

## **Supplemental Material**

### **In-hospital outcomes and short-term post-discharge status of COVID-19 ECMO-supported patients**

Filomena R. B. G. Galas, MD, PhD; Henrique M. Fernandes RN; André Franci MD;  
André L. Rosário MD, PhD; Roberta Saretta MD; Laerte Pastore Jr., MD, PhD;  
Luciano M. Baracioli, MD, PhD; Juliana G. Moraes, MD, PhD; Matheus M. Mourão  
MD; Livia V. Costa, RN; Teresa C. D. C. Nascimento, RN; Luciano F. Drager, MD,  
PhD; Márcia R. S. Dias MD; Roberto Kalil-Filho, MD, PhD.

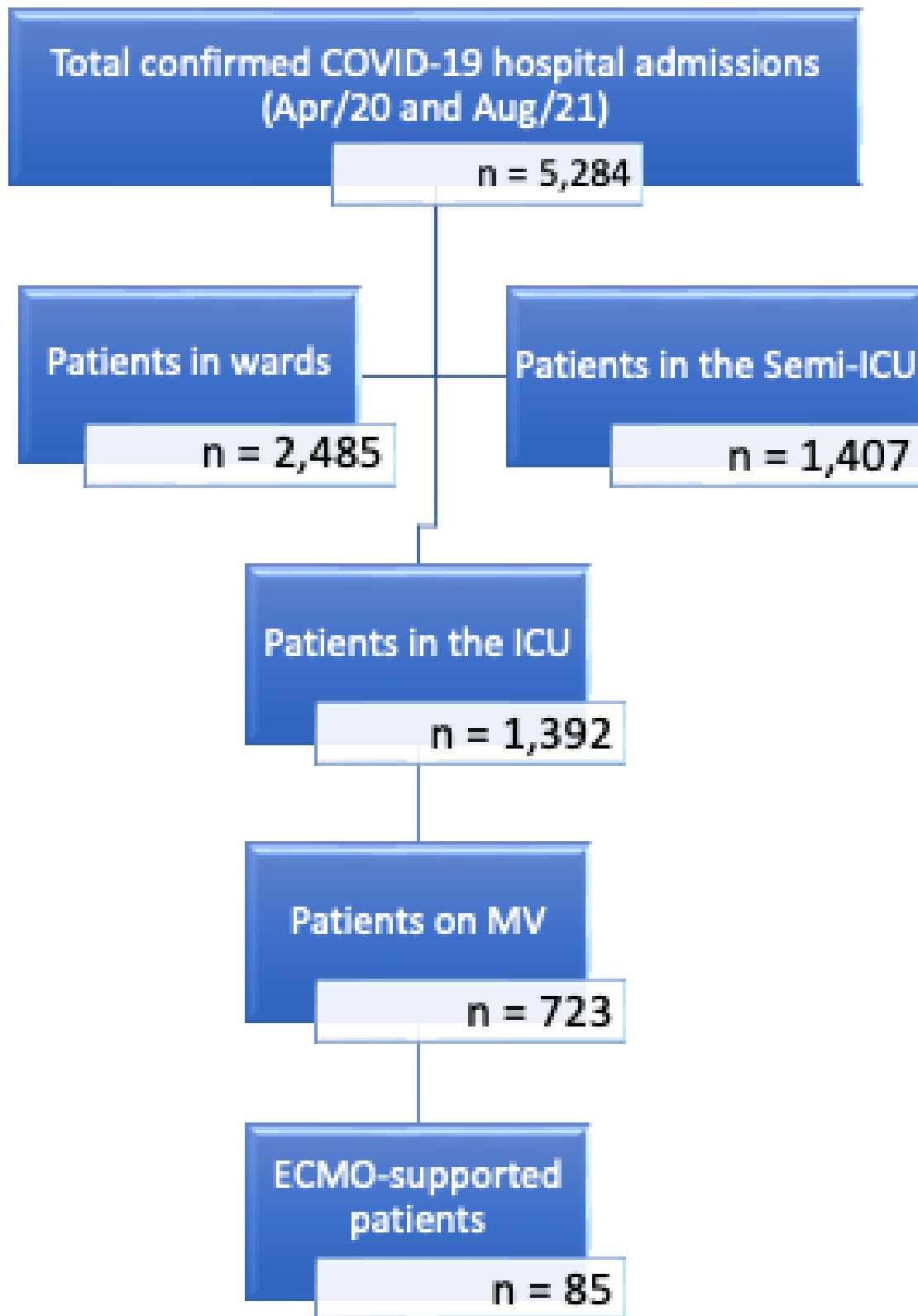


Figure 1s. Flowchart comprising the overall number of confirmed COVID-19 patients admitted to the hospital during the study period. ICU: intensive care unit; MV: mechanical ventilation; ECMO: extracorporeal membrane oxygenation.

## **Description of anticoagulation regimens, total mechanical ventilation duration and ECMO-related complications**

### **Anticoagulation regimens:**

- Therapeutic: enoxaparin 1mg/kg subcutaneous BID or unfractionated heparin (UFH) in continuous IV infusion controlled by aPTT
- Prophylactic: enoxaparin 40 mg subcutaneous QD or UFH 5,000 international units TID
- Intermediate-dose: enoxaparin 40 mg subcutaneous BID

**Total mechanical ventilation (MV) duration:** time considered since the orotracheal intubation day until the last day of MV support. Patients were considered free from MV when they were spontaneously breathing without any mechanical ventilatory support. For patients who were weaned from MV without the need for tracheostomy, the last day on MV was considered the day orotracheal cannula was removed. If patients were reintubated, every day on MV was counted cumulatively until complete independency of invasive artificial respiratory support. For patients who needed tracheostomy, the last day on MV was considered when patients were completely weaned from any respiratory device (portable or not) which generates positive intrapulmonary pressure.

### **ECMO-related complications:**

- Thrombosis: any deep venous thrombosis found on venous doppler ultrasound of lower (for femoral cannulations) or superior extremities (for jugular cannulations).
