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COVID-19 pandemic: triage for intensive-care treatment under resource scarcity

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

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I. Background

Owing to the rapid spread of the coronavirus (SARS-CoV-2), an extraordinary situation has been declared¹, and acute hospitals will therefore be confronted with a massive influx of patients. Initially, this can be absorbed by the restriction of elective procedures², the transfer of patients to intermediate care units (IMCUs), an increase in ventilator-equipped beds, and the avoidance of personnel-intensive treatment options. However, if insufficient resources are available, rationing decisions will become necessary, placing considerable burdens on medical staff. This makes it all the more important that uniform criteria for intensive-care unit (ICU) admission and continued occupancy should be applied throughout Switzerland. The present guidelines provide the necessary basis.

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

¹ The Ordinance on Measures to Combat the Coronavirus (COVID-19) (COVID-19 Ordinance 2) of 13 March 2020 (Status as of 16 March 2020) is based on Article 7 of the Epidemics Act (SR 818.101), which regulates the «extraordinary situation».

² Cf. COVID-19 Ordinance 2, Art. 10a para. 2: Healthcare facilities such as hospitals and clinics, medical practices and dental practices must discontinue all non-urgent medical procedures and therapies.

II. Guidelines

1. Applicability

The following guidelines 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» and thus concern only a small proportion of patients infected with the coronavirus, namely the group of severely ill patients requiring intensive care.

2. Fundamental ethical principles³

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. On no account are scarce resources to be employed for treatments which 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:⁴

Equity: Available resources are to be allocated without discrimination – i.e. without unjustified unequal treatment on grounds of age, sex, residence⁵, nationality, religious affiliation, social or insurance status, or chronic disability. The allocation procedure must be fair, objectively justified and transparent. With a fair allocation procedure, arbitrary decisions, in particular, can be avoided.

Preserving as many lives as possible: Under conditions of acute scarcity, 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 as possible become severely ill or die.

Protection of the professionals involved: These individuals⁶ 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 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 For a more detailed discussion of the ethical principles, see Section 2 of the SAMS Guidelines «Intensive-care interventions».

⁴ Cf. also Swiss Influenza Pandemic Plan, Strategies and measures to prepare for an influenza pandemic, 5th edition 2018, Part II, Section 6.1, and especially Part III, Section 6 «Ethical issues».

⁵ Available ICU beds must be reported via the information and deployment system (IES) of the Coordinated Medical Services: www.vtg.admin.ch/de/organisation/astab/san/ksd/mehr-zum-ksd/ueber-den-ksd.html

⁶ 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).

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

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 only be undertaken in cases in which the benefits thereof have been unequivocally demonstrated. ECMO⁷ should not be used in patients with COVID-19.⁸ ECMO may, however, still be used in justified cases and after careful assessment of the personnel resources required.

It is important to discuss in advance – with all patients capable of doing so – the patients' wishes in the event of possible complications (resuscitation status and extent of intensive care). If intensive-care interventions are withheld, comprehensive palliative care must be provided.⁹

If ICU capacity is exhausted and not all patients who require intensive care can be admitted, **the short-term prognosis is decisive** for purposes of triage. For ICU admission, highest priority is to be accorded to those patients whose prognosis¹⁰ with regard to hospital discharge is good with intensive care, but poor without it – i.e. the patients who will benefit most from intensive care.¹¹

Age in itself is not to be applied as a criterion, as this would be to accord less value to older than to younger people, thus infringing the constitutional prohibition on discrimination. Age is, however, indirectly taken into account under the main criterion «short-term prognosis», since older people more frequently suffer from comorbidity. In connection with COVID-19, age is a risk factor for mortality and must therefore be taken into account.

Consideration of additional criteria. In the literature¹², additional criteria are discussed, such as lotteries, «first come, first served» and prioritisation according to social usefulness. These criteria are not to be applied.

⁷ Extracorporeal membrane oxygenation.

⁸ Cf. MacLaren G, Fisher D, Brodie D. Preparing for the most critically ill patients with COVID-19. The potential role of extracorporeal membrane oxygenation. JAMA, published online, 19 February 2020.

⁹ Cf. the palliative.ch guidelines: [Therapeutische Massnahmen bei Patienten mit Covid-19 mit zu erwartender ungünstiger Prognose](#).

¹⁰ For a more detailed discussion of prognosis, see Section 5.1 of the SAMS Guidelines «Intensive-care interventions».

¹¹ Cf. Section 5.4 of the SAMS Guidelines «Intensive-care interventions» (Ineffectiveness versus little or no likelihood of benefit).

¹² Cf., for example, Persad G, Wertheimer A, Emanuel E J. Principles for allocation of scarce medical interventions. Lancet 2009; 373: 423–31.

4. Triage decisions

4.1. Phases

- **On admission:** extent and duration of treatment, determination of pathway (e.g. ICU treatment, intermediate care, palliative care).
- **After 2–3 days:** continuation of treatment, limitation of treatment intensity or duration, modification of treatment goal and palliative care.

