





Ethical Framework for Nutrition Support Resource Allocation During Shortages: Lessons From COVID-19

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Albert Barrocas, MD, FACS, FASPEN¹ ; Denise Baird Schwartz, MS, RD, FADA, FAND, FASPEN² ; Jeanette M. Hasse, PhD, RD, LD, CNSC, FASPEN, FADA³ ; David S. Seres, MD, FASPEN, PNS⁴ ; and Charles M. Mueller, PhD, RDN, CDN, CNSC⁵

Abstract

The coronavirus disease 2019 (COVID-19) pandemic has impacted all aspects of our population. The “Troubling Trichotomy” of what can be done *technologically*, what should be done *ethically*, and what must be done *legally* is a reality during these unusual circumstances. Recent ethical considerations regarding allocation of scarce resources, such as mechanical ventilators, have been proposed. These can apply to other disciplines such as nutrition support, although decisions regarding nutrition support have a diminished potential for devastating outcomes. The principal values and goals leading to an ethical framework for a uniform, fair, and objective approach are reviewed in this article, with a focus on nutrition support. Some historical aspects of shortages in nutrition supplies and products during normal circumstances, as well as others during national crises, are outlined. The development and implementation of protocols using a scoring system seems best addressed by multidisciplinary ethics and triage committees with synergistic but disparate functions. Triage committees should alleviate the burdens of unilateral decisions by the healthcare team caring for patients. The treating team should make every attempt to have patients and the public at large update or execute/develop advance directives. Legal considerations, as the third component of the Troubling Trichotomy, are of some concern when rationing care. The likelihood that criminal or civil charges could be brought against individual healthcare professionals or institutions can be minimized, if fair protocols are uniformly applied and deliberations well documented. (*Nutr Clin Pract.* 2020;35:599–605)

Keywords

coronavirus; COVID-19; enteral nutrition; ethics; nutrition support; parenteral nutrition; resource allocation; SARS-CoV-2

Introduction

The unwelcome arrival of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the cause of the coronavirus disease 2019 (COVID-19) pandemic, has led healthcare professionals to face situations that were given little, if any, attention in the past. Discussions and policy-making regarding the management of scarce or absent resources, such as ventilators, have become commonplace. Taking into consideration that the situations in different regions are evolving in various ways, this article will attempt to summarize the impact of the pandemic on nutrition support practice. The authors provide suggestions for management of nutrition support resources and how multidisciplinary bioethics or triage committees can help direct decisions. Other articles have provided nutrition recommendations for providing care to patients with COVID-19.¹ This article does not review nutrition support prescriptions—when and what to feed—rather it focuses on the ethics issues related to resources. The considerations presented are based on what is currently known. These are highly likely to change as we gain experience with COVID-19. Vigilance is necessary,

as this pandemic is different from any prior influenza outbreaks.

From the ¹Tulane University School of Medicine, New Orleans, Louisiana, USA; ²Bioethics Committee, Providence Saint Joseph Medical Center, Burbank, California, USA; ³Baylor University Medical Center, Baylor Simmons Transplant Institute, Dallas, Texas, USA; ⁴Department of Medicine, Columbia University Medical Center, New York, New York, USA; and the ⁵Didactic Program in Dietetics, Department of Nutrition Food Studies, New York University/Steinhardt, New York, New York, USA.

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Corresponding Author

Albert Barrocas, MD, FACS, FASPEN, Adjunct Professor of Surgery, Tulane University School of Medicine, 4050 Spalding Dr, Atlanta, GA 30350, USA.

Email: abarroc@tulane.edu

Background

The COVID-19 pandemic has presented us with the Troubling Trichotomy²—namely, what can be done *technologically*, what should be done *ethically*, and what must be done *legally*. Technologically, efforts are underway to prevent, manage, and hopefully eradicate COVID-19. These include, for example, mitigation practices with the population and medical components that include personal hygiene, social distancing, personal protective equipment, sheltering in place, possible use of antiviral medications, convalescent plasma, and vaccines. The role that nutrition support interventions play remains undefined.

Traditionally, medical-ethical decision-making in the United States has been guided by the 4 principles of autonomy, beneficence, nonmaleficence, and distributive justice (fairness in the allocation of goods). Whether this last principle refers to the actual possession of or equal access to those goods, or even if possession of the good is a privilege and not a right, it is subject to debate. Autonomy, the paramount principle that should be respected under all circumstances, may be superseded by any of the other 3 in times of limited resources. Ethical principles dictate the allocation of resources when they are scarce in such a way to provide the best care to the greatest number or, conversely, to decrease the number who will be harmed. The interest of the community at large may need to supersede individual interests. This problem was described by Gostin et al³: “How do we ethically and legally balance public health with civil liberties?”