- Hemolysis: since we do not perform the test for plasmatic cell free hemoglobin, hemolysis was defined as a 2-fold increase in plasma activity of lactate dehydrogenase (LDH) compared to pre-ECMO values.
- Major bleeding: considered any bleeding that led to the need for red blood cell transfusion
- Gas embolism: considered any report on the presence of air bubbles in the ECMO-circuit registered in the patient's medical record by the ICU teams.
- Limb ischemia: considered any worsening in limb perfusion (capillary filling time, cyanosis or asymmetric lower temperatures) in comparison to pre-ECMO parameters that was registered by the ICU teams in the patients' medical record.

- Membrane substitution: considered any need for membrane substitution related to patients' persistent hypoxemia associated with ECMO-membrane gas exchange inefficiency.

## **Description of the standardized questionnaires applied by the Clinical Outcomes Team after hospital discharge.**

**European Quality of Life Five Dimension (EQ-5D).** This tool encompasses five health domains (mobility, personal care, usual activities, pain/discomfort and anxiety/depression), with three response levels (none, some/moderate and severe/extreme) and an EQ visual analogue scale (VAS), the latter recording self-assessment of the patient's health on a vertical, visual analog scale. The EQ-5D score ranges from 0 to 1, with 1 representing the best QoL. The EQ VAS ranges from 0 to 100, with 100 being “the best imaginable health state” and 0 “the worst imaginable health state”.<sup>10</sup>

**Post-traumatic stress disorder symptoms.** Post-traumatic stress disorder related to the COVID-19 hospitalization was evaluated by using the following questions: Do you present repetitive and disturbing thoughts, memories, or image regarding the experience of illness/recent hospitalization? Do you experience physical symptoms (e.g., heart beating fast, sweating, difficulty breathing) when you remember the experience of hospitalization/illness?

