

COVID-19 pandemic: triage for intensive-care treatment under resource scarcity (revised version 3.1, 17 December 2020)

Swiss Academy of Medical Sciences

Guidance on the application of Section 9.3 of the SAMS Guidelines “Intensive-care interventions” (2013)

This document is available in English, French, German and Italian, cf. sams.ch/en/coronavirus. The German text is the authentic version.

Updated version of 17 December 2020. Former versions were published in the Swiss Medical Weekly in March 2020 (Swiss Med Wkly. 2020;150:w20229, DOI: <https://doi.org/10.4414/smw.2020.20229>) and November 2020 (Swiss Med Wkly. 2020;150:w20401, DOI: <https://doi.org/10.4414/smw.2020.20401>)

I. Background

In March 2020, owing to the rapid spread of the coronavirus (SARS-CoV-2), an extraordinary situation¹ was declared, and, as a result of high case numbers, acute hospitals experienced a massive influx of patients over a period of several weeks. In view of this situation, the Swiss Academy of Medical Sciences (SAMS) and the Swiss Society of Intensive Care Medicine (SSICM) issued guidelines on triage for intensive-care treatment under resource scarcity. In this first wave of COVID-19, the restriction of elective procedures² and an increase in intensive care unit (ICU) capacity (particularly ventilator-equipped beds), together with public health (behavioural) measures ordered by the federal government, were enough to prevent a situation of resource scarcity from arising at the national level. It was therefore not necessary for the SAMS guidelines to be applied.

Given the development of the pandemic in October, it was necessary for the guidelines to be revised in the light of the experience accumulated since March, and an updated version was issued (version 3). There has been no change in the guiding principle that uniform criteria for ICU admission and continued occupancy should be applied throughout Switzerland. The present version (3.1) differs from the preceding versions in that it clarifies and explains the ethical principles which have been applied since March. In addition, it includes an assessment and further consideration of legal aspects. The recommendations for the work and decision-making of ICU professionals are essentially unchanged.

Responsibility of policymakers and society

In accordance with the statement issued by the Swiss Society of Intensive Care Medicine (SSICM) on 17 November 2020³, it is to be noted from an ethical perspective that responsibility for ensuring the availability of ICU capacity does not lie solely with the hospitals that offer such facilities; these efforts rely on the participation and shared responsibility of society and policymakers. This means it is essential for control measures to be ordered, implemented and complied with, that support the health system as effectively as possible and relieve pressure on capacity.

National coordination of patient transfers

In collaboration with various health system actors, the Co-ordinated Medical Services of the Swiss Armed Forces has established a system for national coordination of ICUs. A central coordination body is to ensure that optimum use is made of all ICU treatment capacity available across Switzerland.⁴

Threshold for triage decisions

As specified in the document “National coordination in the event of a massive influx of patients to ICUs during the COVID-19 pandemic”⁵, responsibility for patient triage lies with the individual hospital/ICU. At the same time, the obligation of hospitals and ICUs to admit patients is limited by the capacity available. The SAMS and the SSICM hereby propose that the national coordination body should be responsible for determining at what point the situation in Switzerland is such that triage decisions – in accordance with the criteria set out here – are unavoidable. This would ensure that the best possible use is made of resources across Switzerland before triage decisions are required at individual hospitals.

The coordination body should also be responsible for deciding on the threshold at which the application of these guidelines is to be triggered at the national level. If this threshold has not been reached nationally, but an acute scarcity of ICU capacity exists at the local or regional level and neither transport nor admission to another ICU is possible – despite an increase in ICU beds, the suspension of elective procedures and the involvement of the national coordination body for patient transfers – then these guidelines are to be applied *mutatis mutandis* at the local

or regional level. The SAMS and the SSICM recommend that hospitals should inform the national coordination body about the application of the guidelines.

