

Bioethical perspective for decision making in situations of scarcity of resources during the COVID-19 pandemic

MARIA DEL PILAR DE ANTUENO¹, GABRIELA PEIRANO², ISABEL PINCEMIN³, MARIA ISABEL IÑIGO PETRALANDA⁴, EDUARDO BRUERA⁵

¹ Department of Bioethics, Faculty of Biomedical Sciences, Austral University, Buenos Aires, Argentina.

² Enrique Tornú Hospital, Buenos Aires, Argentina.

³ Hospice San Camilo, Buenos Aires, Argentina.

⁴ Institute of Bioethics, Pontifical Catholic University of Argentina, Buenos Aires, Argentina.

⁵ Department of Palliative, Rehabilitation & Integrative Medicine, Anderson Cancer Center, Houston, Texas, USA.

Corrispondenza: Maria Del Pilar De Antueno, Department of Bioethics, Faculty of Biomedical Sciences, Austral University, Buenos Aires, Argentina; e-mail: pdeantueno@austral.edu.ar.

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ABSTRACT

Lack of resources available in intensive care units (ICU) during the COVID-19 pandemic requires bioethical guidance to respond to dilemmas presented in health teams. A person-centered ethical analysis (PCEA) for ICU clinicians, becomes the best alternative to morally justify extreme decision-making in the scarcity of available resources. The goal is to make a selection based on bioethical and clinical criteria, considering a holistic view of the person, and not just a utilitarian or first-come, first-served criterion as the one set out by colleagues from Oxford University, known as RAPR (Resource Adjusted Probability Ratio) ethical algorithm for rationing life-sustaining treatment during the COVID-19 pandemic. For this reason, fundamental bioethical principles emphasizing therapeutic proportionality and how to make an appropriate moral judgment that conveys to a sensible decision-making ethically grounded are explained, considering a flow chart proposed by colleagues from the Pontifical Catholic University of Chile. In this paper we propose the PCEA Algorithm to assist ICU teams in decision making regarding fair resource allocation and care delivery during an overwhelming pandemic scenario.

RIASSUNTO

Aspetti bioetici per il processo decisionale in situazioni di scarsità di risorse durante la pandemia di COVID-19.

La mancanza di risorse disponibili nelle unità di terapia intensiva (ICU) durante la pandemia di COVID-19 richiede una guida bioetica per rispondere ai dilemmi posti ai team sanitari. Un'analisi etica centrata sulla persona (PCEA) per i clinici della terapia intensiva, diventa la migliore alternativa per giustificare moralmente un processo decisionale estremo, nella situazione di scarsità di risorse disponibili. L'obiettivo è fare una selezione basata su criteri bioetici e clinici, considerando una visione olistica della persona, e non solo un criterio utilitaristico o del first come first served, come quello esposto dai colleghi dell'Università di Oxford, noto come Algoritmo etico RAPR (Resource Adjusted Probability Ratio), per il razionamento del trattamento di sostegno vitale durante la pandemia di COVID-19. Per questo motivo vengono illustrati alcuni principi bioetici fondamentali che enfatizzano la proporzionalità terapeutica e come formulare un giudizio morale appropriato che si rifaccia a un processo decisionale eticamente fondato, considerando un diagramma di flusso proposto dai colleghi della Pontificia Università Cattolica del Cile. In questo documento proponiamo l'algoritmo PCEA per assistere i team di terapia intensiva nel processo decisionale in merito all'equa allocazione delle risorse e alla offerta di cure durante uno scenario pandemico incontrollabile.

Keywords: algorithm, proportionality, decision making, resource scarcity, COVID-19.

Parole-chiave: algoritmo, proporzionalità, decisione clinica, scarsità di risorse, COVID-19.

1. Introduction

Since 2019, SARS COV-2 pandemic has produced many critical situations in public health all over the world. In different countries, health systems have been overwhelmed by the different waves produced by this virus.

The high demands of the pandemic and the lack of material and human resources when delivering care to all patients, has put health care workers in crisis, leading to such high complexity decisions such as selective bed allocation in intensive care units (ICU). This situation is compounded by the physical and emotional exhaustion of those who must make decisions, and, in this context, it creates greater difficulty in the deliberative process, often undertaken in solitude.

