

# COVID-19

## Post-operative recovery units (PORUs) within the context of SARS-CoV-2

Version 1 – 28 March 2020

### Authors:

- Dr Marie Borel, Department of Anaesthesia and Resuscitation, Pitié-Salpêtrière Hospital
- Dr Arthur James, Department of Anaesthesia and Resuscitation, Pitié-Salpêtrière Hospital
- Ms Anne Clémence Jéhanno, Department of Anaesthesia and Resuscitation, Pitié-Salpêtrière Hospital

### Validation:

- Prof Jacques Duranteau, Department of Anaesthesia and Resuscitation, Bichat-Claude-Bernard Hospital
- Prof Philippe Montravers, Department of Anaesthesia and Resuscitation, Bichat-Claude-Bernard Hospital
- Prof Jérôme Robert, Infection Control Team, Pitié-Salpêtrière Hospital
- Dr Sandra Fournier, Infection Control Team, AP-HP head office

## I. Introduction

The purpose of this document is to describe the adjustments necessary in post-operative recovery units (PORUs) in light of the current SARS-CoV-2 epidemic. It outlines two objectives: 1) to continue delivering the usual operations of a PORU and 2) to treat COVID patients.

Presented below are some principles that seem to be vital in this regard.

## II. Guiding principles

- A. Ongoing urgent care activities must continue.
- B. One medical and one paramedical representative should be appointed.
- C. This document is not intended to be a local procedure but rather an aid to implementing one.
- D. As regards the organisation of the PORU, COVID+ patients should be kept as distinctly separate as possible from COVID- patients.
- E. Admissions to any critical care areas should be regulated in agreement with intensive care.
- F. It is strongly advised that all hygiene-related issues are approved by a designated member of the department.

## III. Organisation

### 1. General principles

It is proposed that two zones be created: one COVID zone and one non-COVID zone. The capacity of each zone should be adapted, according to the activity of the department. These zones should be as far

apart geographically as possible and have their own equipment. Confirmed or possible COVID cases, such as those defined by the crisis team, will be admitted to the COVID zone, where visiting is prohibited.

Stocks of equipment - particularly those for COVID+ patients - should be secured, especially closed suction systems and syringe driver.

## 2. Ongoing care

Ongoing care-related activities taking place in the department should be protected.

## 3. Critical care

It is possible to carry out critical care activities in the COVID and non-COVID zones of the PORU. However, it is important to consider patient type (e.g. number and type of organ failure and the need for complex life support) and the triage rules, in light of the epidemic.

# IV. Setting up a reception area for COVID patients in the PORU

## 1. Layout

The COVID zone should be as far away physically from the non-COVID zone as possible, by installing temporary or, at best, permanent structures (plywood walls covered in tarpaulin) to separate the non-COVID zone as well as outside.

This zone should contain a physical entrance with an airlock.

If the pressure in this zone is not negative, the zone should, as far as possible, contain windows which should be opened for at least 10 minutes per hour, but this aspect is not imperative.

Beds in the COVID zone should be spaced 1.5 m apart in order to minimise the risk of transmission and staff exposure.

Materials allowing for easy cleaning should be prioritised. The disposal procedure for infectious waste should be identified, along with bedpan washers, preferably those closest to the zone. Bags for disposing of faeces are recommended. In the absence of a bedpan washer, bedpans can be sanitised using wipes containing disinfectant detergent.

## 2. Staff

If COVID patients are arriving regularly, it is suggested that medical and non-medical staff be allocated solely to the COVID zone. If COVID patients are arriving less frequently, patients should each be allocated at least one dedicated paramedical staff member for their stay. This measure is justified given that open spaces increase the risk of transmission. It is suggested to secure each bay using at least one screen.

A doctor and a health executive responsible for the zone should be clearly identified. Ideally, the zone should have a medical administrator and a logistician.

It is proposed that the staff freed up by the drop in scheduled surgical activity (anaesthetists and nurse anaesthetists) could act as a first-line resource to support the increased burden on the PORU's COVID zone. A "reasonably sized" COVID unit consists of around 10 beds, such that the requirements listed above can be coordinated on the usual scale. The transformation into a critical care COVID zone requires a continuous medical presence, with a ratio of one anaesthetist for every five beds.

The ratio of nursing and HCA staff should be adapted according to the type of patients in the COVID zone.

In the case of usual post-operative care, standard PORU ratios apply, with one nurse per four bays. For critical care patients, the number of staff should be increased to 1 to 2 when under increased pressure and then return to the usual ratio of 1 to 2.5.

### 3. Patient procedure

Given that the PORU is intended to be a buffer zone, it should be managed in such a way that all patients admitted to the PORU receive a bid as quickly as possible. Ideally, 10 COVID beds should be available for every bed in critical care.

The route of COVID and non-COVID patients should be anticipated and separated, in order to prevent transmission.