The guidelines will be adapted by the SAMS and the SSICM if experience in practice and new scientific findings so require. The latest version is available at: sams.ch/en/coronavirus

II. Guidelines

1. Applicability

These guidelines concerning the criteria for ICU triage are applicable for the point in time at which resource scarcity arises and rationing decisions have to be made. They are applicable to all patient categories. Patients with COVID-19 and other patients requiring intensive care are treated according to the same criteria.

The guidelines supplement the SAMS Guidelines “Intensive-care interventions” (2013). Accordingly, in the event of resource scarcity, they will apply only to a small proportion of patients, namely the group of severely ill patients requiring intensive care. The guidelines are to be applied by intensive care professionals, in consultation – depending on the context – with specialists in other disciplines such as emergency medicine, internal medicine or palliative care.

2. Fundamental ethical principles⁶

The four widely recognised principles of medical ethics (beneficence, non-maleficence, respect for autonomy and equity) are also crucial under conditions of resource scarcity. It is important that the patient’s wishes with regard to emergency treatment and intensive care are ascertained at an early stage, especially for individuals belonging to a risk group. Scarce resources must never be employed for treatments that a patient does not wish to receive.

If the resources available are insufficient to enable all patients to receive the ideally required treatment, then these fundamental principles are to be applied in accordance with the following rules of precedence:⁷

Equity: Available resources are to be allocated without discrimination – that is, without unjustified unequal treatment on grounds of age, sex, residence⁸, nationality, religious affiliation, social or insurance status, or disability. The allocation procedure must be fair, objectively justified and transparent. In a situation of acute scarcity of ICU beds, equal dignity is still to be accorded to each individual. If intensive care cannot be provided, alternative treatment and care options – in particular, palliative care – are to be made available.

Preserving as many lives as possible: In the event of acute scarcity of ICU beds, all measures are guided by the aim of minimising the number of deaths. Decisions should be made in such a way as to ensure that as few people die as possible.

Protection of the professionals involved: These individuals⁹ are at particular risk of infection with the coronavirus. If they are unable to work owing to infection, more deaths will occur under conditions of acute resource scarcity. They are therefore to be protected as far as possible against infection, but also against excessive physical and

psychological stress. Professionals whose health is at greater risk in the event of infection with the coronavirus are to be especially protected and should not be deployed in the care of patients with COVID-19.

3. Criteria for ICU triage (admission and continued occupancy) under resource scarcity

These guidelines are intended to support decision-making by professional treatment teams. Triage ultimately involves case-by-case decisions, in which the experience of the team plays a crucial role. In individual cases, in order to elaborate the primary criterion of short-term prognosis, additional medical prognostic criteria may need to be taken into account.

As long as sufficient resources are available, patients requiring intensive care are to be admitted and treated in accordance with established criteria. Particularly resource-intensive interventions should be undertaken only in cases in which the benefits thereof have been unequivocally demonstrated. In a situation of acute resource scarcity, they run counter to the goal of saving the maximum possible number of lives. In such a context, therefore, ECMO¹⁰, for example, should only be used in particular situations, as specified in the SSICM guidelines¹¹, after careful assessment of the resources required.¹²

It is necessary to discuss in advance – with all patients capable of doing so – the patient’s wishes in the event of possible complications (resuscitation status and extent of intensive care). In the case of patients who lack capacity, this involves consideration of their presumed wishes in consultation with their authorised representatives. If intensive-care interventions are withheld, comprehensive palliative care must be provided.¹³ To avoid ICU resource scarcity, it is also crucial that departments and institutions providing care for patients discharged from an ICU (or instead of intensive-care treatment) fulfil their obligations in a spirit of solidarity.

If ICU capacity is exhausted and not all patients who require intensive care can be admitted, **the short-term survival prognosis is decisive** for purposes of triage. For ICU admission, highest priority is to be accorded to those patients whose prognosis¹⁴ with regard to hospital discharge is good with intensive care, but poor without it – that is, the patients who will benefit most from intensive care. The aim is to make decisions in such a way as to save the largest possible number of lives.