The seriousness of the situation is that this decision-making involves denying specific care to some patients affected by the same disease, which generates *burn-out*.

In this context, each country and workforce team used different strategies to resolve dilemmatic situations [1].

This review aims to guide a good decision-making process with the experience gained taking into account the bioethical criteria and the reality that has come to pass since the pandemic began.

2. Objective

The objective of this article is to provide bioethical and clinical criteria based on a comprehensive vision of the patient that allow proper decision-making whenever selecting which patients can access an in-

tensive care unit in the resource shortage situation, during the COVID-19 pandemic.

3. Methods

The EAPC decision-making algorithm was developed to allow doctors working at intensive care units (ICU), intermediate medical unit (IMU) or General Ward (GW) respond to demands during the pandemic, in different Argentine cities, particularly in Buenos Aires. The shortage of health resources for adequate care for all patients during the COVID-19 pandemic, place clinicians in the unavoidable scenario of finding a way to perform a fair patient selection for intensive care beds allocation.

The various national and international documents and guides developed in different countries were consulted, especially those from Spain, Italy and the United States. Bioethical specialists from these countries were also consulted. A bibliographic search was conducted on decision-making processes according to different bioethical currents. Three q-versions were developed and evaluated by four palliative care doctors, two anesthetists, two surgeons, one pediatrician, one hematologist, two intensive care physicians and six bioethicists from the *Universidad Católica Argentina* and *Universidad Austral*.

Personalistic bioethical principles were considered along with the principle of therapeutic proportionality. These principles offer a comprehensive patient vision that surpasses the purely utilitarian or first-come, first-served vision. In this way, patient selection is carried out taking into account various aspects, both clinical (base disease,

age, comorbidities, forecast assessment scores such as SOFA, APACHE II and NECPAL), socioeconomic (family role, presence of young children in charge) and bioethical (beneficence, autonomy, shared decision-making, advance directives, defense of physical life, freedom and responsibility, therapeutic proportionality).

The algorithm was presented as a policy guidance for decision-making in intensive care units in these hospitals from Argentina: *Hospital Universitario Austral*, *Hospital Solidario Covid Austral*, *Hospital de Agudos Pedro Ecay in Carmen de Patagones* (Buenos Aires); *Hospital Regional Artemides Zatti* (Viedma, Río Negro) and *Hospital Luis Carlos Lagomaggiore* (Mendoza).

4. The role of Bioethics as a guide in decision-making

Bioethics provides us with the necessary foundations that serve as the center of the deliberative process. The person's integral condition, comorbidities, desires, and resources of each place should always be taken into account.

The adequacy of therapeutic efforts must at all times provide the best possible care to each patient and his/her family even in a crisis situation because of lack of resources [2].

4.1 The principles of sociability and subsidiarity

The principle of sociability of Personalistic Bioethics refers to distributive justice.

Life and health are the primary assets of the person, and their care depends heavily on the help of others or assistance. In fact, the possibility of regaining health is often dependent on the cooperation of different professionals, the resources offered by different health teams and various institutions. In some ways, this principle refers to helping those most in need of medical care [3].

It is necessary to remember that *the virtue of justice* is to give each one his due, that is, it does not refer to giving everyone equally but to *give each person what is right for them according to their situation*. Justice is the virtue that seeks the realization of the common good in society. In this sense, it is necessary to maximize the overall profit in actions to help the greatest number of patients receive medical care for their sickness [4].

In terms of social justice, the principle of subsidiarity means that when resources are lacking at a certain level, the higher level must supplement it so that everyone can access those resources. Hastings Center's guidelines on the ethical response of medical institutions during the COVID-19 pandemic [5] mention that healthcare leaders have a duty to plan for the management of predictable ethical challenges during a public health emergency. These arise when moral duties or values conflict and there is uncertainty about how to do the right thing in clinical practice. In fact, these ethical challenges can affect the health care provided by a health institution and its collaboration with public officials.

Within the health system there are three levels of care in relation to resources and the quality of care provided [5]:

- *conventional situation*: implies normal use of the resources that are available and the quality of care is in accordance with the usual standards;

- *health contingency situation*: it occurs in the health emergency, reducing the number of beds available, external health personnel are required, hospital areas are rearranged to facilitate patient care;

- *health crisis situation*: is the most extreme situation in which triage protocols are activated, there is a shortage of resources for patient care and there are not enough staff available for health care.

