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Deepa Handu, PhD, RD, LDN, Lisa Moloney, MS, RDN, Mary Rozga, PhD, RD, Feon Cheng, PhD, MPH, RDN, CHTS-CP

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Evidence Analysis Center

Deepa Handu, PhD, RD, LDN[a*], Lisa Moloney, MS, RDN[b]; Mary Rozga, PhD, RD[c]; Feon Cheng, PhD, MPH, RDN, CHTS-CP[d]

[a*]Corresponding author.

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[a]Senior Scientific Director, Academy of Nutrition and Dietetics Evidence Analysis Center. 120 S. Riverside Plaza, Suite 2190; Chicago, Illinois 60606-6995; Phone: 312-899-4704; email: dhandu@eatright.org

[b] Nutrition Researcher, Academy of Nutrition and Dietetics Evidence Analysis Center. 120 S. Riverside Plaza, Suite 2190; Chicago, Illinois 60606-6995; ; Phone: 312-899-4785; email: lmoloney@eatright.org

[c] Nutrition Researcher, Academy of Nutrition and Dietetics Evidence Analysis Center. 120 S. Riverside Plaza, Suite 2190; Chicago, Illinois 60606-6995; ; Phone: 312-899- 1758; email: mrozga@eatright.org

[d] Nutrition Researcher, Academy of Nutrition and Dietetics Evidence Analysis Center. 120 S. Riverside Plaza, Suite 2190; Chicago, Illinois 60606-6995; ; Phone: 312-899- 1757; email: fcheng@eatright.org

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Abstract

Recent evidence examining adults infected with COVID-19 has indicated a significant impact of malnutrition on health outcomes. Individuals who have multiple comorbidities, are older adults, or who are malnourished are at increased risk of being admitted to the intensive care unit and of mortality from COVID-19 infections. Hence, nutrition care to identify and address malnutrition is critical in treating and preventing further adverse health outcomes from COVID-19 infection. This document provides guidance and practice considerations for Registered Dietitian Nutritionists (RDNs) providing nutrition care for adults with suspected or confirmed COVID-19 infection in the hospital, outpatient, or homecare settings. In addition, this document discusses and provides considerations for RDNs working with individuals at risk of malnutrition secondary to food insecurity during the COVID-19 pandemic.

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Introduction

Medical Nutrition Therapy (MNT) plays an important role in the prevention and treatment of malnutrition. There is significant evidence to demonstrate that protein-energy malnutrition from inadequate dietary intake can increase risk of infectious diseases.[1] Reciprocally, any exposure, including infectious disease, that impairs immune function and causes malabsorption, increased catabolism, or decreased nutrient intake can increase risk of malnutrition. Exploratory studies indicate that patients infected with Coronavirus disease of 2019 (COVID-19) experience some or any of the following symptoms: fever, cough, shortness of breath, muscle ache, confusion, headache, sore throat, chest pain, pneumonia, diarrhea, nausea and vomiting, and loss of taste

and smell, all of which may influence nutrition status, and, ultimately immune function.[2,3] The term *malnutrition* is most simply defined as imbalanced intake of protein and/or energy over prolonged periods of time and can occur in bot underweight and overweight.[4] The current document provides guidance that primarily focused on protein-energy malnutrition, which can result from inadequate intake, increased requirements, impaired absorption, and/or altered nutrient utilization.[5]

The purpose of this document is to provide general guidance and practice considerations for Registered Dietitian Nutritionists (RDNs) providing care to the malnourished adult in the hospital, outpatient or home care settings during the COVID-19 pandemic, including:

- Screening and assessment for malnutrition in adults with suspected or confirmed COVID-19 infection;
- MNT for critical illness in the hospital for adults with suspected or confirmed COVID-19 infection;
- MNT for adults with suspected or confirmed COVID-19 infection managing mild to moderate symptoms at home, including transitioning to home from the hospital; and
- Adults experiencing increased food insecurity secondary to the COVID-19 pandemic.

