patients was emailed to 200 registered dietitian nutritionists (RDNs) who worked in hospitals participating in the MQii Learning Collaborative. Responses were anonymous, unless the RDN chose an option at the end of the questions to add his/her name (to be contacted to learn more about the questions). By May 28, 2020, responses had been received from 19 RDNs (9.5%); 17 (8.5%) of whom reported their institutions had/were providing care for patients with COVID-19. While the response rate was limited, the most common answers received (Table 1) offer insights into some of the challenges clinicians are facing and the practical solutions they have identified for continuing to provide quality malnutrition care during the COVID-19 pandemic. Response from MQii Learning Collaborative RDNs to the COVID-19 malnutrition care questions has continued to be encouraged and could provide an opportunity for further analysis.

Challenge	Description	Impact	Solutions
ICU Patients			
Product/equipment shortages	Lack of adequate tube feeding pumps, sets, formulas	Increased potential for inadequate patient feeding	<ul style="list-style-type: none"> Switched patients to gravity/bolus tube feedings Extended use of feeding sets to 48 hours to preserve equipment supplies (not recommended but necessary) Stored available tube feeding equipment in different ways to protect it from any possible COVID-19 contamination Lobbied hospital procurement to allow ordering off-formulary enteral formulas to meet increased demand for tube feeding products
	Lack of personal protective equipment (PPE)	Limited registered dietitian nutritionist (RDN) ability to go into patient rooms and complete malnutrition assessments and/or perform nutrition-focused physical exams (NFPE)	Taught physicians/nurses who had patient room access how to complete NFPEs; results used by RDNs to complete nutrition care plans
Patient access changes	Restricted access to patient rooms (to limit staff interactions with COVID-19 patients)	Limited RDN ability to complete malnutrition assessments and/or perform NFPEs	Used Microsoft Teams platform to be "present" during patient rounds (especially ICU rounds)
Patient nutrition status changes	Patients lying prone and/or intubated	Difficulty in maintaining adequate patient nutrition	No solutions suggested
	Food served cold and/or on disposable trays/plates	Diminished food quality and decreased patient appetite/food consumption	No solutions suggested
Non-ICU Patients			
Staff reductions	Lack of adequate RDN and dietary/kitchen staff because of COVID-19 exposure concerns	Reduced staff impacted ability to fully perform job functions	No solutions suggested
Patient access changes	Restricted access to patient rooms (to limit staff interactions with COVID-19 patients)	Limited RDN ability to complete malnutrition assessments and/or perform NFPEs	Interacted virtually with patients' families at home and shared information gained with care teams to inform medical and nutrition care plans
Remote work requirements	Variable access to telehealth systems among RDNs	Limited RDNs ability to see/interact with patients well enough to complete nutrition assessments and recommend nutrition care plans	Used text messaging/chat functions with physicians/nurses to share and receive patients' clinical and dietary information; enabled RDNs to stay current on patients' nutrition status and provide guidance for malnutrition care

Table 1: Summary of most common challenges and solutions for providing malnutrition care to hospitalized COVID-19 patients*

*Summary of responses from 17 (8.5%) RDNs working in US MQii Learning Collaborative hospitals

Of note, the majority of these RDNs stated that because their institutions had either discontinued or reduced nutrition-focused physical exams (NFPEs), nutrition care for non-COVID-19 patients was also impacted. Specifically, they believed there was a reduction in malnutrition diagnoses among non-COVID-19 patients.

Preparing for the Future

It is too early to know the long-term impacts of the COVID-19 pandemic on the US healthcare delivery system and on malnutrition care. However, drawing on the reported experiences of these MQii Learning Collaborative hospitals

and other clinicians it is possible to identify opportunities that may help promote quality malnutrition care and better prepare for future challenges, as described below and summarized in Table 2.

1. Plan and follow an interdisciplinary approach to malnutrition care
2. Find ways to actively engage patients and families in malnutrition care
3. Consider implementing early nutrition intervention protocols
4. Identify opportunities for flexibilities to accomplish nutrition goals
5. Explore opportunities to leverage health information technology, including telehealth

Table 2: COVID-19-related implications for hospital practice changes in malnutrition care

First, an interdisciplinary approach to malnutrition care is fundamental. The MQii framework for quality improvement is built on an interdisciplinary platform. The COVID-19 pandemic has underscored the importance of training frontline clinicians in malnutrition care. Nurses are uniquely positioned as they have been at the bedside of and provided direct care to patients during the pandemic. As the first point of contact for patients who are admitted to the hospital, nurses have generally been responsible for malnutrition screening, although limited time; competing priorities; and lack of knowledge, training, and education are potential barriers that impact malnutrition diagnosis and intervention [17]. These barriers have likely intensified with states waiving nurse-to-patient ratio laws to accommodate the influx of COVID-19 patients and it has been reported that medical and nursing teams during the pandemic have been overstretched for many other additional reasons (eg, staff shortages due to sickness or self-isolation, caseload, unfamiliar working patterns, time spent liaising with families unable to visit their loved ones or donning/doffing personal protective equipment (PPE)) [12].

Second, finding ways to engage patients and families in malnutrition care, even during a pandemic, remains important. The MQii framework is patient-centered and patient advocacy is critical to ensure patients receive safe, effective, high quality care. Malnutrition is not systematically screened for among hospital patients and is typically diagnosed in only 8% of hospitalized patients [18], even though 50% or more of hospital patients may be malnourished [12], leaving many people undiagnosed and untreated. In this pandemic, education and training on proper malnutrition screening and care (such as described in the MQii Toolkit, which includes a listing of validated malnutrition screening tools [19]) is more essential than ever for all members of the patient care team and engaging the family is especially necessary for COVID-19 patients transitioning from the hospital to home. Previous research with patients who were malnourished/at risk for malnutrition and had various health conditions has documented the effectiveness of patient and family education on nutrition interventions as a part of transition of care and outpatient care plans [20]. ASPEN's guidance [21] and fast facts [22] on nutrition and hydration for patients with COVID-19 recovering at home may be helpful resources for transition of care and home care nutrition plans.