Depending on the level in question, a particular care may be provided to each patient, trying to take a balance between the resources available and the best possible quality of care.

4.2 The principle of freedom and responsibility

This personalistic principle refers to a person's autonomy for decision-making, which must arise from dialogue between the health team and patients. As Páez says: «the principle of autonomy leaves the last word in the hand of the patient, out of respect for his freedom. But if the relationship with the medical team is adequate, the decision will be reasonable for the decision to arise from an exchange of opinions and assessments that will serve to make the most correct determination» [6].

A fundamental consideration for proper reflection on any patient with COVID-19 is to provide, wherever possible from diagnosis or from internment, the review or implementation of joint advance directives.

This process involves careful and personalized communication for each patient, taking into account his or her emotional state and his or her desire to talk about it. In fact, it is the patient who writes the advance directives if he or she so desires. Otherwise, they may be drafted by a surrogate, or ultimately the decision is made by the medical team. It is advisable to identify the referring person for the patient as early as possible. On certain occasions, the affective reference is not the same person as the reference identified for health decision-making.

In order for the patient to make a good decision, the health team must offer the patient the medical treatments that are proportional to his/her situation, but those that are futile should not be offered as they are not medically indicated options. It is also necessary to include whether or not the patient wishes to move to an ICU or receive MRA, if required.

It is essential to ground decision-making on medical history (Health records) from the beginning so that each patient's own process involves continuous review by different doctors who need to treat him (Emergency, General Ward and, where appropriate, ICU), taking into account that it is a revocable process [7].

4.3 Principle of therapeutic proportionality

This principle holds that there is a moral obligation to implement only those therapeutic measures that have a due proportion between the means employed and the predictable result. Interventions in which

this relationship is not fulfilled are considered *disproportionate* and are not morally mandatory [8].

Therefore, to determine whether or not a medical intervention is morally mandatory in a particular case, a proportional judgment should be performed to assess whether or not a vital support therapeutic means is provided [9]. This process involves evaluating the use of a life-conservation means in a given situation, for example, the use of a respirator in a particular patient in the midst of a pandemic where resources are scarce. And it must occur gradually and dynamically in a climate of dialogue between patient, family and treatment team [10].

According to Calipari, this process consists of three phases:

FIRST PHASE: The assessing of technical and medical aspects of a given therapy is an objective assessment. It allows the moral subject to define whether a means of life conservation is provided or found to be futile if you achieve a *certain* health or life support goal for the patient.

For this assessment Calipari distinguishes two aspects:

- The *medical efficacy* of a life support therapy: it refers to the objective healthy effects that this means.

- The *global efficiency*: it refers to the significant health effects on the patient's life in the general context of his existence [11]. It should be considered that an intervention may have medical efficacy but not overall efficacy for the patient. In this case, the use of this means is not mandatory and is often not indicated.

In this sense, a means of life conservation is proportionate to the extent that it is

adequate, in a given clinical situation, to the achievement of a precise medical goal. This proportionality judgment is the responsibility of the team and results from the assessment of these aspects:

- a) concrete availability or the possibility of finding that means. A therapy that is unavailable or that cannot be found (because of the distances, costs, means, times, etc., which involves finding it), is disproportionate;

- b) the technical possibility of using it; reasonable expectations of medical efficacy;

- c) possible side effects for the patient;

- d) foreseeable risks to the patient's life;

- e) the possibility of resorting to therapeutic alternatives of equal or greater effectiveness;

- f) quantification of the health resources (technical, economics, etc.) necessary for the use of this environment. At this point, Calipari explains that «having a limited amount of resources available it is necessary to rationalize as best as possible its use to avoid harmful waste or injustice that would negatively impact other subjects in need. Therefore, the costs (technical, economics, etc.) required for the use of a life-conservation medium should be assessed in relation to the severity of the pathology to be treated, the urgency of the intervention and the real possibilities of therapeutic success» [11].