While there are currently no nutrition guidelines specifically for adults with or at risk for COVID-19 infection, many existing guidelines on the Evidence Analysis Library and from other organizations are still applicable and can be used to provide guidance when working with adults with COVID-19 infection.[6] However, some adjustments may be required to meet the increased metabolic and functional needs caused by the COVID-19 infection and treatments. The following discussion and guidance are based on best current knowledge and existing guidelines

from the Academy of Nutrition and Dietetics (Academy) and other organizations. This document is not exhaustive and there is still much to be learned about the effect of nutrition management on COVID-19 infection and severity.

I. Screening and assessment of malnutrition in adults with suspected or confirmed COVID-19 infection

It has been well-established that malnutrition is associated with poor health outcomes.[7] In the context of an infection, such as COVID-19, an individual with malnutrition may have sub-optimal immunity, contributing to a longer or more difficult recovery. Nutrition screening aims to identify patients who are at risk for malnutrition and provide a referral for RDN to deliver detailed nutrition care based on the nutrition care process,[8] including assessment, diagnosis and intervention by an RDN, in order to treat and prevent further malnutrition and consequent adverse health outcomes.

For adults with suspected or confirmed COVID-19 infection, the Malnutrition Screening Tool (MST) can be used to identify individuals who are at risk of malnutrition regardless of setting.

A recent systematic review and corresponding position paper published by the Academy states, "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."[9]

The MST appears to still be applicable for adults with COVID-19, as it is a quick and easy-to-use validated tool based on two questions addressing decreased intake due to poor appetite and recent unintentional weight loss.[10] Due to limited resources and staff during the COVID-19 pandemic, some nutrition screening procedures may require flexibility to better meet safety needs and operational needs of an organization. For example, while nurses or other team members may have conducted nutrition screening prior to the COVID-19 pandemic, during the pandemic, these professionals may be needed for emergency patient care and may not be able to perform malnutrition screening. In these cases, the nutrition team could carry out the screening process so that patients who are at risk for malnutrition can receive appropriate nutrition assessment and intervention without delay. Also, special coordination, such as conducting nutrition screening using patient room telephones, can be considered to minimize staff exposure.

For adults with suspected or confirmed COVID-19 infection, the RDN should perform a comprehensive nutrition assessment to identify malnutrition regardless of setting.

Although there are currently no nutrition guidelines specifically for patients with COVID-19, the Academy's assessment recommendations within evidence-based practice guidelines, available on the Evidence Analysis Library, can be used to guide nutrition assessment for individuals with suspected or confirmed COVID-19.[6] **Appendix 1** displays some examples of nutrition assessment guidance for critically ill individuals in the five domains: food and nutrition-related history, anthropometric measurements, biochemical data, medical tests and procedures, nutrition-focused physical findings, and client history. Most of these nutrition assessment tools and

procedures are applicable to adults with suspected or confirmed COVID-19 infection. For instance, the Subjective Global Assessment can still be used to diagnose nutrition status, and it is important to take medications and IV drips, such as Propofol or Dextrose 5% (D5), into consideration when assessing patients, so nutrition prescription can be adjusted as needed. In the context of the COVID-19 pandemic, touching or gentle palpating the patient to determine muscle and fat store losses may not be possible. In these cases, the RDN can still conduct visual inspection to note indentions and bony prominences which could indicate somatic losses. For RDNs working directly with patients infected with COVID-19, personal protective equipment (PPE) should be used per institution policy while conducting in-person nutrition assessment. RDNs may also utilize nursing and physician notes to provide evidence of wasting as the disease progresses.

A comprehensive assessment should result in the RDN determining the nutrition diagnosis. Examples of potential nutrition diagnoses applicable to adults infected with COVID-19 may include malnutrition, increased nutrient needs, predicted inadequate energy intake, altered gastrointestinal function, or inadequate energy intake. Additionally, nutrition assessment can assist in identifying the key etiology of the diagnosis, which will help the RDN determine the best intervention for each patient. For example, an RDN might identify a patient's inability to reach protein and energy needs orally resulting in the need for supplemental oral or enteral nutrition (EN).