Third, early nutrition intervention protocols can lead to clinical and economic benefits when staff resources and patient access are limited. RDNs participating in the MQii Learning Collaborative reported that lack of staff and patient access restricted their ability to perform nutrition assessments and develop nutrition care plans, even for non-COVID-19 patients. Caccialanza et al. also documented staff shortages and the need to reduce contact with COVID-19 patients as challenges. However, in Italy, the clinicians rapidly implemented a pragmatic protocol for early nutrition supplementation of non-ICU patients with COVID-19 [16]. Similarly, other researchers, in the pre-COVID-19 era, have reported on the success of early nutrition interventions as part of hospital-based quality improvement programs (QIPs) [23,24]. One of the largest nutrition-focused QIPs that included systematic nutrition risk screening, early nutrition intervention with ONS, and patient and caregiver nutrition education was associated with a 26% (or 1.9 day) reduction in length of hospital stay and a 29% reduction in 30-day readmissions for hospitalized at-risk/malnourished patients [23]. These improvements resulted in total cost savings of more than \$4.8 million over a 6-month period [25], supporting the importance of optimized nutrition care in improving quality of care at a reduced cost. Further, a recent economic analysis has suggested that the use of advanced enteral nutrition formula in a sepsis population could save at least \$52 million annually [26]. As COVID-19 places a significant economic burden on the US healthcare system and society at large, it will likely continue to accelerate the importance of quality and value. To ease the economic burden in the aftermath of the COVID-19 pandemic, early nutrition intervention programs are a strategy worth implementing.

Fourth, identifying opportunities for new and flexible ways to accomplish nutrition goals may help alleviate shortages and reduce the potential impact of COVID-19 on malnutrition risk. The MQii Learning Collaborative RDNs reported several solutions to deal with shortages of tube feeding equipment, supplies, and formulas, but did not offer any specific suggestions to address changes in patient nutrition status or staffing shortages. Caccialanza et al. observed that almost all hospitalized COVID-19 patients "present at admission with severe inflammation and anorexia leading to a

major reduction of food intake,” and this was the impetus for the development of their early nutrition supplementation protocol [16]. Such a solution may be helpful to other clinicians, as well. Mulherin et al. characterized a number of nutrition care issues and process changes that have occurred with the COVID-19 pandemic, such as limited ability to complete NFPEs, patient interactions by video chats or telephone, participating in rounds via video conferencing, and delays in placing percutaneous endoscopic gastrostomy tubes and in replacing gastrostomy/jejunostomy tubes for tube feeding [27]. In addition, health professional organizations including the Academy [28] and ASPEN [29] have developed professional resource hubs that are frequently updated and provide written resources, question and answer documents, and webinars on issues specific to COVID-19. Other examples of COVID-19 resources can be found on the MQii [30], Defeat Malnutrition Today coalition [31], and Abbott Nutrition Health Institute [32] websites.

Finally, exploring opportunities to leverage health information technology—specifically telehealth—will be very important to improving malnutrition care. There are a number of telehealth services that could support malnutrition care, including routine screening appointments and check-ins, self-care management training, discharge planning, and new/established home visit patient appointments. The Academy launched its Telehealth Quick Guide for RDNs to practice via telehealth during the COVID-19 pandemic [33]. Increased use of technology was also a common theme in the MQii Learning Collaborative responses. Those RDNs with access to telehealth technologies have been able to continue to deliver malnutrition care during the COVID-19 pandemic, communicating either directly with patients and families or through teamwork with nurses and physicians at the bedside. Mulherin et al. also identified use of telehealth services as a process change with potential benefits [27]. Recent comments from Seema Verma, Administrator for the Centers for Medicare & Medicaid Services (CMS), seem to bode well for a continuation of the expanded opportunities for telehealth: “I think the genie’s out of the bottle on this one. I think it’s fair to say that the advent of telehealth has been just completely accelerated, that it’s taken this crisis to push us to a new frontier, but there’s absolutely no going back.” [34]. As health information technology policies evolve, it will be advantageous to ensure all patients at nutrition risk, including those who do not have COVID-19, have access to nutrition care services via telehealth.

Conclusion

There is still much to be learned about malnutrition and COVID-19. The experiences and recommendations described above all lead to the need for continued research into the patient-specific, clinical, economic, and policy implications to determine the appropriate guidance on a broader scale. As recently suggested in a national blueprint for quality malnutrition care, integrating malnutrition care into pandemic and emergency preparedness planning is critical [2]. Advocacy for appropriate and timely nutrition support can help improve clinical outcomes and reduce or prevent the impact of malnutrition on patients with COVID-19 [15]. An interdisciplinary and patient-centered approach is essential to provide successful, holistic care for patients, even in the midst of a pandemic. Taking stock of reported clinical experiences and lessons learned will help to more effectively plan for the future, because as experts have declared, “COVID-19 is here to stay, and... it is better to be prepared.”[10].

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Conflicts of Interest

MBA and CB are employees of the Abbott Nutrition Division of Abbott and shareholders of Abbott. WE is a consultant for Avalere Health and SMM is an employee of the Academy of Nutrition and Dietetics.

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