Age, disability or dementia in themselves are not to be applied as criteria. This would infringe the constitutional prohibition on discrimination, since people who are older, disabled or suffer from dementia would thereby be accorded less value than others. In general, for patients requiring intensive care, a poor short-term prognosis is not to be automatically inferred from age, disability or dementia alone. If a patient is to be accorded lower priority for intensive care, there must always be specific risk factors for increased mortality and hence a poor short-term prognosis.

A specific risk factor for increased mortality is, for example, **age-related frailty**. In older people, this is correlated with a poor short-term prognosis, and it is therefore a relevant criterion to be taken into account in a situation of resource scarcity. Of the various tools proposed for the eval-

uation of frailty, the best validated¹⁵ is the Clinical Frailty Scale (CFS, cf. [fig. S1](#) in appendix 1).

A disability is not in itself a factor of prognostic relevance; in persons with disabilities, there may, however, be comorbidities that are directly associated with the disability (e.g., respiratory insufficiency in a person with multiple disabilities) or not directly associated (e.g., cancer in a person with quadriplegia). However, in persons with disabilities, dependence on assistance for activities of daily living is not correlated with the short-term prognosis. The CFS is not validated for the assessment of frailty in persons with disabilities and is thus not relevant here. Health status is to be determined in the same way for all persons, irrespective of any disabilities. Any other approach would be discriminatory and is thus to be rejected.

Consideration of additional criteria. In the literature,¹⁶ additional criteria are discussed, such as allocation by lottery, the “first come, first served” principle, and prioritisation of persons expected to have more quality-adjusted life years or deemed socially useful. These criteria are not to be applied.

4. Triage decisions

4.1. Phases

- **On admission:** extent and duration of treatment, determination of pathway (e.g., ICU treatment, intermediate care, palliative care).
- **During the ICU stay:** daily evaluation with regard to continuation of treatment, limitation of treatment intensity or duration, modification of treatment goal and palliative care.

4.2. Admission criteria

The competent federal and cantonal authorities, as well as hospitals with ICUs, are essentially obliged to take all reasonable measures to prevent an acute shortage of ICU capacity. Apart from an increase in the number of ICU beds across Switzerland, the coordination of ICUs (cf. “Background” section I above) and the suspension of elective procedures, this also involves efforts to assess the availability of ICU capacity in collaboration with authorities and hospitals abroad. Conversely, if sufficient resources are available, Swiss ICUs should admit patients from neighbouring countries facing triage situations.

If, in spite of such measures, ICU capacity – including additional external beds – is no longer sufficient, only patients who require mechanical ventilation (or another specific intensive-care intervention, such as haemodynamic support with vasoactive agents or continuous renal replacement therapy) are to be admitted. In such situations, the utmost restraint is to be exercised in the application of cardiopulmonary resuscitation following cardiac arrest – with the exception of situations where an excellent outcome is to be expected.¹⁷

If not all patients requiring intensive care according to the above-mentioned criteria can be admitted to an ICU, decisions need to be made concerning patient admission to, or transfer from, the ICU. These are to be made according to the criteria of **short-term survival prognosis**, as explained in detail below. The criteria are linked to two stages (A

and B), becoming more stringent as capacity pressures increase. All less intensive treatments should be carried out in intermediate (IMCUs) or standard care units.

Stage A: ICU beds available, but national capacity is limited, and there is reason to believe that, within a few days, ICU beds may become unavailable in Switzerland and transfers to ICUs abroad may not be possible to a sufficient extent.

Stage B: No ICU beds available.

4.3. Initial triage: criteria for ICU admission¹⁸

Step 1:

Does the patient have any of the following inclusion criteria?

- Requirement for invasive ventilatory support?
- Requirement for hemodynamic support with vasoactive agents (e.g., noradrenaline-equivalent dose >0.1 µg/kg/min)?
- Requirement for another specific intensive-care intervention (e.g., continuous renal replacement therapy)?