II: MNT for adults with malnutrition in the intensive care unit (ICU) with suspected or confirmed COVID-19 infection

Most patients admitted to the ICU with COVID-19 are acutely malnourished.[11] Poor appetite is common with infection, and patients with non-invasive ventilation (NIV) (no endotracheal tube or tracheostomy tube, such as CPAP or BiPAP, often have inadequate intake of calories and protein to meet needs.[12] Critically ill ICU patients should be provided with small frequent feedings including high energy and protein foods and oral nutrition supplements. If protein and energy needs cannot be met with oral intake, nutrition support should be initiated. Though EN is typically the preferred route for nutrition support, airway complications may occur in patients with NIV, and parenteral nutrition may be therefore considered under these conditions.[13]

In individuals with suspected or confirmed COVID-19 infection in the ICU who are not mechanically vented, RDNs should work with the multi-disciplinary team to ensure adequate protein and energy intake. When needs cannot be met orally, enteral nutrition is preferred to parenteral nutrition. If enteral nutrition is not appropriate or tolerated, parenteral nutrition must be initiated in a timely manner to treat and prevent further malnutrition.

EN Initiation

In adults with suspected or confirmed COVID-19 infection in the ICU, RDNs should work with the multi-disciplinary team to ensure nutrition support is initiated within 36 hours of hospitalization or within 12 hours of intubation.

Nutrition support should be initiated as soon as possible, ideally within 36 hours of hospitalization or within 12 hours of intubation.[14] In adults in the ICU, requiring nutrition support, EN should be provided instead of parenteral nutrition (PN) if the patient is hemodynamically stable and has a functional gastrointestinal (GI) track.[13-15] The RDN should consider holding EN if:

- Mean Arterial Pressure < 65 mm Hg;[14]
- Escalating number and doses of vasopressors;[14]
- Rising lactate levels;[14]
- Unexplained abdominal pain, nausea, vomiting, diarrhea, abdominal distention;[14] or
- Uncontrolled shock, life-threatening hypoxemia, hypercapnia or acidosis.[13]

When EN is not feasible or appropriate, PN may be necessary to treat or prevent malnutrition. PN will require management by a multi-disciplinary care team due to high risk for line sepsis and metabolic complications, such as refeeding syndrome and hyperglycemia.

EN Administration

EN should initially be provided via a nasogastric (NG) tube or orogastric (OG) tube, since placement of feeding tubes in the small bowel could delay initiation of feeding and could increase risk of spreading infection due to the need for skilled staff and confirmation of feeding tube placement.[13,14] The height of the bed should ideally be elevated 30 to 45 degrees,[15] and the nasogastric tube size should be a 10-12 french, preferably 12 french to facilitate bolus feeding if

153 necessary.[14,16] Enteral feeding for patients in prone position is not contraindicated. However, if
154 possible, the height of the bed should be elevated 10-25 degrees.[14]

155 If feeding pumps are available, continuous feeding via a feeding pump is recommended.[14,17] If
156 feeding pumps are not available, the next alternative is a gravity feed. If a gravity feed is not
157 possible, bolus feedings should be provided.[14] Bolus feeds should not be provided to patients
158 with gastric abnormalities nor should they be provided to patients requiring post pyloric
159 feedings.[16] The RDN should develop the bolus feeding and flushing schedule in accordance
160 with fluid restrictions, institutional policies, and how frequently the nurse enters the patient's
161 room to minimize staff exposure to infection.

162

163 **EN Rate and Progression**

164 **In adults with suspected or confirmed COVID-19 infection, RDNs should work with the**
165 **multi-disciplinary team to develop an individualized nutrition prescription based on**
166 **thorough assessment of protein and energy needs to prevent further decline in nutritional**
167 **status.**

168

169 Indirect calorimetry is typically recommended as best practice for estimating energy expenditure.
170 However, indirect calorimetry is not recommended during the COVID-19 pandemic because it
171 requires disconnection from the ventilator circuit and a considerable amount of time, both of
172 which increase risk for COVID-19 transmission to healthcare providers.[13]

