Management of a COVID-19 patient in the endoscopy suite

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Since the COVID-19 pandemic started in December 2019, gastroenterologists have had to rapidly evolve their endoscopy practice to ensure the safety of endoscopy team members and their patients. Because the virus is transmitted via droplets and potentially via airborne inhalation of aerosolized particles, endoscopic procedures performed on patients with confirmed or suspected COVID-19 increase the risk of transmission to healthcare providers.

To minimize the risk of exposure among healthcare workers and patients, protocols and algorithms to reduce inadvertent transmission of the disease is critical. In this article, we review the workflow that was developed by the coordinated efforts of the Department of Anesthesia and the Division of Gastroenterology at Beth Israel Deaconess Medical Center in Boston (Video 1, available online at www.VideoGIE.org). For this workflow, patients with suspected COVID-19 and COVID-19–positive patients are treated as the same and are referred to as COVID-19 patients.

INDICATIONS

Given the risks of transmission of COVID-19 during endoscopic procedures, especially upper endoscopy, one should consider performing only those procedures that are emergent or urgent.[1] Emergent or urgent procedures are typically those that require potentially immediate therapeutic intervention or cases in which the procedure is necessary to make an immediate change in clinical management. If the indication fails to meet 1 of these 2 criteria, if it is safe to do so, one should consider delaying the procedure or using another nonendoscopic technique to aid in diagnosis or treatment.

WORKFLOW DIAGRAMS AND TRAINING

Because the protocols being instituted for safe endoscopy in COVID-19 patients are new, it is critical to develop flow diagrams, cognitive aids, and simulation models (Figs. 1 and 2). Often multiple plan-do-study-act models are needed to develop the optimal process. Training with live simulation models on how the process should run is crucial to ensuring the endoscopy team understands the new protocols and can perform tasks seamlessly.

ON ARRIVAL TO THE ENDOSCOPY UNIT

When arriving at the facility, one should put on a new facemask. In addition, it is advisable to change into a clean pair of scrubs and keep home clothing unexposed to potential COVID-19. All work areas should be carefully disinfected with a product effective against SARS-CoV-2 (https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2). Consider repeated cleaning of the work area on a regular basis throughout the day. Even when wearing a facemask, one should maintain physical distancing in workroom areas and attempt to keep individuals as far apart as possible.

PROCEDURE CONSENT

To reduce the risk and time of exposure of healthcare personnel to patients with COVID-19, consider obtaining all procedure consent verbally. This must be reviewed with one's local legal and compliance officers before being instituted.

PREPROCEDURE CONSIDERATIONS

To reduce the risk of exposure to droplets from COVID-19, a negative-pressure endoscopy room is preferred. If a negative-pressure room is not available, high-efficiency particulate air filters should be used. Ideally, all nonessential equipment should be removed from the room.[1] Any equipment essential to the procedure or nonessential equipment that cannot be moved should be covered in clear plastic drapes to minimize potential contamination of the equipment. Equipment should be stored outside the room and communications (eg, walkie-talkie) should be set up so individuals in the room can contact the "runners" outside the room to prepare any necessary equipment. Once equipment is brought into the endoscopy room, it should be discarded, even if unopened. Alternatively, equipment can be kept in a double bag; then, if the equipment is not used, one can discard the outer bag only.

One should consider intubation for all endoscopic procedures (especially upper endoscopic procedures) to reduce the risk of droplet exposure.

Proper signage should be placed on the endoscopy room door indicating that an aerosol-generating procedure