If one of these inclusion criteria is fulfilled → Step 2

Step 2:

Does the patient have any of the following exclusion criteria?

Stage A (cf. 4.2.)

- Patient’s wishes (advance directive, etc.) opposed to ICU treatment
- Age-related CFS score ≥ 7 and age >65
- Age-related CFS score ≥ 6 and age >85
- Unwitnessed cardiac arrest, recurrent cardiac arrest, cardiac arrest with no return of spontaneous circulation
- Severe, rapidly progressive, incurable disease (e.g., neurodegenerative disease or cancer) with high short-term mortality similar to the other patient groups mentioned in Stage A
- Chronic conditions, such as: NYHA class IV heart failure despite optimal treatment; Chronic obstructive pulmonary disease (COPD) GOLD category 4 (D) leading to more than two hospital admissions in one year; liver cirrhosis, Child-Pugh class C; Charlson comorbidity score ≥ 5
- Severe circulatory failure, which, despite management of acute disease, including increased vasoactive dose, is treatment-resistant (hypotension and/or persistent inadequate organ perfusion)

In patients with COVID-19, the 4C Mortality Score may additionally be employed. A score of >15 indicates high mortality.¹⁹

Stage B (cf. 4.2.)

Here, the following additional exclusion criteria are applied:

- Age-related CFS score ≥ 6 and age >65
- Severe trauma with high short-term mortality
- Severe burns with inhalation injury²⁰
- National Institutes of Health Stroke Scale (NIHSS) score >14 after appropriate acute treatment for stroke²¹

- Chronic conditions: New York Heart Association (NYHA) class III or IV heart failure despite optimal treatment; COPD GOLD 4 (D) or COPD A–D with either forced expiratory volume in 1 second (FEV₁) <25% or cor pulmonale or home oxygen therapy (long-term oxygen therapy); liver cirrhosis, Child-Pugh class C, with refractory ascites or encephalopathy > stage I; Charlson comorbidity score ≥4
- Age >75 and at least one of the following criteria: liver cirrhosis, Child-Pugh class B or C; stage IV chronic kidney disease (KDIGO) (estimated glomerular filtration rate [eGFR] <30 ml/min/1.73 m²); NYHA class >II heart failure; age-related CFS score ≥5
- Occurrence of an additional significant organ failure during ICU stay, leading to further deterioration of the short-term prognosis.

In **Stage B** (cf. 4.2), ICU treatment should be discontinued if one of the following criteria applies, even if all three criteria specified in Step 2 were initially met:

- No improvement in respiratory or hemodynamic status (stabilisation is not sufficient)
- Occurrence of cardiac arrest during ICU stay: in Stage B, cardiopulmonary resuscitation should not be attempted
- Presence of persistent or progressive failure of two organs in addition to the lungs

In Stage B, no cardiopulmonary resuscitation is to be performed in the ICU.

4.4. Triage during ICU stay

The following criteria are relevant for the continuation of ICU treatment:

The health status of patients in the ICU is to be assessed daily and interprofessionally.

Here, the medical utility of intensive care is to be evaluated on the basis of the clinical course – partly to allow decisions to be taken regarding a possible transition from curative treatment to palliative care. This applies to all (i.e. both COVID-19 and non-COVID-19) patients receiving ICU treatment when resources are exhausted. The more acute resource scarcity becomes, the more stringently the following criteria are to be applied.

Step 1:

Presence of a criterion for transfer from the ICU:

- Careful re-evaluation of whether continuation of intensive-care treatment corresponds to the patient's (presumed) wishes
- Patient extubated or with spontaneous breathing after tracheotomy → Patient transferred from ICU as soon as possible for further treatment.

Step 2:

Following a period of stabilisation in accordance with the particular condition:

Presence of the following three criteria:

- Stabilisation or improvement of oxygenation and ventilation
- Stabilisation or improvement of haemodynamics
- Stabilisation or improvement of underlying organ dysfunctions

All three criteria must be met for ICU treatment to be continued.