RDNs should initiate hypocaloric EN feedings and progress to 15-20 kcal/kg actual body weight (ABW) (use ideal body weight (IBW) if BMI >30 kg/m^2), or less than 70% of Penn State Equation Estimate[15] within the first week.[13,14] During the second week, EN should be advanced to 25 kcal/kg ABW; 11-14 kcal/kg ABW if BMI 30-50 kg/m^2; and 22-25 kcal/kg IBW if BMI>50 kg/m.[13,17] Practitioners must account for energy intake from drips and medications, such as Propofol, when determining energy needs from EN. EN should provide 1.2-2.0 gm of protein per kg ABW in patients with normal weight status, and 1.2-2.0 gm/kg IBW if BMI >30 kg/m.[14,17]

EN Formula and Supplementation

In adults with suspected or confirmed COVID-19 infection, RDNs should take overall nutrition assessment including nutrient needs, fluid status, and interventions to address fluid status into consideration when selecting the type of EN formula.

In adults who are critically ill in the ICU, fluid management is impacted by a multitude of factors, including COVID-19 infection pathology. For the initial resuscitation of patients with COVID-19, physicians are frequently restricting fluid volumes.[18] To further complicate assessment of fluid status, approximately 40% of patients who are critically ill with COVID-19 infection are developing acute kidney injury (AKI).[19] The exact cause of AKI in these patients is unknown, however, dehydration starting prior to admission could be a contributing factor.

Patients who are critically ill with COVID-19 infection could potentially be receiving a significant amount of energy from drips and medications and, due to high protein needs, RDNs should select high protein formulas (≥20% protein) during the acute phase of the illness. RDNs should evaluate blood urea nitrogen (BUN) and creatinine trends as part of their nutrition assessment and adjust the EN rate and formula as appropriate, though recommended protein intake should not go below 1.2 gm/kg to prevent further catabolism. Immune modulating formulas are another option because, theoretically, they may alter a patient's immune response and clinical outcomes. Unfortunately, consistent high-quality evidence for immune modulating formulas are lacking and, therefore, cannot be formally recommended at this time for patients with COVID-19 infections. [14,15]

Some patients may need additional protein and fiber beyond what is provided in the formula. Once patients are no longer in the acute phase of COVID-19 illness, supplemental protein and fiber should be considered. To reduce staff exposure, supplemental protein and fiber should be provided together along with appropriate flushes.[14] Some patients recovering from COVID-19 infection begin to experience diarrhea, at which point a high-fiber formula should be considered.

EN Considerations for (NIV)

In patients with NIV, feeding tube placement may be contraindicated due to potential issues such as air leakage, distention of the stomach, or if the patient is in the prone position.[12] Stomach distention can lead to poor feeding tolerance and impaired diaphragmatic function. If NG/OG placement is appropriate, feeding pumps should be prioritized to patients on NIV so they can be

fed continuously. If a feeding pump is not available, a gravity drip should be considered. Bolus feeds should not be used in patients with NIV due to increased risk for aspiration.[12]

Monitoring and Evaluation

In adults with suspected or confirmed COVID-19 infection, RDNs should monitor nutrition support tolerance daily, and work with the multidisciplinary team to promote tolerance.

Tolerance can be evaluated through a physical examination including abdominal distention, diarrhea, and laboratory values. Gastric residual volumes (GRV) should not be used as a sole indicator of EN tolerance. Practitioners should recommend against holding EN when GRV is less than 500 ml in the absence of other signs of intolerance.[14,15,20] To promote EN tolerance, the RDN should work with the multi-disciplinary team to promote the following initiatives:

- Patients beds should be upright at an angle of 30 - 45 degrees (10-25 degrees if prone).
- If GRVs between 200-500, consider promotility agents.
- If the abdomen remains distended after the above initiatives, consider aspirating the stomach and checking GRV; GRV of < 500ml/6hrs is considered acceptable, repeat after 6 hours if GRV is >500ml.[15]
- In the event a patient is experiencing diarrhea, soluble fiber supplementation should be provided.[14,15]

- If the patient is still not tolerating EN, consider placement of nasojejunal (NJ) tube.[14]
- If EN is not feasible, PN should be initiated as soon as possible.

