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Ethical aspects of the COVID-19 crisis: How to deal with an overwhelming shortage of acute beds

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Abstract

The current outbreak of SARS-CoV-2 has and continues to put huge pressure on intensive care units (ICUs) worldwide. Many patients with COVID-19 require some form of respiratory support and often have prolonged ICU stays, which results in a critical shortage of ICU beds. It is therefore not always physically possible to treat all the patients who require intensive care, raising major ethical dilemmas related to which patients should benefit from the limited resources and which should not. Here we consider some of the approaches to the acute shortages seen during this and other epidemics, including some guidelines for triaging ICU admissions and treatments.

Keywords

Triage, distributive justice, communication, catastrophe, epidemic

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Introduction

The current outbreak of SARS-CoV-2 and the huge associated number of cases of COVID-19 is leading to increasing pressure on hospitals in general and intensive care units (ICUs) in particular around the globe. The number of admissions to ICUs is expected to continue to increase in many countries for some time to come. About one-tenth of patients with COVID-19 will require some form of ventilatory support (invasive and non-invasive) on ICUs that are already (almost) full under normal circumstances. The lesions of COVID-19 are potentially reversible, so that efforts to support patients must be sustained. But the acute course of the disease can last many days and even weeks, so that bed occupancy is often prolonged, resulting in a critical shortage of ICU bed availability and ventilators.

The acute shortages of ICU beds, facilities and staff raise multiple ethical dilemmas related to how best to share the available resources to ensure the best possible outcomes for as many as possible. Here we will consider some of the difficult ethical decisions we are all facing.

The basic principles

In principle, ICUs should be reserved for patients who treating clinicians believe can be expected to recover with a good quality of life. Admitting patients who are going to die, regardless of any medical effort, is not acceptable (Figure 1). Similarly, patients who are not very severely ill and do not really require 'intensive care' should not be admitted. Discharge from the ICU earlier than usual may also be encouraged, especially when some form of respiratory support can be continued outside the ICU. Intensive care admission can thus be denied or discharge advanced for some patients who are most likely to die and also for patients who are likely to do well. In a crisis situation, as at present,

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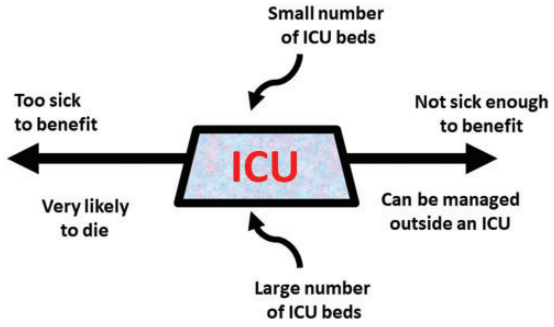

Figure 1. Optimal utilization of intensive care unit (ICU) beds.

these two extreme ends of the spectrum will expand, thus effectively increasing the numbers of available ICU beds (Figure 1).

When the situation becomes really critical, the key ethical principle of distributive justice may apply and can help guide appropriate allocation of the limited healthcare resources. The principle of distributive justice in this context relates to the fair and equal distribution of healthcare resources to all who need them, taking into account society as a whole and not individual patients. When resources are scarce, distributive justice supports their distribution to those most likely to benefit. Very importantly, this does not mean the patients who are most likely to survive, as many of those could be managed outside the ICU.

Catastrophes and epidemics are not the same

The same rule of reserving ICU beds for the most likely to benefit also applies in other conditions of disaster medicine. However, although the pandemic situation is similar in many aspects to disaster medicine, there are five important differences between a single catastrophe (for example, an explosion in a factory, a train crash, a collapsed building) and an epidemic:

1. In a catastrophe, the number of patients is generally known and fixed at a relatively early stage although of course some patients may deteriorate later. The number of beds likely to be needed is therefore fairly easy to predict. In epidemics, it is difficult to predict how many patients will become infected and need ICU admission.
2. In a catastrophe, there is a one-off trigger event and the acute situation is limited in time. Some patients may deteriorate over subsequent days, but these are usually limited in number, and this is not generally a major challenge. The amplitude of the problem is quickly appreciated. In epidemics, patients continue to be infected over a prolonged, and generally difficult to predict, period of time, with initially small numbers of cases increasing often rapidly over a period of days, weeks or even months.
3. In a catastrophe, healthcare staff are generally not affected and there are many who can be called in to help. In epidemics, some of the specialized personnel will also become ill or need to be quarantined and, over time, it can be increasingly difficult to replace them.
4. In a catastrophe, patient transfer is usually possible from one centre (often the hospital or clinic closest to the catastrophe) to other more specialized centres. In epidemics, this is particularly difficult because of the extra hygiene measures necessary to protect staff and other patients and the fact that most, if not all, hospitals will be under similar pressure with shortages of staff, beds and equipment.
5. In a catastrophe, most hospitals have established disaster plans in place, which are periodically enacted and can be activated immediately. In epidemics that affect several regions or countries sequentially, hospitals may have some time to prepare for the arrival of the epidemic in their country, to already start to reorganize the hospital to free up ICU beds, and to establish rules of triage and approaches to the likely difficult ethical decisions that will be faced. They can also learn from the approaches implemented by other affected countries.

Possible solutions to acute shortages

Increasing ICU capabilities

Fortunately, crises such as the current pandemic remain relatively rare, but this also means that the chances of expansion are limited. The numbers of ICU beds within each hospital are usually relatively small and they are generally well occupied. The obvious solution to lack of ICU bed availability is to somehow increase the number of beds available for critically ill patients (Table 1). This could be achieved by transforming less sophisticated units, such as recovery rooms, coronary care units or stroke units, into ICUs. This raises potential problems, however, related to obtaining sufficient numbers of trained staff for the extra beds. A second option is to perform some interventions normally reserved for the ICU on general wards. There are three types of ICU treatment that cannot be provided elsewhere: mechanical ventilation for acute respiratory failure, renal replacement therapy for acute renal failure and cardiovascular support for acute circulatory failure (shock). In the case of COVID-19, one could consider using some forms of respiratory support, such as high flow oxygen therapy, continuous positive airway pressure or non-invasive respiratory support, outside the ICU, even though

Table 1. Example of a step-by-step, increasingly restrictive triage strategy for ICU admission, including reorganization of some aspects of ICU management.

Phase 1
- Opening of all ICU beds (when some are usually closed, for example for lack of nurses)
- Early discharge of suitable patients to other ward areas (with upgrade in nursing support for these areas if needed/possible)
- Transfer of suitable patients to other units, such as the CCU, the recovery room or the stroke unit
- Help of additional medical staff (e.g. anaesthetists, pneumologists . . .) if necessary
- Maintenance of existing nurse/patient staffing ratios
- Non-admission of patients with very poor prognosis (e.g. extensive intracranial bleeding, profound postanoxic coma)

Phase 2

Add:
- Expand the numbers of ICU beds – transform the CCU, recovery room or stroke unit into an ICU
- Cancel elective surgery
- Increase logistic support (help from other floors, reserve-trained ICU nursing/medical staff . . .)
- Help from additional nursing staff (coordinated by ICU nursing staff)
- Cancel holidays (annual/scientific) for medical and nursing staff
- Age limitation (e.g. >85 years), unless very good quality of life
- No admission of patients with poor prognosis (e.g. extensive cancer, terminal cardiac or respiratory failure)

Phase 3

Add:
- Further recruitment of reserve-trained ICU nursing/medical staff
- Additional help from nursing/medical staff from other sectors
- Addition of ICU beds in the corridors or other places
- Further age limitation (e.g. >80 years), unless very good quality of life
- No admission of other patients with a poor prognosis (decompensated cirrhosis, advanced cardiac or respiratory failure)

ICU: intensive care unit; CCU: coronary care unit

there is a risk if staff are not familiar with these techniques or trained to use them.

