

**Guide to Adult Critical Care
and Triage
SARS-CoV-2 (COVID-19)**

**Vitalité Health Network
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Preamble

This document is addressed to regional hospitals in Vitalité Health Network liable to treat critical care patients who are suffering from, or suspected carriers of, a COVID-19 infection. The document is inspired by the technical procedure guide prepared for the Québec Ministry of Health and Social Services. It's a generic document that is not a substitute for the practices adapted by critical care and infection prevention and control (IPC) teams in each individual centre. The pandemic situation is changing every day, so these guidelines will probably have to be adapted as we go. Please keep abreast of updated information.

Definition of a Suspected Case

The definition of a suspected case for an ICU will be the same as that given by New Brunswick Public Health. For now, all cases of severe respiratory infections testing negative for COVID-19 and without etiology will remain in COVID-19 isolation and be retested in 48 h. If the second test is negative, patients shall be treated in droplet contact isolation until identification of the etiology, with aerosol procedural protection for procedures that generate aerosols (MRS-CV poster).

IMPORTANT

The procedures described in this document shall be carried out directly by the intensivist, or failing that, by the person the most familiar with these procedures, until further notice. *In the absence or unavailability of an intensivist or a physician, they shall be carried out by the most senior resident available.*

**At all times, the safety of hospital staff is
the priority.**

1. Initial Preparation (at all times)

A negative-pressure room is kept free at all times and ready to receive a critically ill patient suspected or proven to be infected with SARS-CoV-2 (COVID-19) for all procedures with a high risk of aerosolization (intubation, bronchoscopy, stabilization).

- If the negative-pressure room is occupied or unavailable, an alternative should be free and available (alternative room).
- If no negative-pressure room is available, strict airborne isolation is required for any high risk invasive procedure, as described above.
- Staff shall check daily that negative-pressure or designated rooms are ready, including:
 - Negative-pressure system functional with the door closed.
 - Wireless communication system available and functional (example: baby monitor).
 - Alcohol-based solution available inside the room, in the antechamber and at the exit.
- Personal protective equipment (all sizes) is always available quickly near the designated room.
- Dedicated staff shall always be identified to look after the first case on every shift (one member of the nursing staff, RT, attendant if necessary).
- An updated copy of this document shall be distributed to:
 - ICU physicians
 - Nurse manager and nurse clinician
 - Members of the nursing staff
 - RTs

2. Personal Protective Equipment

Refer to section [5a of the Network's Pandemic Plan](#) (French only).

3. Patient Admission Procedure

A. Criteria for admission to ICU

The proposed criteria for admission to the ICU generally include:

- Significant respiratory distress
- Persistent hemodynamic instability despite adequate volemic resuscitation
- Altered state of consciousness
- Any intubated patient

B. Preparation

- The physician responsible for the critically ill patient who is suspected or proven to be infected with SARS-CoV-2 (COVID-19) shall call the intensivist on call to request admission to the ICU.
- Initial transfer to a regional hospital (Edmundston, Campbellton, Bathurst and Dumont UHC) should be considered for proven cases if the patient's clinical condition requires.

C. Patient admission to ICU

- The physician responsible for the ICU shall authorize admission of the patient and pass on the necessary pertinent information, in particular the equipment needed and the individual medication required when receiving the patient. The physician responsible for the ICU is responsible for the decision to admit the patient to the ICU or to transfer the patient to another centre or to the floor.
- The patient is transferred from the ER by the dedicated staff (ER team vs ICU team, depending on the centre), with personal protective equipment, including a nurse, RT, attendant if necessary.
- Non-essential staff shall not be present in order to avoid any unnecessary exposure. Transport shall be facilitated to avoid as much as possible any contact with the rest of the hospital community.

4. Transport Procedure

- Since it constitutes a risk for transmission, patient transport should be reduced to a minimum.
- In consequence, the decision to call for examinations must be taken after due reflection:
 - Is it highly probable that the examination will answer a clinical question that will change treatment? Before starting, consider all the imaging that may potentially be needed to treat the patient.
 - Daily lung x-rays are not recommended. Instead, they should be taken at admission and then as needed based on the patient's clinical condition.
- A transport procedure for COVID-19 patients shall be put in place in each centre to reduce exposure to the staff and the hospital community.
- Determine the staff needed to accompany the patient from the unit: Nurse, RT, attendant if needed (all with PPE).