SECOND PHASE: this phase takes into account the most subjective aspects from the patient's point of view, that a therapy would be ordinary or extraordinary to him/her. What is ordinary for a patient in a given situation, can be extraordinary for another patient in that same situation.

What factors make a means extraordinary for a patient?

1. Excessive effort to find and/or use that therapy.

2. That the use of this intervention will lead to unbearable physical pain that cannot be sufficiently relieved. We consider that other symptoms or burdens that are unsustainable to the person may also be included here.

3. That the use of the means involves very burden-free economic costs for the patient and the family.

4. That the patient experiences a very important fear in relation to the use of that intervention (this point relates to psychological, emotional, cultural, environmental, etc.)

5. A high probability of a serious risk to the patient's life linked to the use of the medium assessed by the patient himself, will occur in relation to his current clinical situation.

6. A low overall effectiveness rate relative to reasonably expected benefits.

7. That the use of the therapy produces in the patient clinical conditions that prevent him from fulfilling moral duties that he considers serious, for example a pharmacologically induced coma.

THIRD PHASE: based on the previous two phases, you can define whether a therapy is:

Proportionate and ordinary	Ethically required
Proportionate and extraordinary	Optional
Disproportionate and ordinary	Generally illicit. It is an exception if the preservation of life brings any benefits to the patient even if it is minimal and represents for the patient the only way to fulfill a very burdensome and impossible moral duty for him/her.
Disproportionate and extraordinary	Always illicit

5. Algorithm development: decision-making in the absence of resources available in a pandemic situation

The COVID-19 pandemic has created resource scarcity in different countries. Even in nations in the first world high de-

mand and urgency have exceeded at times the availability of beds and respirators. In many situations, this led to some patients in need not having access to certain resources.

The mentioned scarcity, is one of the main factors of psycho-emotional stress

and physical exhaustion in health teams in a context of high demand always present in a pandemic.

1. At the beginning of the pandemic, colleagues from Oxford University, Savulescu et al, designed an ethical algorithm for rationing life-sustaining treatment during COVID-19 [12], based on the utilitarian ethical approach for decision making. This algorithm set out two levels of allocation: The Resource Adjusted Probability Ratio (RAPR) explained as follows: First level allocation (*save the most lives*), resources should be distributed to bring about the most good (the moral requirement to save the greatest number ('*greatest good to the greatest number*')), and the authors agree that in practice the mentioned aim entails saving those patients with a higher probability of surviving. It also requires evaluating the circumstance of Expected Resource Demand (Estimated duration of the treatment /Average duration of treatment).

2. Second level allocation (*selection of which patients to save*). For this purpose, authors set out four different *possible* policy options once patients made it through the first level allocation as follows:

- i. Lottery: *first come first served*.
- ii. Second Triage: the assessment of predicted *length* and *quality* of life (QUALY)
- iii. Priority: according to utilitarian or specially deserving-based grounds, i.e. healthcare workers who have contracted COVID-19 in course of their work; younger patients just because they have enjoyed less life (on grounds of deserving special consideration).

- iv. Fixed-term trial of treatment: some consideration of equality of opportunity

The mentioned RAPR Algorithm proposed by colleagues from Oxford offers a very interesting comparison between International Guidelines for decision-making as SIAARTI (Italia), NICE (UK), New York State Task Force on Life and the Law, and the University of Pittsburgh. This work becomes of great value as it makes a comparative review of the different documents, setting out in each of them, first level triage (probability of survival, duration of therapy required) and second level principles (tie breaking or supplementary: life years quality, priority to health workers or the young, equal share, time limited trial, equal chance lottery or first come first served). This illustrative review helps one's understanding of common perspectives among the mentioned pandemic allocation guidelines – based on the moral limitations of the chosen utilitarian solving method. The limitations of the utilitarian method are clearly visible because moral considerations are unavoidable in human-centered decision-making and cannot be removed.