Legally, the criminal and civil liability and penalty for the actions taken during normal circumstances may or may not be applicable during national crises or emergencies, such as the current pandemic. Healthcare professionals can minimize the likelihood of legal repercussions by assuring appropriate communications and documentation and applying systematic policies (eg, the A-B-C-D rule to be discussed later in this article).

Historical Perspective

The concept of rationing is not new to healthcare. Military triaging of wounded soldiers has been practiced for centuries. It divides casualties into those likely or unlikely to survive. This is now in common use in civilian emergency mass-casualty response. When resources are rapidly depleted, they are expended on those most likely to survive. Organ transplantation is a daily example of healthcare rationing because of limited donors. Selection of recipients is usually determined based on several criteria established by institutional transplant selection committees and the Organ Procurement and Transplantation Network of the US Health Resources and Services Administration.³

In the last decade, discussions of healthcare scarcity have often evolved along economic lines, where access is de facto rationed to those who can afford health insurance. The survival of the fittest by ability to pay for healthcare criteria has been touted as an example of “jungle ethics,” based on Darwinian theory of natural selection.⁴ These economic disparities have become more acute during the pandemic and have sharpened focus on the debates on nationalized healthcare.

A variety of shortages of nutrition support products and components have been occurring for years. Short supplies of components of parenteral nutrition (PN) have been addressed with guidance from the American Society for Parenteral and Enteral Nutrition (ASPEN).⁵ Conservation of resources becomes even more important in times of natural disasters or other crises when shortages may be prolonged and exacerbated by altered or increased usage or difficulties in manufacturing or distribution.⁵⁻⁷ Management of nutrition needs during natural disasters⁸ and even specific events, such as Hurricane Sandy,⁶ Japan’s earthquake/tsunami,⁹ and Hurricane Katrina,⁷ have been previously published.

Bioethical considerations regarding end-of-life decisions have been addressed in the past,¹⁰ but these dealt primarily with individual patients and/or surrogate decision-makers and not crisis-based or shortage-based decision-making. Many standard policies and practices assume there is an inexhaustible supply of resources and ready access to procedures and practitioners. These often eschew the intentional consideration of justice as it applies to scarcity in ethical considerations specific to the care of individuals. Scarcity forces us to consider the needs of those most likely to benefit from medical interventions. These decisions, however, may be difficult to codify fairly. For example, criteria such as age may fairly or unfairly stratify the likelihood of benefit.

The Reality of the Moment: Current Crisis

The COVID-19 pandemic has catapulted us into a situation in which frontline healthcare professionals are facing the need to make difficult rationing decisions. The potential for resource-based decisions regarding nutrition support, although not as dramatic and final as ventilator allocation, may be on the horizon. Moreover, healthcare providers themselves may be considered a scarce resource. Given the dangers to the healthcare worker through contact with patients infected with COVID-19, nutrition practitioners should be concerned about nutrition support prescriptions that require repeated contact with the patient (eg, protein modular supplements, bolus vs continuous tube feeding). Increasing the frequency of visits is likely to increase the risk to workers via repeated exposures to infected patients and increased consumption of personal protective equipment. This could potentially lead to the loss of a scarce resource,

specifically the healthcare worker who could become ill or quarantined from exposure, to say nothing of the human cost if the healthcare worker succumbs to COVID-19.

Issues regarding shortages of enteral formulas, supplies, and pumps have been reported in some hospitals around the US (personal communication, anonymous sources). The shortages may be related to increased demand rather than limitation in production and transportation, since nutrition manufacturers are considered essential and continue to operate around the clock. Some of the shortages in areas of the country could be alleviated by the mobilization of products located in another part of the supply chain. For example, hospitals that may have an abundance of products, but currently low occupancy rate, could provide products to institutions in need via a hospital-to-hospital transfer. In addition, some healthcare professionals providing care to critically ill patients with COVID-19 may not be acquainted with the various nutrition products, adding to inappropriate utilization, scarcity, and potential complications.

The Ethical Decision-Making Process

Resource Allocation Guidelines

During the COVID-19 crisis, basic ethical principles and recommendations will apply, regardless of the resource in question. Scarce resources must not be allocated based on such things as ability to pay, race, religion, sex, social status and connections, class or group, wealth, citizenship, or intellectual disability. The following concepts are proposed for healthcare providers and institutions to consider in resource allocation decisions, based on 3 recently published articles.^{11–13}

Four fundamental values have been proposed by Emanuel *et al*¹²:

1. Maximizing benefits produced by scarce resources.
2. Treating people equally.
3. Providing and rewarding instrumental value (a person with instrumental value is one who saves others).
4. Giving priority to the worst off (“worst off” refers not only to the sickest but also to those who have the most to lose in the long term if they die, such as young people).