In addition to physical assessment, laboratory values should be monitored daily. RDNs should monitor for refeeding syndrome and hyperglycemia especially amongst patients receiving PN. To monitor for refeeding syndrome, RDNs should monitor sodium and fluid balance and serum phosphorus, potassium, magnesium and calcium, which may decrease rapidly.[21] If refeeding syndrome is suspected, electrolytes should be immediately replaced intravenously and feeding rate should be decreased.[21]

Post-Intubation

Prolonged ICU stay may exacerbate muscle catabolism, and therefore increase protein needs.[13] Furthermore, dysphagia may result from post-intubation trauma, and its presence for a prolonged period can lead to consequences such as aspiration pneumonia and malnutrition.[22] The nutrition care plan for these patients should incorporate recommendations from the speech-language pathologist and should accommodate increased nutrient requirements of the patients, food preferences, and availability of resources. If severe dysphagia persists and energy and protein needs cannot be met, the RDN may need to either initiate or resume EN. If EN is not possible, PN should be provided until oral or EN can be resumed.[13]

III. MNT for malnutrition in adults with suspected or confirmed COVID-19 infection in outpatient and home care settings, including transitioning to home from the hospital

According to studies from China and case reports in the United States, the majority of all COVID-19 patients exhibited mild to moderate symptoms and hence, managed their illness at home.[3,23] Common symptoms of COVID-19 can lead to problems with nutrient absorption and/or overall inadequate dietary intake. Patients recovering from COVID-19 infection who are discharged from the hospital may still be experiencing COVID-19 symptoms and may be malnourished and, hence, have increased nutrient needs. Therefore, for individuals managing or recovering from COVID-19 symptoms in their homes, maintaining adequate nutrient intake and hydration is critical.

In adults with suspected or confirmed COVID-19 infection who are managing their illness at home, it is crucial for RDNs to provide remote MNT in order to help achieve or maintain optimal nutrition status.

In adults with suspected or confirmed COVID-19 infection who are managing their illness at home, RDNs should work with patients and their families to ensure adequate intake of energy, protein and hydration.

When counseling patients with suspected or confirmed COVID-19 infections who are in their homes or in the outpatient setting, RDNs can advise patients and their families of the following:

- Ensure adequate intake of energy and protein by, at minimum, meeting 100% of the recommended dietary allowance for energy and protein based on age and gender. These requirements will likely be increased due to the pathology of COVID-19 infection.
- High-calorie, high-protein meals and snacks can help prevent weight loss and maintain lean muscle mass. For example, RDNs can advise eating vegetables with cream, butter, margarine, cheese sauce, olive oil, or salad dressing to increase energy intake and choose foods high in protein, such as milk, eggs, cheese, meats, fish, poultry, nuts, and beans.[24]
- Nutrient-dense foods and beverages including oral nutritional supplements are good methods to increase calorie and protein intake if oral dietary intake is not adequate to meet needs (e.g., protein powders and meal replacement shakes and bars).[24]
- For individuals having difficulty coordinating chewing and breathing, beverages might be a better option to efficiently increase energy intake compared to solid foods.
- Micronutrient supplements can help compensate for inadequate oral intake to address deficiencies.[24]
- Manage nausea, vomiting and shortness of breath by offering small, frequent meals and snacks.[25,26]
- Focus on providing foods that require little handling, preparation, or effort to eat.
- Ensure adequate intake of fluids to stay hydrated throughout the day and evening. If the patient is suffering from vomiting and diarrhea, advise consumption of rehydration drinks.