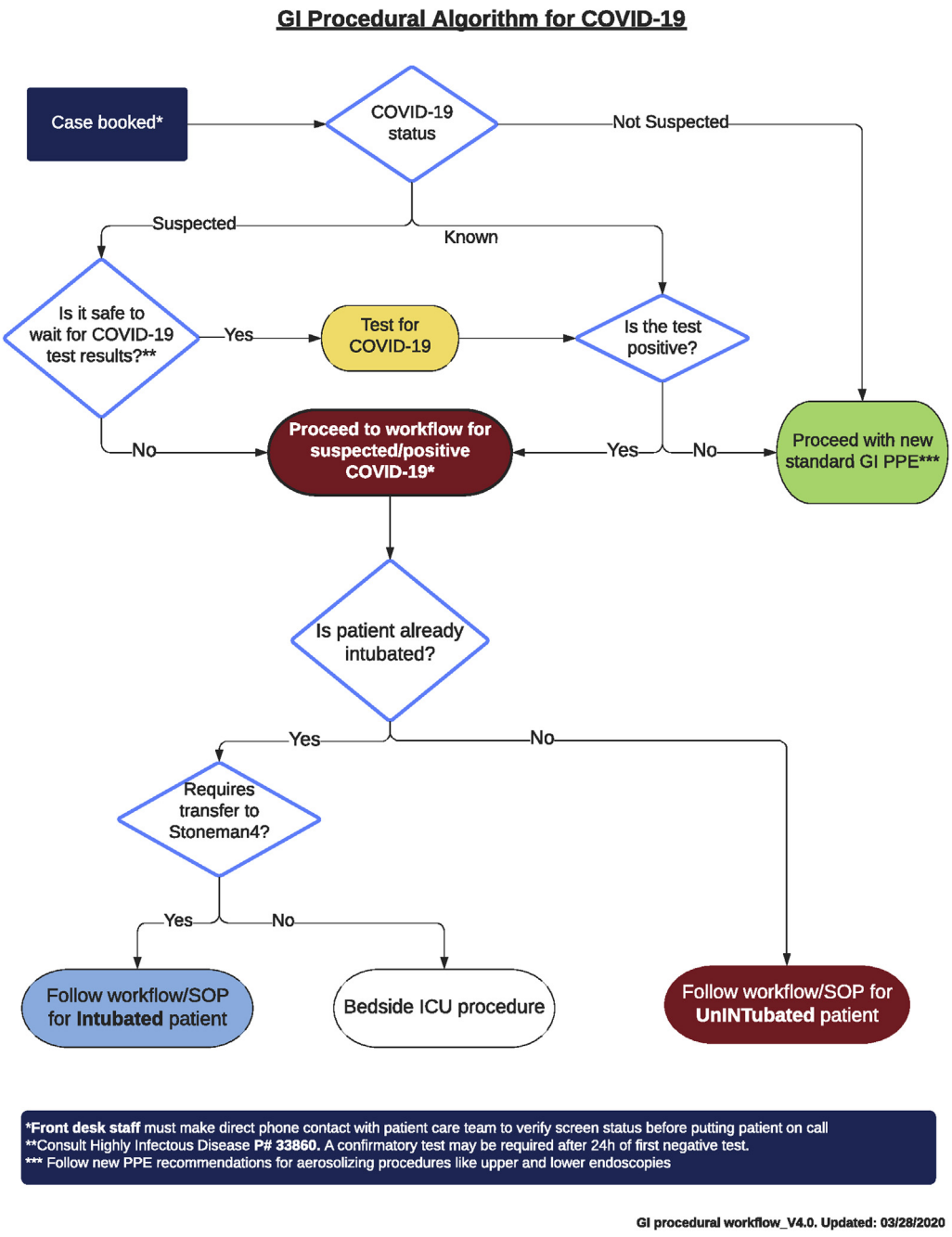

Figure 1. GI procedural algorithm for COVID-19. *PPE*, Personal protective equipment; *ICU*, intensive care unit; *SOP*, standard operating procedures.

is being performed and not to enter the room. Consider marking a large square immediately outside the room as a buffer zone and an area to doff personal protective equipment (PPE).

Before starting the procedure, all team members should huddle to review the planned procedure. The huddle should be done in person with physical distancing or virtually. Team members should identify themselves and their role (eg, endoscopist, anesthesiologist, nurse, technician, runner). A safety officer should be identified; the safety officer will be responsible for ensuring proper donning and doffing of PPE and monitoring the outside door to the endoscopy room to make sure no one enters the room without proper PPE. Discussions during the huddle should include the following: which personnel will be in the room versus outside the room, what procedure is planned and what equipment will be needed in the room or prepared outside the room, patient disposition, and whether any additional resources are needed (eg, environment services). Finally, one should check whether any team members have questions or concerns.