Emanuel *et al*¹² constructed 6 recommendations from these 4 ethical values:

1. Benefits should be maximized. Save the most lives and maximize improvements in individual posttreatment length of life.
2. Priority for allocation is given to healthcare workers and others in the front lines of care.
3. There should be a random allocation for patients with similar prognoses.

4. Different prioritization per intervention may arise in response to changing scientific evidence.
5. Some priority should be given to individuals who participate in research to prove the safety and effectiveness of vaccines and therapeutics. This criterion should be used as a tie breaker in patients with similar prognoses.
6. There should be no differentiation in allocating resources between patients with COVID-19 and those with other medical conditions.

The principles and recommendations referenced above are not universally accepted, are the subject of ongoing discussion, and are presented here to illustrate some of the issues being debated in clinical ethics. Prioritization of frontline workers (#2), for example, raises issues of privilege. Similarly, if the prognosis of COVID-19 acute respiratory distress syndrome (ARDS) is different from other forms of ARDS, codification of a similar distribution of resources (#6) ignores medical judgment.

Translating and implementing the resource allocation recommendations require input from clinicians, ethicists, religious leaders, administrators, lawyers, public and patient representatives, and other interested parties. They should work in a multidisciplinary or cross-functioning fashion, in which the focus is on the function of the team rather than who carries out the function. There is no one-size-fits-all approach in planning the development and implementation of allocating resources because of the heterogeneity of geographic locations, hospital or institution size, and affiliations. Each institution should develop their protocols to be adaptable to their environment and available personnel. The protocols should be evidence based and as objective as possible to assure just treatment and uniformity to all.

Ideally, allocation decisions should be based on high-quality prognostic assessments. Several scoring systems have been developed to assist in the process. All are limited. One such example, developed by White and colleagues at the University of Pittsburgh, proposed and implemented a priority score (possible scores being 1–8) for patients with critical illness, based on the concept of maximizing benefits for the largest numbers of the population.¹³ This system considers both surviving to hospital discharge and the likelihood of achieving long-term survival. The short-term survival scores range from 1 to 4 and are based on physiological parameters, such as the Sequential Organ Failure Assessment (SOFA) score. Long-term survival scores are assigned 2 points for those with major conditions and 4 points for those with serious, life-limiting conditions with expected survival < 1 year. Low scores indicate more favorable prognoses than high scores (Figure 1). The implementation of such objective strategies requires an initial assessment and frequent reassessment of a patient’s condition. There is significant controversy about substituting clinical judgment

Objective	Measurement modality	Number of points			
		1	2	3	4
Reduce short-term mortality	Prognostic scale predicting short-term survival (e.g., SOFA ^b or APS ^c component APACHE ^c)	Predicted mortality <10% (e.g., SOFA score 0–5 or APS <50)	Predicted mortality 10–20% (e.g., SOFA score 6–8 or APS 50–69)	Predicted mortality 21–40% (e.g., SOFA score 9–11 or APS 70–95)	Predicted mortality >40% (e.g., SOFA score ≥12 or APS >95)
Increase long-term survival	Assessment of coexistent conditions		Comorbidities that will have significant impact on long-term survival		Life-threatening comorbidities with survival > 1 year unlikely

Figure 1. Scoring system for determining priority for scarce resources.^a The short-term survival scores range from 1 to 4 and are based on physiological parameters, such as the Sequential Organ Failure Assessment (SOFA) and Acute Physiology and Chronic Health Evaluation (APACHE) scores. Long-term survival scores are assigned 2 points for those with major conditions and 4 points for those with serious, life-limiting conditions with expected survival < 1 year. Low scores indicate more favorable prognoses than high scores. APS, Acute Physiologic Score.

^aBased on White DB.¹³ A Model Hospital Policy for Allocating Scarce Critical Care Resources. University of Pittsburgh School of Medicine. Published online March 27, 2020. Accessed April 7, 2020. <https://cem.pitt.edu/?q=content/model-hospital-policy-allocating-scarce-critical-care-resources-available-online-now>.