5. Airway Management Procedure - Suspected Severe COVID-19 Cases

Refer to the [Regional Guide for Protected Airway Management](#) and the [Regional Guide for Patients with BPAP / CPAP and Tracheostomy](#).

6. Ventilatory Support and Bronchoscopy Procedure

- Apply the highest standards of protective ventilation for SARS (e.g. “ARDSNet”).
- Back-up therapies:
 - Ventilation in a ventral position may be used and shall be applied following the guidelines
 - Cases of severe refractory hypoxemia have to be discussed quickly with centres having expertise in severe SARS.
- **A closed-circuit suction system shall be used.**
- **Avoid as much as possible disconnecting the respirator.**
 - If the respirator has to be disconnected, first clamp the endotracheal tube and put the respirator on standby.
- If possible, all staff shall leave the room for the designated period for air exchanges to occur depending on the room – enough time for the aerosol load to decrease.
- Accidental extubation requiring reintubation shall be treated as a situation at high risk for aerosols where the safety of staff and the premises is the priority.
- **Bronchoscopies generate a lot of aerosols and must be avoided as much as possible:**
 - **The decision to do a bronchoscopy must be made taking into account the anticipated benefits for the patient (alternative diagnosis that cannot be obtained any other way).**
 - It must be done in a negative-pressure environment.
 - Curarization is encouraged for the procedure.

7. Sterile Procedure and Techniques (central line, arterial cannula, thoracic drain)

- The procedures are carried out by the intensivist or the most experienced person available.
- Ideally, dressing in sterile PPE outside the room and movement toward the procedure room involve two persons, one who is not sterile and facilitates maintaining asepsis for the main operator.
- The nursing staff assists the physician.
- Prepare and review all material in advance to reduce entrances and exits.
- Minimize material in the room.
- The use of an ultrasound is encouraged.
- Ultrasound machines shall be cleaned following the manufacturer’s recommendations and the policy and procedure after each procedure.

8. Managing Cardiac Arrest

Refer to the [COVID-19 Unit Cardiopulmonary Arrest Management Guide](#).

9. Extubation

When extubation criteria have been met:

*Do not use a T tube for ventilation weaning.

For any ventilated patient who is not a suspected/confirmed COVID-19 patient. Extubate according to normal standards.

For any ventilated patient who is a suspected COVID-19 or Covid-19 (+) patient (and/or in COVID-19 isolation – droplets/contact, MRS-CV poster): The professional should follow the extubation protocol for COVID patients.

Plan and Preparation:

1. Ensure the patient meets the extubation criteria.
2. Avoid performing extubation with non-invasive ventilation or with a high flow O₂ nasal cannula.
3. Ensure a physician is available on the unit in case re-intubation is needed.

Matériel to be prepared in the negative pressure room where the extubation will take place:

1. Disposable blue pad
 2. Scissors PRN
 3. Yankauer suction
 4. Standard O₂ mask
 5. 10mL syringe
- Transfer the ventilated patient into the negative pressure room.
 - Extubate in a negative pressure room with an N95 mask, gloves, a disposable level 3 gown and visor.
 1. Ideally only have two people present during the extubation.
 2. Pre-oxygenate the patient with 100% FiO₂.
 3. Put the patient in a minimum 30° position.
 4. Do gentle oral aspiration.
 5. Do ONE closed aspiration with the cuff INFLATED.
 6. Do a leak test corner depending on the physician** based on the risk of post-extubation stridor.
 7. Remove the endotracheal tube attachments (Anchor fast) and hold the tube in place.
 8. Shut off the ventilator.
 9. Disconnect the tubing from the ventilator / ambu bag.