**Anxiety (Generalized Anxiety Disorder 2-item, GAD-2).** The GAD-2 is a simplified and validated scale used for defining a generalized anxiety disorder.<sup>11</sup> Each patient was invited to answer the following questions: Over the last two weeks, how often have you been bothered by the following problems? 1) Feeling nervous, anxious or on edge; 2) Not being able to stop or control worrying. For each question, one of the following answers was selected: Not at all (0 points); several days (1 point); more than half the days (2 points); nearly every day (3 points). With a cut-off of 3 points (or more) the GAD-2 has a sensitivity of 86% and specificity of 83% for diagnosing generalized anxiety disorder.<sup>11</sup>

**Depression (Patient Health Questionnaire-2, PHQ-2).** The PHQ-2 is a simplified and validated scale which inquiries about the frequency of depressed mood and anhedonia over the past two weeks. Each patient was invited to answer the following questions: Over the last two weeks, how often have you been bothered by the following problems? 1) Little interest or pleasure in doing things; 2) Feeling down, depressed or hopeless.

For each question, one of the following answers was selected: Not at all (0 points); several days (1 point); more than half the days (2 points); nearly every day (3 points). The score ranges from 0 to 6. If the score is three or greater, major depressive disorder is likely.<sup>12,13</sup>

**Return to work.** Patients were invited to answer the following questions: 1) Were you working previously to hospital admission? 2) Have you returned do work? and 3) If yes, with or without restrictions?

**Table 1s.** Clinical features of patients with and without response to the 30- and 90-days post hospital discharge questionnaire.

<b>Post-discharge</b>	With response at 30 and 90 days n = 15	Without response n = 30	p-value
Patient response at 30 and 90 days			
Age, mean (SD), years	55 ± 9	51 ± 12	0.278
Female sex, no. (%)	2 (13.3)	7 (23.3)	0.695
BMI, mean (SD), kg/m <sup>2</sup>	29.7 ± 5.3	29.6 ± 6.5	0.968
Any chronic condition, no. (%)	14 (93.3)	25 (83.3)	0.647
Hypertension, no. (%)	8 (53.3)	11 (36.7)	0.286
Diabetes, no. (%)	6 (40.0)	3 (10.0)	0.042
Dyslipidemia, no. (%)	6 (40.0)	4 (13.3)	0.062
Coronary artery disease, no. (%)	0 (0)	2 (6.7)	0.545
Obesity, no. (%)	8 (53.3)	11 (36.7)	0.286
History of Cancer, no. (%)	0 (0)	4 (13.3)	0.285
Chronic pulmonary disease, no. (%)	1 (6.7)	0 (0)	0.333
Chronic kidney disease, no. (%)	1 (6.7)	0 (0)	0.333
SAPS-3, mean (SD)	48 ± 9	53 ± 11	0.184
PaO <sub>2</sub> / FiO <sub>2</sub> ratio, median (IQR)	100 (92 - 111)	110 (90 - 130)	0.188
ECMO support duration, median (IQR), days	8 (7 - 14)	11 (9 - 18)	0.060
MV duration before ECMO, median (IQR), days	4 (1 - 11)	7 (1 - 14)	0.754
MV support duration, median (IQR), days	36 (15 - 49)	44 (24 - 60)	0.391
ICU LOS, median (IQR), days	39 (23 - 56)	44 (32 - 61)	0.310
Hospital LOS, median (IQR), days	59 (45 - 77)	70 (53 - 95)	0.480
Dialysis after ECMO, no. (%)	0 (0)	1 (3.3)	1.000

BMI: body mass index; SAPS-3: Simplified Acute Physiology Score III; ECMO: extracorporeal membrane oxygenation; MV: mechanical ventilation; ICU: intensive care unit; LOS: length of stay.