Step 3:

Applicable in Stages A and B:

In **Stage A** (cf. 4.2), ICU treatment should be discontinued if one of the following criteria applies, even if all three criteria specified in Step 2 were met.

- Recurrent cardiac arrest during ICU stay, in spite of initially successful resuscitation;

The presence of one these criteria and the discontinuation of ICU treatment leads to the initiation of palliative care for the patient.

NB: From a legal perspective, there is some uncertainty as to whether deaths occurring as a result of non-admission to, or transfer from, an ICU, in accordance with the criteria specified in these guidelines, are to be recorded as an “unnatural death” (i.e., an unusual death) on the medical death certificate. This uncertainty relates in particular to cases where individuals have to be transferred from an ICU as a result of resource scarcity. In a situation of resource scarcity, in order to achieve the goal of saving as many lives as possible and applying the criterion of short-term survival prognosis, triage decisions have to be taken both for ICU admission and during the ICU stay.

In this regard, the SAMS and the SSICM would welcome legal clarification in the interests of legal certainty for the medical profession. The SAMS and the SSICM currently recommend that the specific circumstances of these deaths should be documented, but that they should not be classified as unusual deaths. This remains subject to orders or decisions made by competent authorities or courts, requiring such cases to be reported as unusual deaths.

5. Decision-making processes

In triage decisions, confidence must be maintained under the most difficult conditions. For this reason, fair prioritisation criteria and fair processes must be transparently applied at all times. Clear reasons for according (or failing to accord) priority must be documented and updated as the situation develops. The same applies to the processes whereby such decisions are made. Individual decisions must be amenable to examination: they must be documented in writing and include a statement of reasons and the name of the person responsible. Any deviation from the specified criteria must be similarly documented. In addition, mechanisms should be in place for subsequent review of conflicts.

The decision-making process must be managed by experienced professionals. Whenever possible, decisions must be made within an interprofessional team, rather than by individuals. Ultimately, however, responsibility is borne by the most senior intensive care specialist present. Bodies providing support for treatment teams (e.g., ethics support, multiprofessional team) may be helpful. However, the ICU must be able to make rapid, independent decisions at any time on patient admissions and transfers. The legal require-

ments²² concerning the duty to provide regular reports on the total number and occupancy of ICU beds are to be complied with.

If, owing to a triage situation, ICU treatment is not offered or is discontinued, this must be communicated in a transparent manner. It is not permissible to justify the treatment decision to the patient on the grounds that such treatment is not indicated, if a different decision would have been taken had sufficient resources been available. The patient with capacity, or the relatives authorised to represent a patient lacking capacity, are to be openly informed about the decision-making process and, if possible, opportunities for further discussion should be offered, possibly supplemented by, for example, hospital pastoral care or psychological support.

III. Footnotes

¹ The Ordinance 2 of 13 March 2020 on Measures to Combat the Coronavirus (COVID-19) (COVID-19 Ordinance 2) (status as of 17 March 2020; since revoked) was based on Article 7 of the Epidemics Act (SR 818.101), which regulates the “extraordinary situation”.

² “Healthcare facilities such as hospitals and clinics, medical practices and dental practices must discontinue all non-urgent medical procedures and therapies” (Art. 10a para. 2 of the Ordinance cited in Footnote 1).

³ COVID-19: *Vollständige Auslastung zertifizierter und anerkannter Intensivbettenkapazitäten* (COVID-19: Certified and recognised ICU capacity fully utilised), dated 17 November 2020.

⁴ Further information and contact details can be found at: <https://www.vtg.admin.ch/de/organisation/astab/san/ksd/nki.html> (accessed on 14 December 2020).

⁵ Only available in German; accessed on 14 December 2020.

⁶ For a more detailed discussion of the ethical principles, see Section 2 of the SAMS Guidelines “Intensive-care interventions” (2013).