## V. Training

It is advised to draw up procedures specific to the department in the form of a checklist (see the appendix). Various official documents have been published to facilitate the creation of procedures. These procedures should be made available in the COVID and non-COVID zones.

Once created, it is important to:

- Train staff at each point of these procedures, by means of dedicated sessions.
- Put them into practice, including through technical and non-technical training drills (e.g. briefing, updates and debriefing). No high-fidelity equipment is necessary for this.
- Provide a daily debrief, led by the doctor responsible for the zone, in order to foster a sense of sharing a common situation and to pass on information.

## VI. Equipment

### 1. Staff protection

All staff working in the COVID zone of a PORU must wear an FFP2 mask and protective glasses or a protective visor. Staff responsible for intubation or extubation must wear an FFP2 mask, regardless of the patient's COVID status, even in the non-COVID zone. A surgical mask may be worn for four hours and an FFP2 mask for eight hours. In the absence of contact with any infectious droplets, a mask can be worn for several patients, provided it is not touched, removed from the face, damp and is intact, even outside the COVID zone. A staff member, such as a surgical nurse, may be tasked with enforcing rules on hygiene and protection at each hospital site.

All PPE used for contact must be changed between each patient or if dirty. Work uniform is mandatory; civilian clothing is prohibited.

Care should be taken to ensure hand hygiene and gloves worn as a standard precaution.

### 2. Equipment

Each bay should be equipped with a ventilator, an apparatus to monitor multiple parameters including ETCO<sub>2</sub>, a similar number of syringe drivers and a closed system. Each zone (COVID and non-COVID)

must have:

- An intubation kit, containing a video laryngoscope and an Eschmann introducer
- A cart of emergency medicines (according to an inventory that has been devised and validated by the pharmacy)
- The necessary personal and communal hygiene equipment (e.g. sheets, basins, equipment necessary for personal toilet)
- A blood sugar and HemoCue analyser
- An infusion warmer
- A thermometer
- Screens
- An ultrasound machine

### 3. Logistics

The transformation of a PORU involves anticipating orders for specific supplies (e.g. masks and closed circuits) and an increase in certain provisions (e.g. those required for long-term sedation).

Particular attention should be paid to the following materials: surgical and FFP2 masks, protective glasses or visors, protective clothing, closed circuits, filters and medicines necessary for long-term sedation (morphine-based medicines, hypnotics and neuromuscular blocking agents). Thought should also be given to the method of administration of these agents, i.e. syringe driver, infusion pump, etc.

### 4. Disinfection

Surfaces should be disinfected thoroughly, according to the usual procedure (e.g. Surfanios Premium®, 20 ml sachet per 8 l of water, 15 mins contact time, or Surfa'Safe Premium® for equipment with a small surface area, with a contact time of 5 mins).

After discharging a patient, disinfection should be performed after aerating the zone for 15 minutes, without negative room pressure.

All materials entering the COVID zone must be disinfected before leaving the zone. Specimen testing at the bedside is authorised, provided the equipment is disinfected before being used for another patient. All disinfection procedures must be verified by the local hygiene officer.

The usual procedure for infectious waste should be followed for waste produced by the COVID zone, by adapting bins according to the type of waste (not necessarily the usual bins).

## VII. Feedback

Based on recovery unit consisting of 19 spaces:

- Four spaces were allocated to COVID patients. The zone was secured with a partition. An airlock especially for changing in this zone was subsequently incorporated. This zone receives: 1) life-threatening emergencies involving confirmed or possible COVID patients waiting for a space in intensive care; 2) COVID patients admitted to critical care but waiting for a space, and 3) post-operative care patients arriving from the COVID operating theatre.
- Two spaces were re-allocated to non-suspected COVID patients with life-threatening emergencies (ongoing care and intra-hospital transfers).
- Seven critical care spaces were created.
- Six classic post-operative recovery places were secured.

In terms of staff:

- Medical: usual operation with one additional junior doctor and a senior on-call doctor.
- Non-medical:
  - o Target daytime staffing numbers have become the standard staffing numbers (for daytime, night and weekends).
  - o Two nurses and one HCA dedicated to the COVID zone
  - o Six back-up nurse anaesthetists to cope with a rise in activity levels and the transfer of some nurses to intensive care.

This transformation was reliant on a number of major factors:

- Multidisciplinary approach: deployment of the department's entire medical and management team, with the support of hygiene, logistics, pharmacy and administration teams.
- Daily re-assessment: changes in what is expected from one day to the next.
- Dialogue: medical staff would often be the ones to provide solutions best suited to the field. Keeping them updated on a regular, daily basis, even in uncertain situations, was key in this intense situation.

### **VIII. Appendices: example procedures for treating COVID patients**

- Setting up a reception desk
- Dressing and undressing
- Patient screening
- Life-threatening emergencies
- Tracheal intubation and ventilation
- Supporting families
- Withholding care
- Death
- Psychological support for staff, patients and families
- Treating COVID+ staff