4.2. More stringent criteria

If ICU and external bed capacity is no longer sufficient to allow all patients requiring intensive care to be treated, the first measure is to **make the short-term prognosis criterion more stringent**. The aim is then to maximise benefits for the individual patient and for patients collectively – i.e. to make decisions in such a way as to save the largest possible number of lives. The good short-term prognosis criterion thus becomes (even) more central.

In a mass influx situation, only patients who require mechanical ventilation (or another specific intensive-care intervention, such as hemodynamic support with vasoactive agents or continuous renal replacement therapy) are to be admitted to the ICU, in accordance with the criteria defined below.

In this situation, resuscitation following cardiac arrest is not recommended.

Depending on the development of pressure on care facility capacity and the scale of the patient influx, two stages can be distinguished in relation to the criteria for triage decisions:

Stage A: ICU beds available, but capacity limited

→ Admission triage

Stage B: No ICU beds available

→ Resource management through decisions on discontinuation of treatment

At Stage B, cardiopulmonary resuscitation is not to be undertaken in patients admitted with cardiac arrest.

4.3. Initial triage: criteria for ICU admission¹³

Step 1:

Does the patient have any of the following inclusion criteria?

- Requirement for invasive ventilatory support?
- Requirement for hemodynamic support with vasoactive agents (noradrenaline-equivalent dose >0.1 µg/kg/min)?

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. Box above)

- Patient's wishes (advance directive, etc.)
- Unwitnessed cardiac arrest, recurrent cardiac arrest, cardiac arrest with no return of spontaneous circulation
- Metastatic malignant disease
- End-stage neurodegenerative disease
- Severe and irreversible neurological event or condition
- Chronic condition:
 - NYHA class IV heart failure
 - GOLD group D COPD
 - Cirrhosis, Child-Pugh score >8
 - Severe dementia
- Severe circulatory failure, treatment-resistant despite increased vasoactive dose (hypotension and/or persistent inadequate organ perfusion)
- Estimated survival <12 months

Stage B (cf. Box above)

Here, the following additional criteria are applied:

- Severe trauma
- Severe burns (>40% of total body surface area affected) with inhalation injury
- Severe cerebral deficits after stroke
- Chronic condition:
 - NYHA class III or IV heart failure
 - GOLD group D COPD or FEV₁ <25% or secondary pulmonary hypertension or home oxygen therapy
 - Cirrhosis with refractory ascites or encephalopathy > stage I
 - Stage V chronic kidney disease
- Moderate dementia (confirmed)
- Age¹⁴ >85 years
- Age >75 years and at least one criterion:
 - Cirrhosis
 - Stage III chronic kidney disease KDIGO
 - NYHA class >I heart failure
- Estimated survival <24 months

If one of the exclusion criteria is fulfilled, the patient is not to be admitted to the ICU.

¹³ Cf. Christian MD, Hawryluck L, Wax RS, et al. Development of a triage protocol for critical care during an influenza pandemic. CMAJ 2006; 175: 1377–1381.

¹⁴ According to available data, age is a prognostic indicator, cf. Zhou F. et. al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet 2020 Mar 11. pii: S0140-6736(20)30566-3. doi: 10.1016/S0140-6736(20)30566-3.

4.4. Triage during ICU stay

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

Patients in the ICU must be assessed regularly (at least every 48 hours) and interprofessionally. If there is no improvement, or a deterioration, in health status, it must be decided whether treatment is to be continued or the treatment goal should be changed and the patient should receive palliative care. This also applies to all other (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 ICU discharge:

- Patient extubated or with spontaneous breathing (or partial ventilatory support) through tracheotomy → Patient discharged from ICU

Step 2:

Presence of both of the following criteria:

- Stabilisation or improvement of oxygenation and ventilation
- Stabilisation or improvement of hemodynamics

Both of these criteria must be met for ICU treatment to be continued.

Step 3:

Presence of one of the following criteria for little or no likelihood of benefit with ICU treatment:

Stage A (cf. Box above)

- Occurrence of cardiac arrest during ICU stay, unless resuscitation with defibrillation is successful;
- Occurrence of a new significant organ failure not present on admission.

Stage B (cf. Box above)

- No improvement in respiratory or hemodynamic status
- Occurrence of cardiac arrest during ICU stay
- Failure of two organs in addition to the lungs
- Advanced multiple organ failure, e.g. significant increase in SOFA score (>2 points) within 24 hours

The presence of one criterion means that continuation of ICU treatment is no longer indicated and the patient will receive palliative care.

5. Decision-making processes

In triage decisions, confidence must be maintained under the most difficult conditions. For this reason, fair rationing 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. Ultimately, however, responsibility is borne by the most senior person 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 requirements¹⁵ concerning the duty to provide regular reports on ICU bed numbers and occupancy are to be complied with.

III. Appendix

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¹⁵ Cf. COVID-19 Ordinance 2.

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The latest literature on SARS-CoV-2 is made available on the website of the **Swiss Intensive Care Medicine Society (SGI-SSMI)** at

www.sgi-ssmi.ch

2. Information on the preparation of these guidelines

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Approval

The guidelines have been approved by the Central Ethics Committee (CEC), the Executive Board of the SAMS and the Board of the Swiss Intensive Care Medicine Society (SGI-SSMI); they are effective from 20 March 2020.