10. Deflate the endotracheal tube cuff with the 10mL syringe.
11. Remove the endotracheal tube WITHOUT additional suction and DO NOT ask the patient to cough voluntarily when the endotracheal tube is removed.
12. Immediately put an O₂ mask on (to minimize droplet dispersion if the patient coughs) and open the O₂ flow as needed.
13. Discard the endotracheal tube and blue pad.
14. Put a surgical mask over the O₂ mask when the patient is ready to be transferred back to their room (ideally, wait for the period designated for air exchange according to the negative pressure chamber for the aerosolized particles to be deposited).

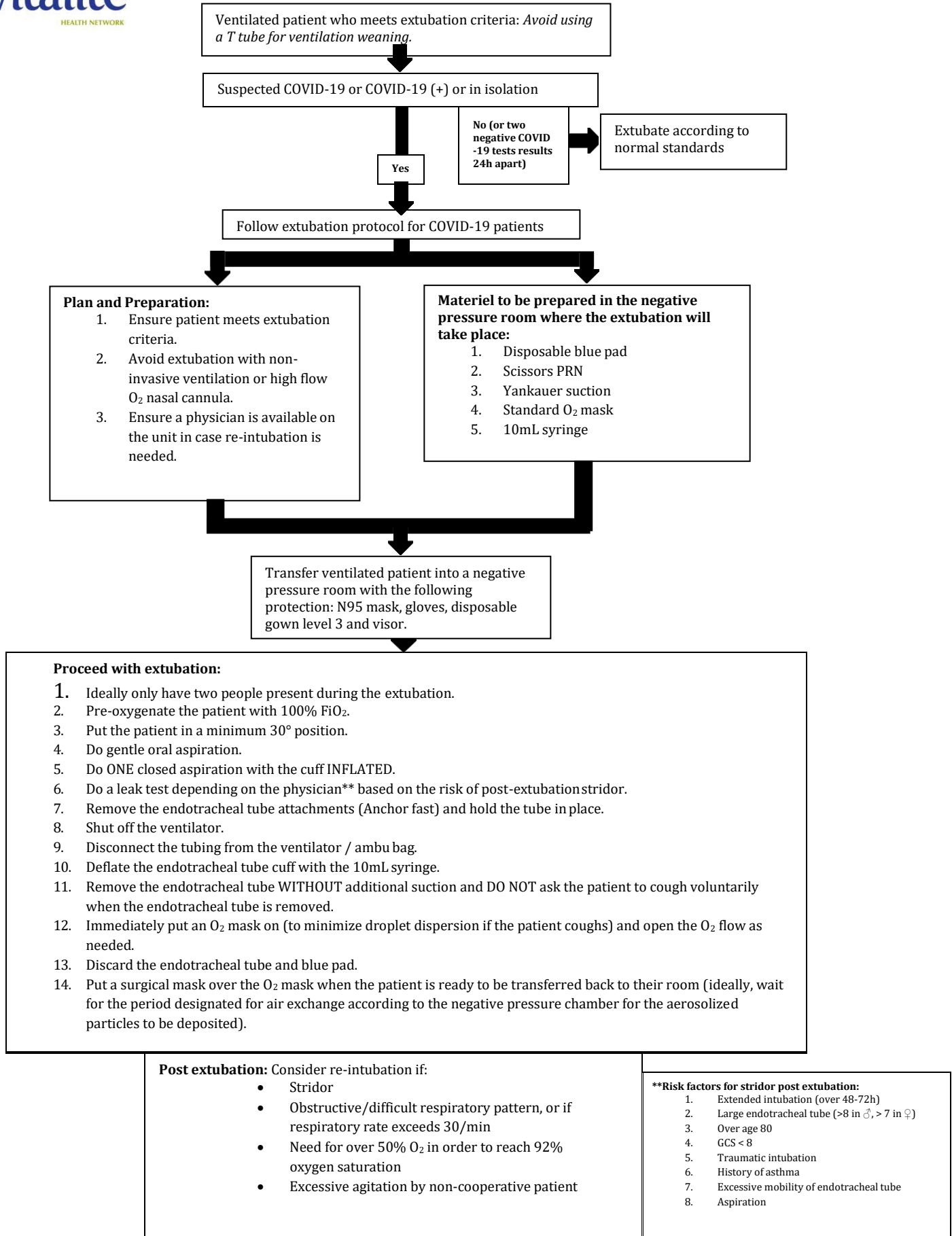
Post-extubation:

Consider reintubation of:

- Stridor;
- Obstructive/difficult respiratory pattern, or if respiratory rate exceeds 30/minute;
- Need for over 50 percent O₂ in order to reach 92% oxygen saturation;
- Excessive agitation by non-cooperative patient.