⁷ Cf. also Swiss Influenza Pandemic Plan, 2018, Part II, Section 6.1, and especially Part III, Section 6 “Ethical issues”.

⁸ Available hospital beds in intensive care must be reported; cf. Art. 12 of the Ordinance of 19 June 2020 on Measures during the Special Situation to Combat the COVID-19 Epidemic (status as of 12 December 2020).

⁹ Naturally, the same applies for all persons exposed to a higher risk of infection as a result of their work (e.g., retail and pharmacy staff, as well as relatives caring for patients).

¹⁰ Extracorporeal membrane oxygenation.

¹¹ Cf. SSICM, ECMO in COVID-19 related severe ARDS. ECMO Guidelines for non-ECMO Centers, 2020.

¹² Cf. Bartlett et al. 2020.

¹³ Cf. the palliative.ch guidelines: *Therapeutische Massnahmen bei Patienten mit Covid-19 mit zu erwartender ungünstiger Prognose* (www.palliative.ch).

¹⁴ For a more detailed discussion of prognosis, see Section 5.1 of the SAMS Guidelines “Intensive-care interventions” (2013).

¹⁵ Cf. Hewitt et al. 2020.

¹⁶ Cf., for example, Persad et al. 2009.

¹⁷ Cf. the recommendations of the Swiss Society of Emergency and Rescue Medicine (SSERM): Prehospital triage and care under resource scarcity in the hospital sector (particularly in intensive care) during the COVID-19 pandemic, see www.sgnor.ch/home/covid-19

¹⁸ Cf. Christian et al. 2006.

¹⁹ Knight et al. 2020.

²⁰ The justification for this criterion is the highly resource-intensive treatment required by patients with severe burns. In decision-making, the individual patient’s short-term survival prognosis is to be carefully considered and an assessment is to be made in accordance with capacity at the two Burn Units (USZ and CHUV).

²¹ Cf. Li et al. 2020.

²² Cf. the Ordinance of 19 June 2020 on Measures during the Special Situation to Combat the COVID-19 Epidemic (status as of 12 December 2020).

²³ Cf. Flaatten et al. 2017; Muscedere et al. 2017; Rockwood et al. 2020; Surkan et al 2020.

IV Information on the preparation of these guidelines

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The SAMS and the SSICM thank the numerous other experts who commented on these guidelines and provided valuable input.

Approval

The guidelines – approved by the Central Ethics Committee (CEC), the Executive Board of the SAMS and the Board of the Swiss Society of Intensive Care Medicine (SSICM) – came into effect on 20 March 2020. The revised version 3.1 was approved by the CEC, the Executive Board of the SAMS and the Board of the SSICM on 11 December 2020.

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Appendix 1


The Clinical Frailty Scale assists health professionals in assessing short-term survival prognosis in elderly patients. Its prognostic value is confirmed by numerous publications.²³ At the same time, limited evidence is available concerning the most appropriate thresholds, which means


that the scale needs to be used carefully, in combination with good clinical judgement on the part of the professionals concerned. The scale is to be employed by appropriately trained health professionals; training materials are available online at www.dal.ca/sites/gmr/our-tools/clinical-frailty-scale.html.


Figure S1: Clinical Frailty Scale (CFS).


Clinical Frailty Scale*


 **1 Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.


 **2 Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.


 **3 Managing Well** – People whose **medical problems are well controlled**, but are **not regularly active** beyond routine walking.


 **4 Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities**. A common complaint is being "slowed up", and/or being tired during the day.

 **5 Mildly Frail** – These people often have **more evident slowing**, and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

 **6 Moderately Frail** – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.

 **7 Severely Frail** – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

 **8 Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

 **9. Terminally Ill** - Approaching the end of life. This category applies to people with a **life expectancy <6 months**, who are **not otherwise evidently frail**.

Scoring frailty in people with dementia


The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
 2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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