A more recent publication by authors from the Pontifical Catholic University of Chile [13], explains the *fallacy of the last bed dilemma*. In the mentioned paper, proper decision-making at both public health and healthcare levels is being explained by the necessity of focusing on proportional and ordinary treatments decision-making solutions rather than following a purely utilitarian approach, as utilitarian judgments imply only a single principle – the maximization of utilities. Therefore, in utilitarianism, actions are said to be good or bad

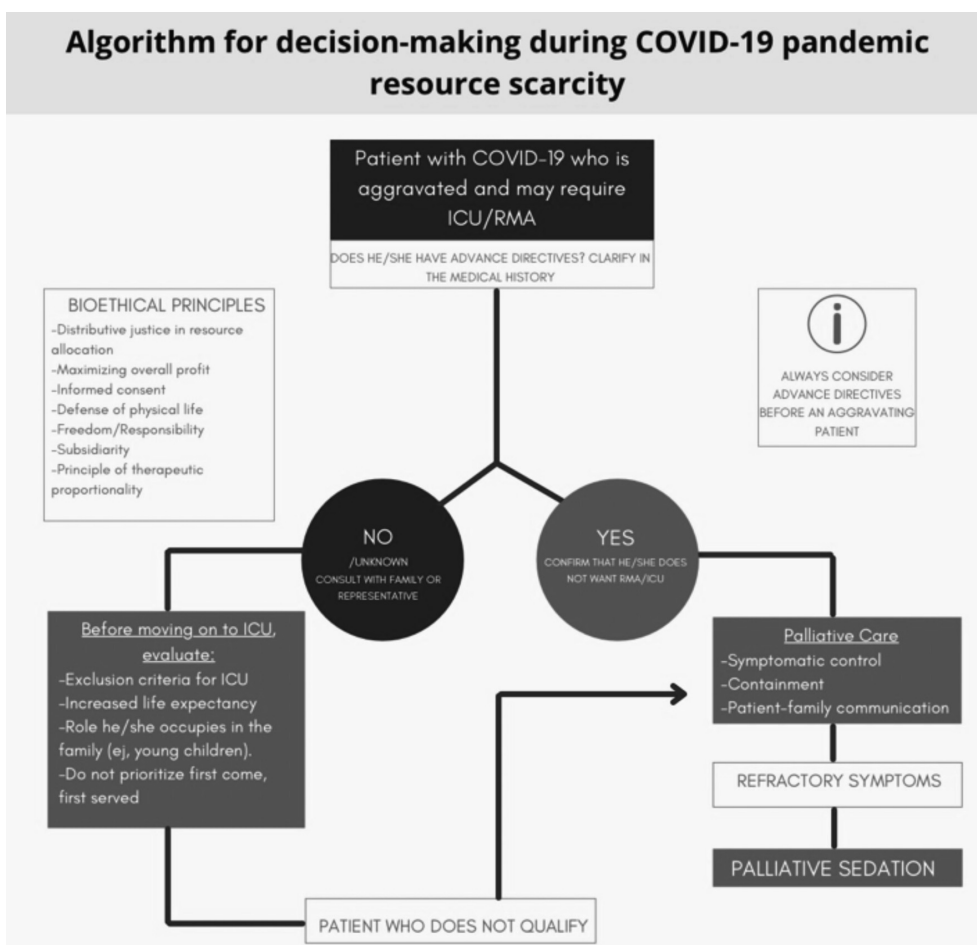
not for intrinsic reasons, but for their *relative* position in the utility ranking *set forth*.

In view of this problem that has ethical implications, we rely on an algorithm based on a person-centered ethical analysis (PCEA) for decision making. Three versions of it were produced until it was published in the Argentine Association of Medicine and Palliative Care [14]. Here's a revised version that includes a modification based on updating the 2016 Critical Medicine Society Guides (Tab. 1):

As we mentioned beforehand, when faced with a patient with COVID it is important to actively involve him/her in decision-making without coercion and obtaining participation from his/her family with the patient's consent.

It is recommended, whenever possible, to consider in advance with the patient the possibility of moving into the ICU or requiring mechanical respiratory assistance (MRA) in case of aggravation, generating a space where he/she can reject that option

Table 1



or not after due consideration. This decision should be facilitated by a health team that knows the potential benefits or not of these interventions in the particular patient. Communication should be careful and attentive to each patient's emotional responses and the desire to actively receive information respecting also the wishes of those who prefer that information be given to a surrogate. It is desirable that the whole decision-making process be based on the medical history.