****Facteurs de risque de stridor post extubation :**

1. Intubation prolongée (plus de 48-72h)
2. Gros tube endotrachéal (>8 chez homme, > 7 femme)
3. Plus de 80 ans
4. GSC < 8
5. Intubation traumatique
6. Histoire d'asthme
7. Mobilité du tube endotrachéal excessive
8. Aspiration



10. Samples and Labs

- Limit samples to those that are urgent and will change treatment.
- Handle samples according to the institutional procedures in effect.

11. Pharmacotherapy

In the current state of knowledge, treatment for COVID-19 is supportive. There is no literature supporting a standardized pharmacological approach. Please refer to the [Spectrum](#) application found on the Vitalité Health Network website.

12. Ethics

- Please consult the ethics policy and guideline section 1G; taken from the regional pandemic plan - COVID-19 for ethical considerations.
- End of life care should represent a shared decision that takes into account the dignity of the patient, the wishes of the family, risks of contagion and available resources.
- There exists a triage document that may be used according to available resources.

TRIAGE IN CRITICAL CARE

During a pandemic, it is very possible that the demand for critical care and ventilators will be increased. The predictive hypotheses used to model the demand for ventilators and critical care are as follows:

- The average proportion of patients admitted who have COVID-19 will be 10%.
- The average proportion of patients admitted who have COVID-19 and require ventilators will be 5%.
- The average length of a stay in the ICU for a COVID-19-related illness will be 10-14 days.

A fair system of access to critical care must be applied to all hospitalized patients and not just those with COVID-19. When it is activated, this triage shall apply to the whole province of New Brunswick. Activation will be ordered by the provincial EOC (emergency operations centre). Pediatric patients will continue to be transferred to the IWK when possible.

Decision-making process for triage for critical care

The critical care working group recommends the following process to apply the triage protocol for critical care:

- The Emergency Operations Centre shall coordinate the activation or deactivation of the triage protocol for critical care in the whole province simultaneously. This centralized coordination will provide fair access to critical care in the entire province, to the extent available, until resources are at full capacity and the triage protocol for critical care is activated. In the same way, deactivating the protocol will also require province-wide coordination. A centralized decision-making process will be based on declarations by the former RHAs about the availability of resources for critical care.
- After activation, a patient's attending physician shall apply the triage protocol for critical care.
- When faced with difficulties in applying the protocol for critical care, the attending physician may consult with colleagues in the working zone or elsewhere in Vitalité Health Network via the usual means of communication. There won't be a team on call to provide support with this for all of Authority A. Each zone must predetermine a group of at least three persons to help the attending physician with what are often difficult decisions and monitor cases in the ICU daily.
- The physician on call will be responsible for indicating on the patient's chart the appropriate information about any consultation with a colleague. It is recommended that all other persons involved in the patient's case maintain their own documents related to their participation, to proposed decisions and to advice given.

Clinical assessment – Triage protocol for critical care

The triage protocol for critical care is described below, accompanied by a flowchart of the process. A tool for noting patients' results is also available (see [Tool 6.1](#)).

1st Step – Assess the patient to determine criteria for inclusion.

To meet these criteria, the patient must present with a criterion A or a criterion B.

A) Requirements related to invasive ventilatory assistance:

- Significant hypoxemia $SPO_2 < 90\%$ with high oxygen flow cannula or mask without rebreathing / $FIO_2 > 0.85$.
- Respiratory acidosis with a $pH < 7.2$.
- Clinical signs of imminent respiratory failure. Inability to protect open airway.
- Altered state of consciousness.

B) Hypotension:

- Hypotension ($ABP < 65$ or $BPs < 90$) with clinical signs of shock (altered state of consciousness, decreased elimination of urine or other terminal organ failure) refractory to reestablishment of fluid volume, requiring vasopressor/inotrope treatment that cannot be dealt with on the unit.

