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How to prepare the operating room for COVID-19 patients

Como preparar o centro cirúrgico para pacientes COVID-19

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INTRODUCTION

The pandemic caused by the new Coronavirus (SARS-CoV-2), the agent of the disease called Covid-19, generated an exponential increase in information, with the production of more than 2.000 scientific articles, technical standards, manuals and newsletters worldwide[1].

To interpret this information to transform it into operational and care actions has been a challenge for health services around the world, with an emphasis on job security, patient care assurance, avoidance of disregardful consumption of personal protective equipment (PPE), and especially combat against anxiety among health professionals.

JUSTIFICATION

On December 31, 2019, China alerted the World Health Organization (WHO)[2] about several cases of atypical pneumonia in Wuhan[3]. The first case in Brazil was confirmed on February 26, 2020[4], and on March 11, 2020, WHO declared the Covid-19 pandemic[5].

Community transmission cases in Brazil began to be reported in several cities across the country, and on March 20, 2020, the Ministry of Health (MOH) officially declared the situation of national community transmission[6].

SARS-CoV-2 has stability in aerosols and surfaces, being transmitted by suspended droplets and fomites, and can remain infectious for hours in aerosols, plastic surfaces, stainless steel, cardboard and copper. The amount of the inoculum and environmental conditions such as temperature and humidity can alter the viability of the viral particles. Symptomatic infected patients have a higher viral load and various medical procedures can contribute to the formation of aerosols[7].

Several Brazilian medical societies disclosed their guidelines to their associated on the need of restriction in elective care and use of PPE risk in procedures with risk of aerosolization, such as tracheal intubation and gastrointestinal endoscopy[8,9]. The Brazilian College of Surgeons (CBC), together with the Brazilian Society of Integrated Trauma Care (SBAIT) and the Brazilian Chapter of the American College of Surgeons oriented that "a hospital policy to manage patients in the operating room (OR) with known or suspected infection by COVID-19" be developed "in agreements with the anesthesia team"[10].

Thus, as part of the orientation to their professionals, several services around the world have implemented biosafety actions to deal with the current pandemic, including specific care in the preparation of the OR.

OBJECTIVE

To present guidelines that provide the right care and security conditions for health professionals in the prevention of human SARS-CoV2 infection transmission in the operating room.

METHOD

We carried out a research for papers and other publications using the terms "covid-19", "coronavirus",

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"operating room", in the database PubMed, from March 17 to April 14, 2020.

RESULTS

We found 19 articles in the search base. After reading the abstracts, we selected six articles, of which we could access five full texts, in addition to four others chosen for dissemination, totaling nine full articles. We also included official regulations and technical standards.

GUIDELINES

Operating room

• There should be a dedicated room for COVID patient care, preferably an easily accessible area, with a minimal contact possible with other rooms, to prevent contamination of large extension the[11-13].

• The patient should arrive through an exclusive door (when possible), located next to the dedicated room for the Covid-19 patient. The patient must leave through the same access[11,12].

• The dedicated room for the Covid-19 patient should have an anteroom[11,14].

• The room temperature should be kept adequate to ensure neutral or negative pressure[11-16]. When there is no negative pressure option, it is important to allow at least 30 minutes between cases for complete exchange of the ambient air[15].

• Doors should remain closed during the procedure[13,16].

• There should be a sign at the room's door regarding the recommended precaution (contact and aerosol).

Equipments

• Only equipment, furniture and necessary medicines should be taken to the procedure room, to reduce the number of items that need to be cleaned or discarded[12,13].

• The use of disposable equipment / materials should be prioritized[11-14].

• The anesthesia machines, monitors, ultrasound devices and such should be protected with disposable plastic to reduce equipment contamination[12].

• High-Efficiency Particulate Air (HEPA) filters should be used in the anesthesia circuit, with the capnography system set between the circuit and the filter[12].

General care

• Wash hands before and after placing and removing the PPE[11-13,16-18].

• No use of adornments[18].

• No entering the OR with personal effects.