Additional guidance on managing malnutrition through adequate intake of calories, protein, and hydration can be found in the Academy's Nutrition Care Manual, Evidence Analysis Library, and Malnutrition Quality Improvement Toolkit.[6,25,27] Besides nutrition management, RDNs

should consider discussing guidelines for managing safe home care practices including food safety with patients and their families.[28,29]

IV. Additional Nutrition Considerations for Malnutrition in adults during the COVID-19 Pandemic

Adults with Co-morbidities:

While there is no clear evidence demonstrating a causal relationship between COVID-19 infection and underlying comorbidities, recent evidence suggests that the majority of severe symptoms and complications from COVID-19 infection are reported among older adults and individuals with underlying comorbidities such as diabetes, chronic kidney disease, cardiovascular disease, or pulmonary disorders.[23] Individuals with these co-morbidities are already at increased risk of malnutrition, which may contribute to an impaired immune system and exacerbation of symptoms. It is imperative that individuals with pre-existing conditions such as chronic kidney disease, cardiovascular disease, hypertension, or pulmonary disorders receive regular nutrition assessment, and individuals at moderate or high risk of malnutrition receive effective nutrition interventions by RDNs. RDNs should ensure that individuals with co-morbidities have adequate oral dietary intake to meet calorie and protein needs, and oral nutritional supplements may be considered to meet needs if dietary intake is inadequate. The COVID-19 pandemic requires that prevention and management of malnutrition become a focus in patient care.

The Academy has recent guidelines containing recommendations on malnutrition management in chronic kidney disease, cystic fibrosis, and chronic obstructive pulmonary disease (COPD).[6,30,31]

These guidelines are still relevant to patients with COVID-19 and these conditions; however, implementation of these recommendations should include consideration of COVID-19 pathology, PPE standards set by Centers of Diseases Control,[29] and institutional guidelines.

For adults with existing comorbidities and not infected with COVID-19, RDNs should continue to advise consuming a nutrient-dense eating pattern to meet protein and energy needs, with oral supplementation when necessary, to prevent and treat malnutrition.

For adults with existing comorbidities and with suspected or confirmed COVID-19 infection, RDNs should proactively prevent and treat protein-energy wasting by regularly assessing weight and nutritional status when possible, and advising adequate protein and energy intake through diet, with supplementation through oral, EN or PN when necessary.

Micronutrients:

Among patients at risk or with suspected or confirmed COVID-19 infection, there is a paucity of evidence indicating effects of adding micronutrients through supplementation or intravenously on risk or severity of COVID infection. Therefore, it is critical for RDNs to rely on their scientific training and clinical expertise to determine if the patient is deficient in a specific micronutrient and if treating the respective deficiency is a priority. Existing evidence from critical illness population can also help inform practice for patients with COVID-19 infections.

V. Malnutrition and Food insecurity during the COVID-19 Pandemic

While COVID-19 infection itself may increase risk for malnutrition, food insecurity caused by the economic crisis and social isolation secondary to the COVID-19 pandemic may also increase risk for malnutrition.[32] In 2018, 37 million individuals in the US were food insecure.[32] Adults with food insecurity are at higher risk of chronic conditions, such as mental health problems and depression, diabetes, hypertension and sleep problems. Children with food insecurity are at increased risk for poor health, asthma, obesity, anemia, developmental problems, behavioral problems and aggression and anxiety.[33,34]

Currently, there have been no major food shortages reported in the US related to the COVID-19 pandemic.[35] However, unemployment rates have soared,[36] causing unprecedented demand for unemployment benefits and several initiatives to reduce the burden of monthly payments for rent, utilities, or home or student loans. Despite these measures, many individuals are struggling economically, which may decrease accessibility of fresh and healthy foods. Social isolation measures implemented to prevent the spread of COVID-19 infection may also increase risk for food insecurity. For example, in the United States, 29.7 million children[37] depend on free lunches from the National School Breakfast and Lunch Programs, but during the current COVID-19 pandemic, many schools have closed, and clients may be uncertain how to access free meals being provided by schools. Uncertainty of how to access food assistance programs may increase the daily financial burden on low-income families to provide healthy meals. In addition, individuals who are at high risk of severe symptoms and mortality from COVID-19 infection, including individuals who are elderly, may be wary of shopping at the grocery store or may want to avoid public transportation to the grocery store. RDNs working in the community, outpatient,

and hospital settings have a crucial responsibility to identify clients' food access needs and provide federal, state, and local resources to help address these needs.

When appropriate, RDNs should screen for food insecurity, provide guidance and resources for eating healthfully on a budget, and provide resources to improve access to healthy foods.