If the patient meets the criteria for inclusion, go to the second step.

Otherwise, reassess the patient later in case their clinical state has deteriorated.

2nd step – Assess the patient to determine criteria for exclusion.

First and foremost, validate whether there exist any limitations related to the patient's level of care (cardiac resuscitation, intubation and admission to the ICU). Then, if a criterion for exclusion is found, do not admit the patient to critical care. Continue the current level of care, or commence palliative care based on the indications. A patient's admissibility to critical care may be reassessed as resources become available and the protocol for critical care is deactivated.

The criteria for exclusion include the following in particular:

- Cardiac arrest: unwitnessed, recurrent (except torsade de pointes and hypothermia), refractory to usual measures; related to trauma.
- Metastatic malignancy with vital prognosis < 1 year, unless the patient has recently started immunotherapy treatment and is suffering from immune complications of this treatment.
- Hematological neoplasia with probability of mortality $\geq 80\%$ in 1 year.
- Serious burn – when two of the following three criteria are reached, mortality in the ICU is over 80%: age ≥ 60 , TBSA $\geq 40\%$, severe inhalation injuries.
- Severe trauma (using the revised trauma score (RTS) or TRISS with predicted mortality above 80%).
- Moderate to severe dementia (unable to name known family and friends even when well, or requiring quasi-total assistance with ADL/DA, or institutionalized patient).
- Frail patient ≥ 70 who it is suspected will not survive admission to the ICU (Clinical Frailty Scale ≥ 7).
- Advanced or untreatable neuromuscular disease (e.g.: ventilator-dependant ALS).

- Serious and irreversible neurological event or condition (e.g.: serious CVA in brain stem, neurovegetative state) unless organ donation foreseeable.
- Any chronic disease with vital prognosis < 1 year.
- Patient aged 80 or over.
- Organ failure that meets the following criteria:
 - Cardiac:
 - Cardiogenic shock in patients ≥ 75.
 - NYHA functional class ≥3/4 present for 6 months in patients ≥ 75 ans.
 - Pulmonary:
 - COPD with FEV < 25% or O2 dependant
 - Cystic fibrosis with FEV <30%.
 - Idiopathic pulmonary fibrosis with FVC < 50% or O2 dependant or diffusion < 30%
 - Pulmonary arterial hypertension (group 1) requiring IV prostaglandins or with NYHA functional class 4/4.
 - Liver:
 - Cirrhosis with MELD score ≥25 in a patient who is not a candidate for a liver transplant.
 - Kidney:
 - Dialysis patient ≥ 75.

If a patient does not present with any of the criteria for exclusion, go to the third step.

N.B.: These criteria for exclusion may change during the pandemic based on the availability of information about the disease.

3rd step – Assess SOFA score (sequential organ failure)

Before a patient is admitted to the ICU, their SOFA score has to be assessed (see Table 6.1) and taken into account just as much as the criteria for inclusion and exclusion.

Table 6.1: Sequential Organ Failure Assessment Score (SOFA)

(Adapted from: F.I. Ferreira, D.P. Bota, A. Bross, C. Melot, J.L. Vincent (2001). “Serial evaluation of the SOFA score to predict outcome in critically ill patients”, *JAMA*, vol. 286, p. 1754-1758.)

Variable	0	1	2	3	4
PaO ₂ /FiO ₂ , mmHg	> 400	≤ 400	≤ 300	≤ 200	≤ 100
Platelets, x 10 ⁹ /L	> 0.150	≤ 0.150	≤ 0.100	≤ 0.050	≤ 0.020
Bilirubin, µmol/L	<20	20-32	33-100	101-203	> 203
Hypotension	None	Average blood pressure (ABP) < 70 mmHg	Dop ≤ 5	Dop > 5 or Epi ≤ 0.1 or Norepi ≤ 0.1	Dop > 15 or Epi > 0.1 or Norepi > 0.1
Glasgow Coma Scale	15	13-14	10-12	6-9	<6
Creatinine, µmol/L	<106	106-168	169-300	301-433	>434

Notes for Table 6.1:

The doses of dopamine (Dop), epinephrine (Epi) and norepinephrine (Norepi) are expressed in µg/kg/min

Explanation of variables:

PaO₂/FiO₂ indicates the amount of oxygen in the patient’s blood. Platelets play an essential role in blood clotting.