• Use of appropriate Personal Protective Equipment (PPE) (cap, waterproof apron, glasses, face shield, N95 mask, gloves with long cuffs, closed and waterproof shoes that can be disinfected) – according to the PPE use guidelines in COVID 19 suspected cases[13,19].

Transportation/Reception

• Any transport of a suspected or confirmed COVID-19 patient to the OR must be previously communicated in order for the team to gear up.

• Put a surgical mask on the patient during transfer between areas[12,13,19].

• Professionals who perform patient transport to the OR and vice versa should use PPE (N95 masks, face shield/goggles, aprons and gloves)[11,13,16,19].

• Ensure there is no obstruction in the patient's way[11].

• Reserve the elevator next to the OR to carry the patient and block its use for hygiene after transport[11,13].

• The OR staff should wait for the the patient properly vested[11,16,19].

• The patient should not remain in the reception or preoperative area, being taken directly to the OR[11,13].

Team

• The team participating in the surgery should be as small as possible[12-14,16,17,20].

• During airways manipulation (intubation and extubation), the team not involved in the procedure should stay out of the room[13,21].

• A support professional should be available outside the room, ensuring compliance to precaution techniques[11,13,15,17].

• Surgeons and assistants should wear an N95 mask with a surgical mask on top, complete face shield, apron, gloves and shoe protection[13,19].

Procedures

• Anesthetic blockades should be preferred whenever possible, avoiding handling airways[11,12,16,17].

• Intubated patients from intensive care units should have their endotracheal tubes occluded by grasping forceps in the need of ventilator change, to prevent aerosols leakage[11,12].

• Reduce the production of aerosols, with the judicious use of electrocautery, maintaining continuous suction and care during laparoscopy; whenever possible, use a filter to deflate the pneumoperitoneum[13,20,21].

Postoperative period

• The postoperative recovery should be performed inside the room and the patient should remain with a surgical mask; if there is need for complementary oxygen, the oxygen catheter should be placed under the mask[11,12,14,16,17].

• Non-invasive airway support with positive pressure should be avoided to the maximum, since it can cause aerosolization of the virus[12].

• The patient in conditions of discharge from anesthesia should wear a surgical mask for transportation, and the transport professionals should use PPEs, as recommended for handling suspected COVID-19 cases[12,19].

Disrobing

• All PPEs, including N95 masks, but excluding goggles, face masks, and waterproof shoes, should be discarded (preferably in the anteroom) after use in procedures that generate aerosolization (ie: intubation, extubation, aspiration, cardiopulmonary resuscitation, non invasive ventilation, and bronchoscopy) or in the presence of contamination by blood or other body fluids[11].

• Preferably remove the PPEs in the anteroom[11,19].

• No touching the face before sanitizing the hands[19].

• Sprinkling shower in the locker room[11,12].

• Cleaning of goggles with soap and water, applying 70% alcohol after drying[19].

Hygiene and Disposal

• Provide one hour between procedures for patient transfer and cleaning and decontamination of all surfaces, screens, keyboard, computers, cables, monitors, anesthesia machines, and furniture[11,15].

• Leave the room prepared for the next procedure[11,15].

• Change the whole circuit, the filter, the soda lime, and disinfect the anesthesia machine, as well as the soda lime compartment after each surgery[11].

• Thorough cleaning of the equipment and furniture of the operating room, using PPE (n95 masks, faceshield / goggles, aprons and gloves)[11,13].

• Discard all PPEs in the infectious waste[11,12].

• Discard all unused items from the medicine tray and airways car, since they should be considered contaminated[11,12].

• All materials and instruments should be sent to the purge inside large plastic boxes with the lid completely closed and with written identification that is easy to be seen by the team of the Material and Sterilization Center (MSC).

CONCLUSION

Health care workers are at risk during the new SARS-CoV-2 coronavirus pandemic. Orientations and institutional guidelines for the preparation and the proper use of PPE help reduce the team's anxiety and likelihood of contamination[15], while ensuring patient care. Even if no suspected or confirmed Covid-19 patient has been operated, this is expected to change soon, as the number of cases increases[12].

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