When working with individuals with or at risk of malnutrition due to food insecurity during the COVID-19 pandemic, RDNs should consider the following:

- It may be advantageous to screen for food insecurity. Validated tools include the 2-item Hunger Vital Sign tool as well as the United States Department of Agriculture (USDA) screening tool.[38-40]

- RDNs can counsel individuals and their families to focus on healthful food choices by providing thrifty meal options with grocery lists and recipes. RDNs can additionally encourage families to reduce their grocery bills by brainstorming methods to decrease food waste.[41-44]

- If possible, RDNs may be able to consult with clients directly in their homes via telehealth. Remote sessions can be an opportunity to reach clients when they are near their cupboards and refrigerators, which may be an effective method of collaborating on dietary changes in real time and place. The Academy provides resources to provide

nutrition resources via telehealth during the COVID-19 pandemic.[45-48] RDNs should ask clients which communication methods they prefer.

- RDNs can facilitate connecting individuals with grocery delivery services as well as neighbors, family, and friends to help those infected with COVID-19 get the food they need to prevent and treat malnutrition.

For clients and families at risk for food insecurity, RDNs should discuss options to improve food access in through federal, state, and local programs.

Due to the unprecedented economic crisis caused by the COVID-19 pandemic, several federal, state, and local food assistance programs have developed, enhanced or modified services in order to meet needs. RDNs should assist in connecting clients with available resources.

- When appropriate, refer clients to a local food bank[49] or assist them in navigating enrollment in federal food assistance programs or Meals on Wheels.[50]
- The United States Department of Agriculture (USDA) has provided several "flexibilities and contingencies" for food assistance programs, including the Supplemental Nutrition Assistance Program (SNAP), the Special Supplemental Nutrition Program for Women Infants and Children (WIC) and the National School Lunch and Breakfast Programs, in order to adapt to increased need for these services along with the reduced capabilities of delivering these services directly to clients .[51]

- The USDA's Food and Nutrition Service responded to the COVID-19 pandemic through efforts to provide school lunches to eligible children when schools are closed through the Summer Food Service Program or Seamless Summer Option,[52] and RDNs can utilize these tools to assist connecting families with the school lunch program.[53]
- The USDA has also provided waivers for WIC requirements to accommodate remote services; WIC food substitution waivers; and provision of emergency food allotments to SNAP households.[51]

As leaders in nutrition, RDNs should advocate for increased access to healthy foods by supporting state and federal initiatives for increased and emergency food assistance.

Increased risk of food insecurity during the COVID-19 pandemic requires proactive, broad-scale action to help individuals and families improve or maintain nutrition status, thus preventing even more damage to health from the COVID-19 pandemic. RDNs can affect change on a state and local level through advocacy through the following venues:

- The Academy's "Action Center" provides templates for letters to representatives or senators to communicate support or opposition for bills that impact public health. RDNs can "Take Action" by visiting this resource and sending a letter of support to their respective lawmakers to help Americans keep food on the table during the COVID-19 pandemic and to urge congress to prioritize federal food assistance program funding.[54]

- Monitor the Academy's Action Center to increase awareness and advocacy for food assistance programs as opportunities arise.[54]
- "Take Action" and monitor opportunities to support food assistance at the Food Research & Action Center[55] and the Alliance to End Hunger.[56]
- Monitor and utilize advocacy tools provided by the Food Research & Action Center, including to maximize the role of the WIC program to support health and food security. [57]

The COVID-19 pandemic has created an unprecedented need for RDNs to assess and address food insecurity among clients and their families through innovative and conscientious nutrition counseling, referral to and participation in food assistance programs, and through taking action to advocate for greater access to food assistance on state and federal levels.

VI. Research Needs

In order to inform evidence-based nutrition and dietetics practice for individuals infected with COVID-19, the Academy is seeking to gather data from RDNs who are currently working with patients infected with COVID-19 or whose work has been impacted by the pandemic. In order to inform evidence-based practice, the Academy is seeking to collect patient-level data as well as data at a systems- or process- level using surveillance surveys. The Academy is requesting RDNs register in ANDHII (www.ANDHII.org), which is the Academy's, free, de-identified system for collecting patient-level data, in order to document nutrition care of patients infected with COVID-19. For the patient-level data, the Academy does not specify what, when or how much data RDNs enters into the ANDHII system, but requests practitioners enter data as they have the time and capacity to do so. Collection of this type of patient level data is needed in order

446 elucidate effective interventions to support RDNs in their day-to-day efforts with COVID-19
447 patients and for future pandemics.