This situation involves the health team considering whether the patient is a good candidate to move to an ICU and eventually receive MRA. To do this, the treating team can be guided by various criteria. The Society of Critical Care Medicine has classically established four priority criteria in patients to enter an ICU [15] collected by the American College of Critical Care, who published the admission and triage guidelines in the ICU on the basis of which patients are classified into four priority levels [15].

However, in 2016 the Society of Critical Care Medicine released an update to those guidelines where it sets five levels of priorities, including in priority 5 those patients with criteria to receive palliative care [16].

Based on these levels it can be established that patients with *priority 1* are those who require intensive monitoring, who qualify for MRA and therefore to move to an ICU. These are critical organ failure patients who require treatments that can only be provided in an ICU (for example patients with shock or severe hypoxemia).

On the other hand, are those patients with *priority 2* who, although they require intensive monitoring, do not qualify to re-

ceive MRA. These are patients with low chances of recovery and who do not have CPR indicated in the event of cardiac arrest (for example, fragile patients such as the patient with dementia, elderly persons and ones with multiple comorbidities).

Priority 3 patients are those with organic dysfunction that requires intensive monitoring and noninvasive ventilation which can be treated in an intermediate therapy unit. For example, patients with respiratory failure who tolerate noninvasive ventilation. If their situation worsens, these patients could be candidates for an ICU.

Patients with *priority 4* have the same conditions as patients with priority 3 but have less chance of recovery. They are not candidates to receive MRA or CPR (for example, patients with remote oncology disease). They qualify to enter an intermediate therapy unit and in special circumstances, they could be cared for in the ICU if there were no beds available in the intermediate therapy unit.

There are also specific and general exclusion criteria to consider for the decision whether or not to admit patients into the ICU based on pathologies and specific clinical conditions (see algorithm below). These can be applied to patients with priority 2, 3 and 4:

1. General criteria:
 - a) patients with poor prognosis,
 - b) patients who require resources that cannot be provided
2. Specific criteria:
 - a) recurrent cardio-respiratory arrest,
 - b) severe base cognitive impairment (advanced dementia),
 - c) advanced neuromuscular disease without the possibility of treatment,

- d) metastatic malignant disease,
- e) advanced and irreversible immunosuppression,
- f) severe or irreversible neurological event.

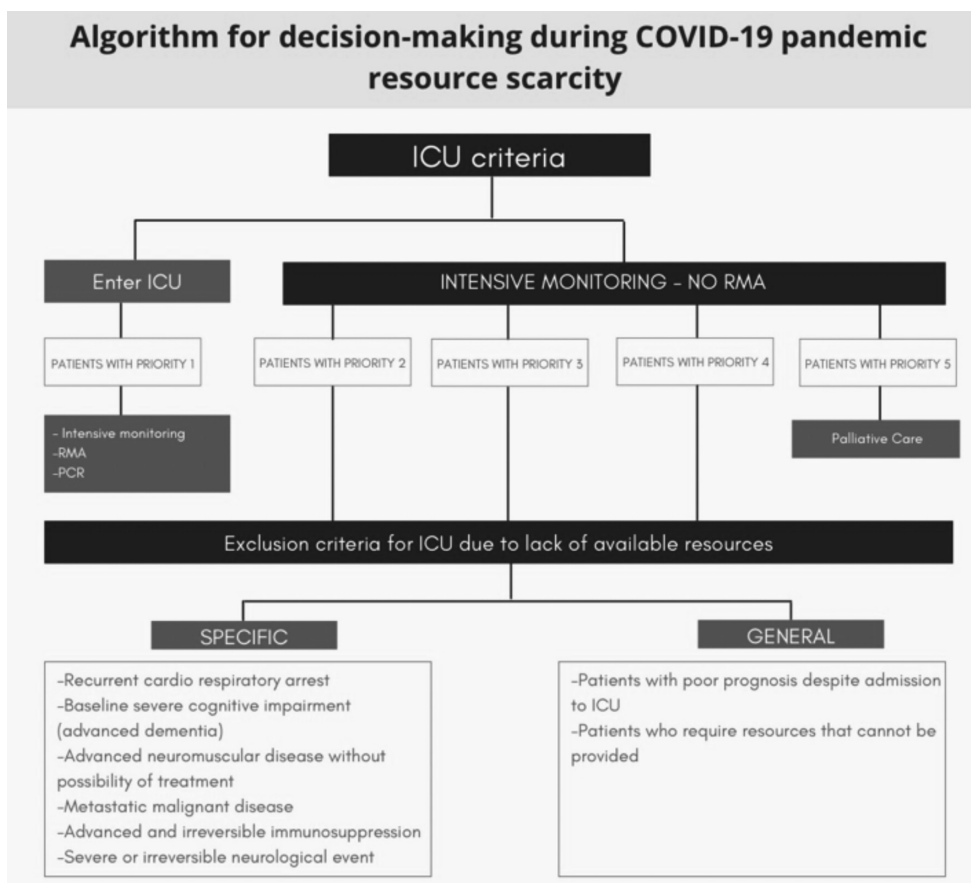
Finally, *priority 5* patients are at an advanced stage of a life-threatening disease and have already been excluded from specific treatment (are monitored by palliative care exclusively). These patients do not qualify for ICU treatment.