Triaging ICU admissions and treatments

Triaging is already used in most ICUs worldwide to limit unnecessary ICU admissions, but in times of acute bed shortages has an even greater role to play. However, triaging must be appropriate and follow carefully defined and documented rules.

The priority is not the patients who are most likely to survive.

The whole concept of triaging in this situation is to maximize benefit gained from ICU admission. Patients who are most likely to survive may not even need ICU admission and could be cared for effectively on general wards. Criteria for ICU admission that need to be considered include the severity of the acute disease, the presence of comorbidities, the degree of chronic organ failure and the potential for recovering a reasonable quality of life.

The triage decision process must therefore take a number of factors into account:

1. Of course, the age of the patient is an important element, but it is clearly not the only one that should be considered. An elderly patient who is independent and active, with no previous medical conditions, may take precedence over a younger individual with advanced cancer, severe heart failure or alcoholic cirrhosis. Indeed, life expectancy is perhaps more important than age: excluding patients with a predicted life expectancy <1 year could be considered.
2. Frailty is an important element. Past history and comorbidities, including the degree of chronic organ failure, must be taken into account.
3. Individual preferences should also be taken into account and should be discussed early in the disease process whenever possible, regardless of whether there is an explicit advanced care plan.

Table 2. The general principles of distributive justice.

May be taken into account
Age – life expectancy
Comorbidities
Advanced underlying illness
Expected quality of the benefit
Resources (costs) associated with achieving the benefit
Must not be taken into account
The value of the individual (VIP, artist, scientist, politician . . .)
Wealth/financial support to the institution
Moral values
Friend/family relation
Kindness/empathy
First come, first served
Lottery

Other patients than those with COVID-19 may also need intensive care. It is important not to become so focused on COVID-19 that the treatment of patients who also need ICU care but do not have the disease is compromised. There is a real risk of 'forgetting' patients who are not directly affected by the ongoing epidemic, but whose survival may be reduced by the interruption of planned elective surgical interventions, outpatient clinics and reduced availability of ICU resources. The same rules for admission and discharge must apply to all patients (Table 2).

The concept of first come, first served should not apply. There cannot be a 'first come, first served' strategy. This approach may result in intensive care being withheld from a new patient because the bed is occupied by another patient who is predicted not to survive with a meaningful quality of life even with maximum treatment.

Every admission to the ICU, even outside the epidemic crisis, can be considered as an 'ICU trial'.[1] The appropriateness of life-sustaining treatments should be re-evaluated on a daily basis, taking into account all patient-related factors, including the clinical course, complications and response to treatment. Patients, their families and staff members must all be clearly informed of this strategy.

The decision to remove a patient from a ventilator or to discharge them from the ICU to free the bed to provide for others who could benefit more is justifiable[2] and patients and their families should be made aware of this possibility at the time of admission. Withdrawing ventilator support from a patient in order to use the equipment to try and save someone with a better prognosis can be extremely difficult for healthcare staff involved in the patient's care and distressing for their families. However, in such situations, this should not be considered as an act of killing and does not require patient consent; such decisions are ethically permissible.[3] Careful triage from the very start of such an epidemic, with allocation of beds and ventilators taking into consideration the need to maximize benefits for all, could help reduce the later need for withdrawal.

Some have suggested that, in cases of comparable medical urgency, selection based on 'random' criteria or lottery may be the fairest, but we would avoid this option as much as possible, because good clinical appraisal should generally prevail over chance. Nevertheless, relying on clinical judgment alone when making such decisions may not be adequate[3] and to increase objectivity, the use of scoring systems has been suggested. The Sequential Organ Failure Assessment Score was proposed as a triage tool in previous epidemics, with patients with very low or very high scores given low priority for ICU admission,[4] and is being used by some institutions in the current pandemic. A Clinical Frailty Score[5] could also be calculated, as has been recommended by the National Institute for Health and Care Excellence in the UK.[6] These scores, combined with other factors including clinical evaluation, age and comorbid conditions, could potentially be used to create a priority score to guide limited resource allocation.[7] Working closely with other medical disciplines, including geriatric medicine, can help in these complex decisions.