Bilirubin is measured with a blood test and indicates liver function.

Hypotension indicates low blood pressure; scores of 2, 3 or 4 indicate that blood pressure has to be maintained with powerful medication, in particular dopamine, epinephrine and norepinephrine, requiring monitoring in the ICU.

The Glasgow Coma Scale is a standardized scale of neurological functioning; a low score indicates poor functioning.

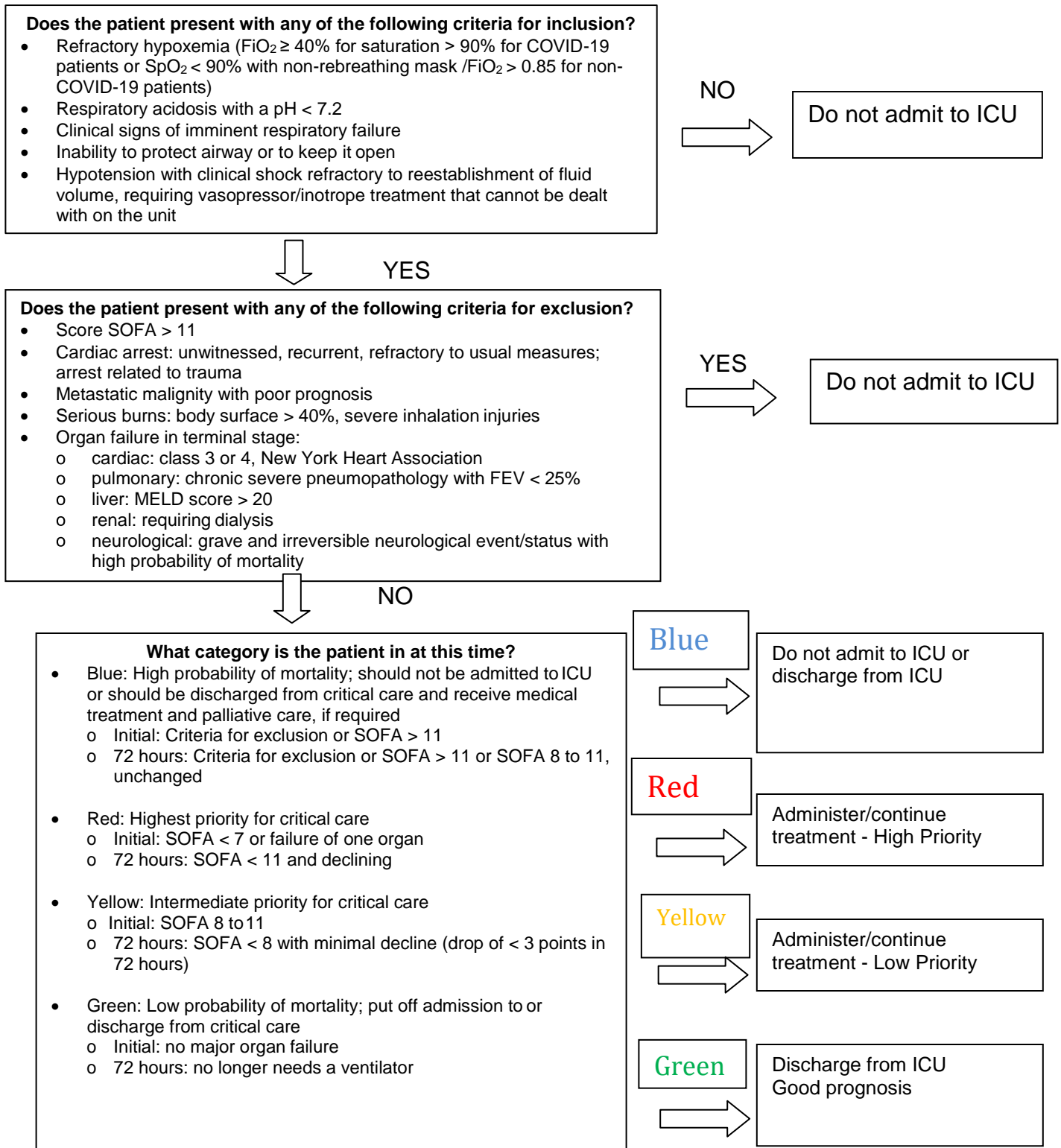
Creatinine is measured with a blood test and indicates kidney function.