In patients with priority 4 and 5, the goals are focused on providing the best supportive care, focused on optimizing com-

fort and quality of life. The association between therapeutic adequacy (non-intubation/cardiopulmonary resuscitation) and lower quality of care is frequent and the fear of suffering from uncontrolled symptoms (such as dyspnea). For this reason, it is important to reassure the possibility of these cares to the patient and the family.

The basic training of all health professionals in addressing the symptomatic control of patients in the final stage of their lives, minimizes both: the suffering of the patient and his family, and the psycho-emotional stress of the team (Tab. 2).

Table 2



If the patient does not meet the necessary criteria for admission to intensive care in situations of lack of resources, it is necessary to explain the situation and provide him/her with palliative care, which allows for adequate symptomatic control [17], containment and also promote patient communication with both, family and the health team [18]. In the presence of refractory symptoms, the use of palliative sedation will be offered [19; 17].

Conversely, if the patient meets the criteria for admission to an ICU but there is no bed available at the institution, it is necessary to evaluate his/her transfer to other institutions where resources are available. If in other centers there are no resources and given the impossibility of referral, it is necessary to inform the patient and his family of this situation and provide follow-up by the palliative care team [20].

In the event that the patient is admitted to the ICU, it is necessary to consider their daily evolution through scores that allow the evaluation of their clinical situation and predict mortality from COVID-19: SOFA [21], APACHE II [22], etc. Continuous monitoring makes it possible to evaluate whether the treatment is beneficial, or if complications appear that make a bad evolution predictable. In the case of patients with chronic diseases, a tool to consider for the evolution of prognosis is NECPAL [23].

In all cases of the previous sections, invasive mechanical ventilation could be removed according to the evolution of the daily SOFA, the complications that occurred and establishing a judgment of futility on a case-by-case basis [24].

Given the possible evolution of compli-

cations and poor evolution, it is reasonable to consider the limitation of therapeutic effort when the treatments in place are proving futile. In this case, palliative care should again be offered to the patient and his/ her family (Tab. 3):