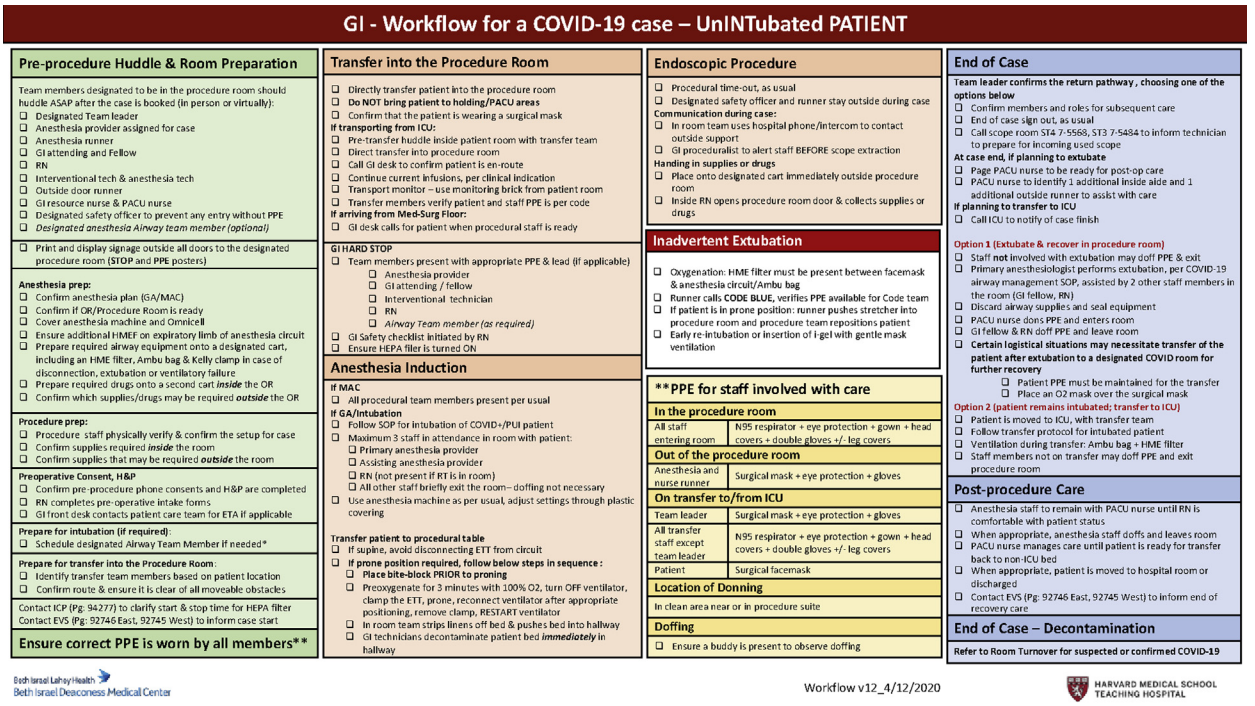

Figure 2. GI workflow for a COVID-19 case—unintubated patient.

DONNING PPE

PPE is only effective if donned properly. The safety officer should monitor the process carefully and stop the donning process if any concerns are noted. The key steps to proper donning are as follows:

1. Remove all nonessential/personal equipment.
2. Perform hand hygiene: wash your hands with soap and water or hospital-approved hand sanitizer.
3. Apply head cover.
4. Apply N95 respirator and ensure adequate seal.
5. Apply eye protection (or a secondary facemask with eye shield over the N95 respirator).
6. Perform hand hygiene.
7. Apply shoe covers (option to apply leg covers, if available).
8. Don and secure impermeable gown.
9. Don 2 sets of gloves on each hand, ensuring wrists are covered.
10. Confirm with safety officer that all PPE is donned correctly.

PATIENT ARRIVAL

COVID-19 patients should be brought directly into the procedure room while wearing a surgical facemask. Shared spaces should be avoided. The procedure team should all be in full PPE when entering the room to speak to the patient.

PROCEDURE

A timeout should be performed, and all nonessential personnel should exit the room during intubation to limit the number of people exposed during intubation. Outside the room, personnel should stand in the "buffer zone" and avoid touching the doors. Once intubation is complete, the nurse in the room can open the door, allowing re-entrance to the room. If equipment is needed, the nurse can call to a runner outside the room to prepare the equipment. Equipment can be prepacked in kits, like a bleeding kit (sclerotherapy needle and endoclips). The nurse will open the inner door when the equipment is ready and receive it from the runner outside. When inserting and removing instruments from the endoscope channel, turn the handle left and down to minimize potential exposure during this process. Using gauze to cover the instrument channel on removal may be helpful. Once the procedure is nearing completion, the endoscopist should advise the team that the scope is being withdrawn. Using gauze to cover the endoscope, suctioning secretions on withdrawal, and having the nurse cover the mouth with gauze are all advisable.

MANAGEMENT OF ADVERSE EVENTS

The provider's safety is the priority. Make sure that responders to a CODE call do not enter the room if PPE is not appropriately donned. Management of an adverse event/CODE should proceed according to local protocols.

DOFFING OF PPE

If an area outside the room is designated as the "buffer zone" or "doffing box," PPE should be removed in this area, as follows:

1. Remove shoe covers (and/or leg covers if present).
2. Remove gown and gloves and then perform hand hygiene.
3. If wearing an eye shield, remove eye shield and perform hand hygiene.
4. Remove outer facemask and perform hand hygiene.
5. Remove N95 while leaning slightly forward, discard N95, and perform hand hygiene.
6. Remove bouffant and perform hand hygiene.
7. Apply a clean facemask and perform hand hygiene.
8. Ensure the safety officer is supervising the doffing sequence.

POSTPROCEDURE CONSIDERATIONS

After the procedure, the room should be left closed for 30 minutes to reduce any exposure to procedure-related droplets that might remain aerosolized. The room and endoscope can then be disinfected using routine hospital/institutional protocols for cleaning rooms and endoscopes.[2]

CONCLUSION

To keep providers safe during endoscopic procedures during the COVID-19 pandemic, it is critical that protocols are developed to maintain proper PPE and limit the risk of exposures. Simulations and flow diagrams are important tools to train staff on how to perform endoscopy safely.

DISCLOSURES

All authors disclosed no financial relationships.

Abbreviation: PPE, personal protective equipment.

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