The same discussions apply to the use of extracorporeal membrane oxygenation (ECMO), when the ICU staff trained to use it and/or the number of machines is restricted. ECMO can save lives in some of the most seriously ill COVID-19 patients, but is the most resource-consuming treatment that we can offer in the ICU. As such, it should be reserved for very carefully selected patients, and ideally only be available in high-volume referral centres. Importantly, there may be a conflict between the provision of such very advanced care to a very limited number of patients versus the need to provide less advanced care to more patients. This is a difficult ethical balance.

Role of the ICU leader in triage. Triage decisions during epidemics are difficult and can be emotionally draining. ICU staff are not familiar with or well prepared for the need to triage patients according to likely or expected benefit. The ICU team, already faced with new hurdles related to complex additional hygiene and protection measures, must also learn how to deal with the very difficult ethical decisions associated with insufficient availability of ICU beds and equipment. Hospital staff are often even less prepared for such decision making and all healthcare staff must be supported when having to make such difficult decisions.

Triage rules must therefore be based on a clear set of rules that are as explicit as possible and are developed according to local circumstances and resources. Such rules may, of course, vary over time as the situation worsens or improves, and should be reevaluated regularly. Even with carefully developed protocols, however, uncertainties will remain. At the peak of such epidemics with large numbers of patients needing admission on a continuous basis, there is also no time to have prolonged discussions about these decisions. As such, it is important that an ICU leader (usually the Head of the ICU or a senior staff physician) who is available 24 hours a day (perhaps on a separate pager just for this purpose) is identified as the ultimate person responsible for triage decisions. Some have suggested a triage committee of two or three respected ICU leaders.[8] The triage leader or committee will be in charge of ICU admission and resource allocation.

Not having explicit rules – or, even worse, not respecting them – can result in a feeling of injustice (with sometimes 'VIP medicine'), waste of time spent on discussions, disagreement and even conflict. The person in charge of triage must treat everybody in all fairness keeping in mind the fundamental principles presented in Table 2. Triage decisions cannot be influenced by the VIP status of a patient, family links to staff members, patient wealth or place in society.

ICU admission policies should be discussed within the department (colleagues and nurses) and outside the ICU (hospital management), so that stakeholders can understand and share the principles and everyone is in agreement to adhere to the decisions. Approval by the hospital management team helps give confidence to and protect the ICU leader from later argument or disagreement. Different stages of triage may be considered as the epidemic progresses (Table 1) and movement from one stage to the next must be clearly communicated to each member of the ICU team. A list of triage decisions should be kept for transparency and later evaluation.

After the crisis

Once the crisis is over, full debriefing is necessary to support and stabilize the teams and to rebuild morale. The list of triage decisions may be revisited and discussed. Psychological support should be offered to all who need it, perhaps particularly those who were involved in triage decisions. Making time to remember colleagues who died as a result of the epidemic is also important. The team should be thanked for all the work and effort. One should share gestures of support and thanks received from the patients and/or their relatives throughout the epidemic, and again once the crisis is over when there is more time to discuss and absorb these aspects.

Later in the post-crisis process, lessons learned (both good and bad) from the epidemic about ICU management must be used to put structures in place to improve the situation for the next catastrophe.

Conclusion

Fortunately, the occurrence of crises such as the current pandemic remains relatively rare, but this makes the decisions associated with allocation of scarce resources even more of a challenge as for many it is unknown territory. This is a very unusual situation, but we have no choice but to rapidly, but carefully, develop rules for triage to ensure ICU beds and life-saving equipment are reserved for those who will be most likely to benefit and survive with a good quality of life. We must be transparent about such decisions among ourselves, but also with patients and their families.

Networking among healthcare professionals is essential during and after epidemics such as this, in order to share experience and expertise. Dedicated time and resources should be spent on regular team debriefing. This can also allow the early detection of burnout symptoms or psychological distress among the healthcare staff. Effective post-crisis debriefing and psychologic support are crucial.

Conflict of interest

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