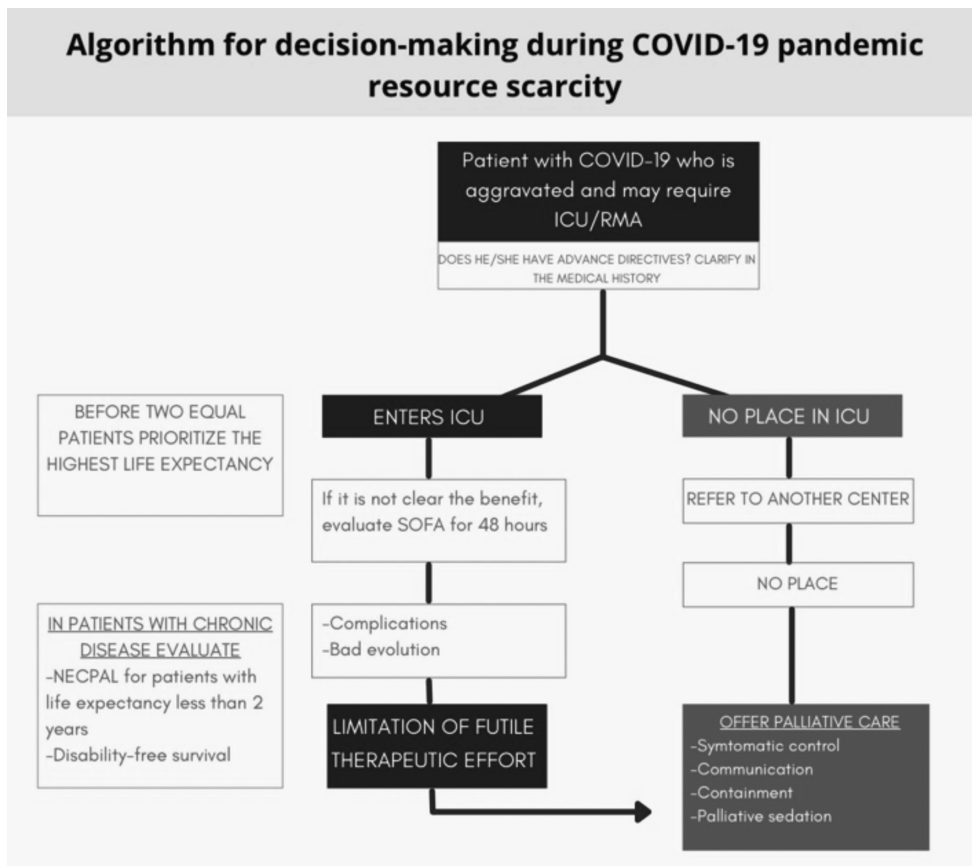
6. How to solve the dilemma of choosing between two patients with similar characteristics if there are no beds available in intensive care?

The application of the triage criteria in this context is justified only after every effort has been made to increase the availability of resources, especially intensive care beds. That is why it is a priority to carry out a strategy that allows the necessary resources to be found as effectively as possible so that their scarcity produces minimal impact [24].

Given the possible situation of lack of beds in an ICU and that it is necessary to choose between two patients with similar characteristics, it is necessary to assess the patient globally and not the disease in isolation. Following aspects must be considered:

- age, comorbidities, status of functioning of organs;
- reversibility;
- advance directives, living wills;
- disease-free life expectancy, with quality of life;
- social aspects (the role the patient occupies in the family, if he/she is the breadwinner, if he/she has small children in his care, etc.);
- it would not be correct to select patients on a first-come, first-served ba-

Table 3



sis, since it is necessary to consider the particular situation of each in a comprehensive manner;

- in older people, disability-free survival should be taken into account over isolated survival;
- in cases where the potential benefit of the introduction of invasive treatments is not clear, they will be admitted conditionally with a clinical evolution after the first 48 hours, assessing organ failure as measured by the SOFA score at admission and reasses-

sing the evolution measured by this scale 48 hours after receiving full support treatment;

- carefully assess the benefit of admitting patients with a life expectancy of less than 2 years using NECPAL tool or similar.

Given the situation of lack of available beds, it is necessary to promote those procedures that facilitate the weaning of MRA according to evidence-based medicine and streamline the circuits of transfers to ordinary hospital care and referral centers to be

able to free up resources for other patients. In case of complications or an expected poor evolution, both clinical and functional, propose therapeutic withdrawal without delay for reasons of futility and initiate the implementation of palliative measures.

7. Conclusions

The health crisis caused by the COVID-19 pandemic, has frequently caused situations of moral distress for members of health teams, for example, feeling unable to do the right thing, since the lack of resources leads to making decisions in extreme conditions, and not always being able to deliver the best medical care to each patient.

This emergency situation also poses new challenges to the modality of palliative care delivery. One must rethink strategies aimed at providing adequate symptom control and psycho-socio-spiritual support. Critical situations of high emotional impact and complex decision-making have taken place in difficult circumstances. Sometimes the patient and family are spoken to using technology like phones or computers, and at other times communication is hampered by the wearing of Personal Equipment (PPE) that does not allow an adequate human contact to take place.

Therefore, it is necessary to develop guidelines for decision-making in the midst of the health crisis we are undergoing to be able to provide an ethical response to the changing needs that arise and to offer quality care based on person-centered medicine, taking into account its undeniable biopscho-socio-spiritual dimensions.

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