448

449 **Conclusion**

450 MNT is an integral aspect of managing malnutrition due to COVID-19 infection. RDNs should
451 proactively implement appropriate nutrition care plans to assess, prevent and treat malnutrition in
452 collaboration with a multi-disciplinary team for individuals with or at risk for COVID-19
453 infection. The guidance provided in this document can assist RDNs in screening, assessing and
454 intervening to prevent and treat malnutrition in patients infected with COVID-19 who are
455 hospitalized or in an outpatient or home care setting and for those at risk for food insecurity
456 secondary to the COVID-19 pandemic. RDNs should work proactively with multi-disciplinary
457 teams and advocate for appropriate and timely nutrition support to effectively improve clinical
458 outcomes and reduce or prevent the adverse consequences of malnutrition in individuals with or
459 at risk for COVID-19 infection.

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463

464 **Appendix 1: Nutrition Assessment of Critically Ill Adults adapted from Academy's Critical**

465 **Illness guidelines[15]**

CI: Assessment for Critically Ill Patients

The Registered Dietitian Nutritionist's (RDNs) assessment of critically ill adults should include, but not be limited to the following:

Food and Nutrition-Related History:

- History of nutrient intake (energy intake, meal-snack pattern, macro- and micronutrients, etc.)
- Adequacy of nutrient intake/nutrient delivery
- Bioactive substances (alcohol intake, soy protein, psyllium, fish oil)
- Previous and current diet history, diet orders, exclusions and experience, cultural and religious preferences
- Changes in appetite or usual intake (as a result of the disease process, treatment, or comorbid conditions)
- Disease-specific nutrient requirements
- Food allergies/intolerances
- Appropriateness of nutrition support therapy for the patient
- Food and nutrient administration (oral, enteral or parenteral access)
- Physical activity habits and restrictions

Anthropometric Measurements:

- Weight, Height
- Weight change
- Body mass index (BMI)
- Body compartment estimates (fat mass, fat-free mass).

Biochemical Data, Medical Tests and Procedures:

- Biochemical indices (glucose, electrolytes, others as warranted by clinical condition)
- Implications of diagnostic tests and therapeutic procedures (indirect calorimetry measurements, radiography for confirmation of feeding tube placement, other gastrointestinal (GI) diagnostic tests)

Nutrition-Focused Physical Findings:

- Nutrition-focused physical examination that includes, but is not limited to: Fluid assessment, functional status, wound status, clinical signs of malnutrition/overnutrition and/or nutrient deficiencies
- Intake and output (I's and O's) including stool and fistula output, wound drainage
- Existing or potential access sites for delivery of nutrition support therapy
- Abdominal exam
- Fluid status (edema, ascites, dehydration)

- Vital signs.

Client History:

- Medical and family history and comorbidities
- Surgical intervention
- Effect of clinical status on ingestion, digestion, metabolism and absorption and utilization of nutrients
- Indicators of acute or chronic nutrition support-related complications
- Medication management
- Factors that may influence existing or potential access sites for delivery of nutrition support therapy.

Assessment of the above factors is needed to correctly diagnose nutrition problems and plan nutrition interventions. Inability to achieve optimal nutrient intake may contribute to poor outcomes.

Rating: Consensus

Imperative

CI: Reassessment of Critically Ill Adults

The Registered Dietitian Nutritionist's (RDNs) reassessment of critically ill adults should include:

- Changes in nutrient needs
- A determination of daily actual intake of enteral nutrition (EN), parenteral nutrition (PN) and other nutrient sources
- EN/PN access site
- Changes in clinical status, weight, biochemical data and intake and output (I's and O's)
- Changes in nutrition-focused physical assessment findings.

Rating: Consensus

Imperative

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