

## The first “exclusive COVID-19” endoscopy project



► **Fig. 1** Unit plan for the endoscopy service created at Niguarda Hospital, Milan, Italy, for the treatment of patients with COVID-19. **a** The rooms are colored to show the three different areas: clean area in green, unclean area in red, and the “gray” area (not completely clean, inaccessible to patients). **b** Photographs of the rooms in the plan. **c** Pathways of movement for patients and healthcare workers. The blue arrows show the unidirectional path for healthcare workers; the orange arrows show the path for patients.

The “second wave” of the outbreak of COVID-19 confirmed the need for long-term projects to manage diagnostic and therapeutic endoscopies in patients testing positive for SARS-COV-2 [1]. Referrals and experience are constantly increasing worldwide, and many patients with COVID-19 undergo endoscopies in many centers [2,3]. However, implementing strategies to guarantee a complete division of in-hospital paths for COVID and COVID-free patients remains challenging and a matter for debate.

We would like to present our working “exclusive COVID-19” endoscopy service created at Niguarda Hospital, Milan, Italy. This new endoscopy subcenter was arranged by reorganizing spaces located in the Northern Block of our hospital, and it is completely independent and separate from our regular service, which is located in the Southern Block.

The full planimetry of the service is shown in ► **Fig. 1**.

Two pathways for movement were identified: one for the medical staff (marked in blue in ► **Fig. 1c**) and one for the patients (marked in orange in ► **Fig. 1c**).

Three areas of biohazard risk were created: 1) clean area; 2) unclean area; 3) “gray” area; these three zones are shown in ► **Fig. 1** as different colors (clean = green; unclean = red). The “gray” area is not a completely clean area, but is not accessible to patients, only to healthcare workers; this area is used to clean instruments in the reprocessing room and for the transfer of items to and from the endoscopy room.

The endoscopy room is a negative pressure room (as recommended internationally) to minimize virus diffusion. The nursing room is equipped with direct visual access to the observation room.

The procedure timetable allows 10 endoscopies per day: 5 diagnostic and interventional esophagogastroduodenoscopies (including percutaneous endoscopic gastrostomy, placement of nasojejunal tube, urgent endoscopies); 2 diagnostic and interventional lower gastrointestinal endoscopies; 2 diagnostic

and interventional bronchoscopies; and 1 ear–nose–throat (ENT) procedure (e. g. fibroscopy, tracheostomy control). The service is open from Monday to Friday, and is available for emergencies during the weekend for patients who are SARS-COV-2 positive. Healthcare personnel are part of our endoscopy unit and received preliminary training in the use of personal protective equipment (PPE), which has been further updated according to the specific endoscopic findings and treatments related to COVID-19. The nursing staff are fully trained in digestive, thoracic, and ENT procedures to allow endoscopy nurses to work only in our regular endoscopy unit. This project, which was first described by our group, permits the complete separation of COVID and COVID-free inpatient paths, saves PPE, avoids inpatient contamination, and reduces the exposure to contagion of the entire endoscopy staff as well as outpatients. Furthermore, the facility is shared with other endoscopy services (ENT, thoracic endoscopy) to achieve an endoscopically multidisciplinary approach and to optimize the use of space and healthcare workers. We hope that our experience may be useful to other endoscopy services in their efforts to organize the long-term management of patients with COVID-19.

### Competing interests

The authors declare that they have no conflict of interest.

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