Then the patient is assigned to a category of treatment based on these results. The patient is assessed 72 hours after admission to the ICU, then reassigned based on readjustment of the SOFA requirements for each category.

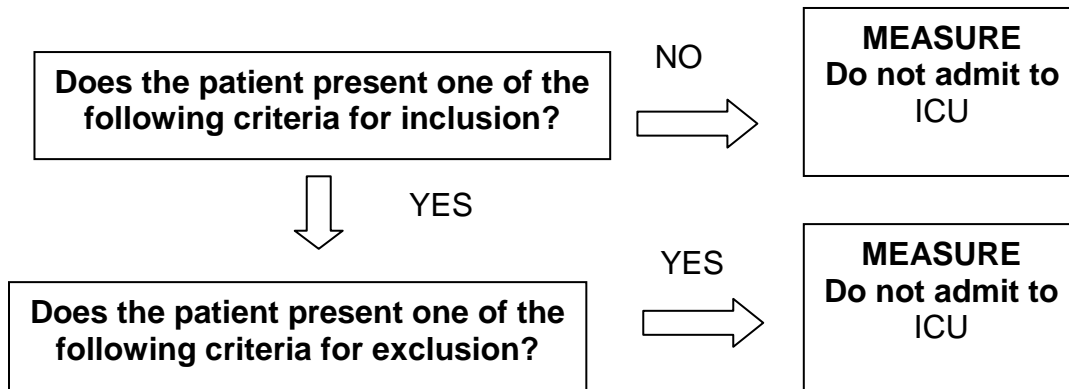
- **Blue:** High probability of mortality; should not be admitted to ICU or should be discharged from critical care and receive medical treatment and palliative care, if required.
 - Initial: Criteria for exclusion or SOFA > 11.
 - 72 hours: Criteria for exclusion or SOFA > 11 or SOFA 8 to 11, unchanged.
- **Red:** Highest priority for critical care.
 - Initial: SOFA < 7 or failure of one organ.
 - 72 hours: SOFA < 11 and declining.
- **Yellow:** Intermediate priority for critical care.
 - Initial: SOFA 8 to 11.
 - 72 hours: SOFA < 8 with minimal decline (drop of < 3 points in 72 hours).
- **Green:** Low probability of mortality; put off admission to or discharge from critical care.
 - Initial: no major organ failure.
 - 72 hours: no longer needs a ventilator.

Diagram 6.1: CRITICAL CARE TRIAGE PROTOCOL

For all patients requiring treatment in the ICU, whether or not they have COVID-19



Tool 6.1, 2nd PHASE: Critical Care Triage Tool



What category is the patient in at this time?

	Initial	72 hours	Priority	MEASURE
BLUE	Criteria for exclusion or SOFA > 11	Criteria for exclusion or SOFA > 11 or SOFA < 8, unchanged	High probability of mortality; should not be admitted to ICU or should be discharged from critical care and receive medical treatment and palliative care, if required.	Do not admit to ICU or discharge from ICU
RED	SOFA < 7 or failure of one organ	SOFA < 11 and declining progressively	Highest priority for critical care	Administer/continue treatment HIGH PRIORITY
YELLOW	SOFA 8 to 11	SOFA < 8 with minimal decline (drop of < 3 points in 72 hours)	Intermediate priority for critical care	Administer/continue treatment LOW PRIORITY
GREEN	No major organ failure	No longer needs a ventilator	Low probability of mortality; put off admission to or discharge from critical care	Discharge from ICU GOOD PROGNOSIS