^bSOFA determines the extent of a person's organ function (scoring 1–4 for each of the 6 organ systems [respiratory, coagulation, hepatic, cardiovascular, central nervous system, and renal] with lower scores reflective of better function). Vincent, J-L, et al. Use of the SOFA score to assess the incidence of organ dysfunction/failure in intensive care units: Results of a multicenter, prospective study. *Care Med.* 1998;26(11):1793-1800. Accessed April 10, 2020. https://pdfs.semanticscholar.org/0dc4/199eee6ba652eed625700a486ee4c54e20f8.pdf?_ga=2.158795834.146485369.1586573468-1425886,016.1586573468.

^cThe APS is a component of the APACHE scoring system (Zimmerman JE, Kramer AA, McNair DS, Malila FM. Acute Physiology and Chronic Health Evaluation (APACHE) IV: hospital mortality assessment for today's critically ill patients. *Crit Care Med.* 2006;34(5):1297-1310). APACHE uses multiple physiologic variables, age, and chronic health conditions to produce a predictive score, and APS is derived from the physiologic variables; higher scores indicate poorer prognoses. The absolute APACHE and APS scores depend on the version used: scores range ≤ 286 for APACHE and ≤ 239 for APS. Calculator for both APS and APACHE-IV available at <https://intensivecarenetwork.com/Calculators/Files/Apache4.html> (Accessed April 13, 2020).

with a scoring system. However, disagreement between scoring and clinical judgment may be attenuated through use of multidisciplinary teams for adjudication.

Nutrition Support Allocation

The role of nutrition support professionals in the deliberations of resource allocation cannot be underestimated, although decisions regarding nutrition support do not equate in gravity with the finality of those dealing with forgoing (either withholding or withdrawing) ventilatory support. The nutrition support professionals are pivotal in assessing the patient's overall condition and need for, if any, nutrition interventions. Nutrition support professionals can recommend changes in volume, composition, and routes of nutrition support, as well as help cluster care to limit how

many times a nurse must go in the room of a COVID-19-infected patient to accommodate limited or no resources.

Nutrition support professionals should also be involved in the process of scarce nutrition support resource allocation. For example, if a hospital has fewer numbers of enteral nutrition (EN) pumps or supplies than there are patients requiring pump-assisted feedings, the nutrition support professionals would need to provide guidance on EN-pump allocation. EN pumps may need to be prioritized for the patients with critical illness who cannot safely receive or tolerate gravity or intermittent feedings. Once pumps and supplies are freely available, pump-assisted EN could resume for all patients who would ordinarily receive this mode of feeding.

Nutrition support professionals should be represented in bioethics committees (discussed below) when nutrition

issues arise. Recommendations by the nutrition support professionals or a nutrition support team should be guided by the benefit-vs-risk/burden evaluation. The nutrition support professionals should communicate with peers in other institutions in their communities to reach consensus on protocols, thus adding to strength and uniformity of such approaches.

Bioethics and Triage Committees

Ethical dilemmas related to the care of patients in the COVID-19 pandemic need to be rapidly addressed by multidisciplinary bioethics committees, with the development of policies and procedures to assist providers in making difficult allocation decisions. Contingencies relating policies to the conditions of scarcity must be included. In other words, policies for rationing scarce resources should apply only during times of scarcity. What defines scarcity can also be controversial. For example, if everyone who needs a ventilator is on a machine, but patient-to-nurse ratios are twice normal and machines not intended for critical care ventilation are being used, care is nonstandard as a result of limited resources. It would be reasonable to consider this a condition of scarcity. Although this type of scarcity is highly unlikely to affect nutrition care in the hospital, it is illustrative. Nutrition support resource scarcity could include limited enteral formulas, parenteral solutions, feeding tubes, and related supplies, as well as enteral and parenteral pumps.

Triage committees should be created based on recommendations from bioethics committees, with input from hospital legal consultants and administration, and become activated once scarcity has been declared. The triage committee is not a new concept. Such groups were formed in the 1960s when decisions had to be made regarding who would receive hemodialysis.¹⁴ These committees were composed of physicians, nurses, ethicists, community representatives, and other interested parties. However, because of the volume and speed with which decisions are anticipated during a pandemic, a small, facile team may be desirable. Difficult allocation decisions should fall to these multidisciplinary triage teams, rather than the primary treatment team, to alleviate any concerns about preferential treatment or bias. These teams should contain, at a minimum, a clinical ethicist and clinicians familiar with the treatment of COVID-19 and/or critical illness to make the process as fair and transparent as possible. The criteria used to make decisions should also be transparent.

Because of the nature of decisions related to allocation of scarce resources, the media is likely to pay close attention to the actions of each hospital. Similarly, regulators and lawmakers may be risk averse in allowing healthcare facilities more autonomy in allocation of scarce resources.

For example, based on New York state law, nutrition support cannot be withheld without a patient's permission or that of their surrogate.¹⁵ Temporarily suspending that law could create a profound public response. Healthcare facility bioethics committees are well advised to rapidly form regional consortia to ensure regional homogeneity in policy and to provide stronger representation of the ethical needs of the healthcare enterprise to regulators and lawmakers.

Advance Care Planning

Critical thinking is crucial in preventing ethics dilemmas and to assist in healthcare decision-making with a focus on achieving patient-centered care.¹⁶ Advance care planning (ACP) is recommended for all individuals aged ≥ 18 years; it becomes more essential during crises, such as COVID-19, than during noncrisis times. Healthcare professionals should take the lead and complete their own ACP documents. The healthcare team should encourage the public and their patients to complete ACP documents and advance directives. Advance directives should be updated, as warranted, and considered as a patient's plan of care is formulated with the patient/family. Existing advance directives should be reviewed to ensure specific language addressing the potential of resource allocation is included. Helpful resources for ACP are available online.¹⁷⁻²⁰

Respecting the patient's or surrogate decision-maker's autonomy is still of importance, even in the face of shortages. A thorough approach to obtaining advance directives might alleviate some of the burden on scarce resources. Although removal from life-sustaining treatment (LST) is not considered to be ethically or legally different from withholding LST (thus the term forgoing), removal is undoubtedly more emotionally laden. In the case of nutrition support, clear prognostic discussions and advance directives may preclude the initiation of EN or PN that is not felt to offer quality-of-life or quantity-of-life benefit.

Do-Not-Resuscitate Orders

Discussions regarding do-not-resuscitate orders, particularly when held urgently, are emotionally laden for all involved. Curtis *et al* proposed the concept of "informed assent" instead of informed consent.²¹ Rather than requiring the patient and/or family to take responsibility for the decision, the clinician requests from them permission to allow the clinician (attending physician) to assume that responsibility. A well-documented process for obtaining informed assent was previously published.²¹ In addition, specific steps in conducting critical/crucial conversations have been described previously.¹⁰

Legal Concerns

Legal considerations make up the third component of the Troubling Trichotomy. Although the likelihood of legal (civil or criminal) penalties may be minimal under pandemic or crisis medical care, such concerns and potentials exist.²² Forgoing interventions without a patient's consent or assent, under normal circumstances, can result in a civil claim of negligence or unintentional tort (harm). Following standardized protocols, such as using the A-B-C-D rule, may attenuate the risk. The A-B-C-D rule suggests the following steps: Accepting the patient for whom there has been a **B**reach of duty by violating the applicable standard of care **C**ausing the related **D**amage or harm.^{23,24} The likelihood of holding a clinician or institution liable for forgoing a critical intervention (eg, ventilators, nutrition support), which leads to harm, without a patient's consent is minimized when such actions are the result of uniformly applied triage protocols. State and federal immunities exist in some instances for physicians, nurses, and other practitioners during emergencies but may fall short on specifics. The Viewpoint of Cohen et al²² points out the urgent need for action by state governments to expand and clarify current immunity statutes to include the use of protocols during emergency and pandemic situations.

Conclusion

The impact of the COVID-19 pandemic will be long lasting. Dealing with scarce resources is already a reality and may yet become far worse in areas hardest hit. Resource scarcity may become more widespread and likely more severe if preventive measures, such as physical distancing, are eased prematurely and testing fails to halt the spread.

Based on previously established and accepted ethical principles and values, several systems for quantitative triage have been proposed. Using the objective criteria, nutrition support clinicians should make appropriate recommendations regarding nutrition interventions, based on anticipated benefit, availability of products, cost, and risk to providers. Patients and families should be encouraged to update or execute/create advance directives, based on appropriate prognostic evaluations. Although there may be legal concerns about actions taken during the pandemic, the likelihood of actual liability charges is minimized through appropriate policy-making and uniform application of policy that is regionally homogenous and accepted of law makers. Because of the uncertainty of the course of the COVID-19 pandemic, for which there is currently no cure or vaccine, ethical protocols should be viewed as living documents or a work in progress.

Statement of Authorship

All authors contributed to the conception and design of the article. A. Barrocas drafted and critically revised the manuscript.

D. B. Schwartz, J. M. Hasse, D. S. Seres, and C. Mueller critically revised the manuscript. All authors gave final approval for all aspects of work, agree to be fully accountable for ensuring the integrity and accuracy of the work, and read and approved the final manuscript.

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