

SURGICAL CENTER: RECOMMENDATIONS FOR THE CARE OF PATIENTS WITH SUSPECTED OR CONFIRMED COVID-19

Centro cirúrgico: recomendações para o atendimento de pacientes com suspeita ou portadores de covid-19

Centro quirúrgico: recomendaciones para el cuidado de pacientes con covid-19 sospechado o confirmado

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ABSTRACT: Objective: To present the recommendations to reorganize surgical center in the care of patients with suspected or confirmed COVID-19. **Method:** Critical literature review of the literature, with publications from 2019 and 2020 related to scientific production, technical standards, guidelines and recommendations of societies for managing the surgical center in the care of patients during the new coronavirus pandemic. **Results:** The management of human and material resources is essential to meet the perioperative care demand; reorganize surgical procedures; ensure the safety of health professionals; organize an operating room with required materials; plan the patient's post-anesthetic recovery; and perform cleaning and disinfection of the operating room. **Conclusion:** The recommendations direct nurses to apply best practices in patient care, in line with scientific evidence recommended by reference institutions, to promote safe and quality care for patients and professionals. **Keywords:** Surgical centers. Perioperative care. Crew resource management, healthcare. Pandemics. Coronavirus infections.

RESUMO: Objetivo: Apresentar as recomendações para reorganização do centro cirúrgico no atendimento a pacientes com suspeita ou confirmação de COVID-19. **Método:** Revisão crítica da literatura, com publicações dos anos de 2019 e 2020 relacionadas à produção científica, a normas técnicas, às diretrizes e recomendações de sociedades, para o gerenciamento do centro cirúrgico na assistência a pacientes durante a pandemia do novo coronavírus. **Resultados:** A gestão dos recursos humanos e materiais é primordial para: atender à demanda assistencial perioperatória; reorganizar os procedimentos cirúrgicos; garantir a segurança dos profissionais de saúde; organizar a sala cirúrgica com materiais necessários; planejar a recuperação pós-anestésica do paciente; e realizar limpeza e desinfecção da sala cirúrgica. **Conclusão:** As recomendações apresentadas direcionam os enfermeiros a aplicar as melhores práticas no atendimento aos pacientes, em consonância com evidências científicas recomendadas por instituições de referência, para promoção de assistência segura e de qualidade aos pacientes e profissionais. **Palavras-chave:** Centros cirúrgicos. Assistência perioperatória. Gestão de recursos da equipe de assistência à saúde. Pandemias. Infecções por coronavírus.

RESUMEN: Objetivo: presentar las recomendaciones para la reorganización del Centro Quirúrgico en la atención de pacientes con COVID-19 sospechado o confirmado. **Método:** Revisión crítica de la literatura, con publicaciones de los años 2019 y 2020, relacionadas con producción científica, estándares técnicos, Guías y Recomendaciones de Sociedades, para el manejo del CQ en la asistencia a pacientes durante la pandemia del nuevo coronavirus. **Resultados:** La gestión de los recursos humanos y materiales es fundamental para atender la demanda de cuidados perioperatorios, reorganizar los procedimientos quirúrgicos; garantizar la seguridad de los profesionales de la salud; organizar el quirófano con los materiales necesarios; planificar la recuperación postanestésica del paciente y realizar la limpieza y desinfección del quirófano. **Conclusión:** Las recomendaciones presentadas a enfermeras directas para aplicar las mejores prácticas en la atención al paciente, en línea con la evidencia científica recomendada por las instituciones de referencia, para promover una atención segura y de calidad a pacientes y profesionales. **Palabras clave:** Centros quirúrgicos. Atención perioperativa. Gestión de recursos de personal en salud. Pandemias. Infecciones por coronavirus.

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INTRODUCTION

December 2019 will be marked in the history of humanity as the month in which a series of pneumonia cases of unknown etiology broke out in Wuhan City, China, which would culminated in a pandemic with characteristics not yet experienced in the 21st century. With the sequencing of the viral agent genome by the Chinese Center for Disease Control and Prevention, the virus could be identified as belonging to the Coronavirus family, later named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).¹ Between December 2019 and March 2020, coronavirus disease (COVID-19) reached all continents, becoming a pandemic,² with the first cases recorded in Brazil in February 2020.³

The World Health Organization (WHO) named the COVID-19 and classified it into two different or complementary forms of manifestation.⁴⁻⁶ This disease can manifest itself with milder symptoms, such as fever, cough, sore throat, and headache; or severe acute respiratory syndrome (SARS), with more severe symptoms, such as dyspnea, tachypnea, and hypoxemia, leading to death.⁷ Therefore, symptoms may evolve, leading patients to hospitalization and treatment in intensive care units (ICU).¹

Faced with the context of a global crisis caused by the pandemic, the reorganization of health services to meet the growing assistance demand has become imminent.^{8,9} Worldwide, health institutions are being mobilizing and are building safety protocols to care for patients with suspected COVID-19 and for those who may carry the disease, considering airway contact via droplets or aerosols as the main route of transmission.^{4,6,10} Procedures for manipulating the respiratory tract, such as intubation, endotracheal aspiration, and extubation, involving aerosolization of particles, are evaluated as high risk and can infect health professionals.^{5,6,11}

The removal and death of several health professionals worldwide, especially those on front lines, such as nursing professionals and doctors, mobilized federal councils in Brazil, which developed and published specific recommendations to prevent these professionals from being contaminated. The Brazilian Nursing Council (*Conselho Federal de Enfermagem - Cofen*) published two versions of the general recommendations for organizing health services and preparing nursing teams during the pandemic.² With regard to anesthetic-surgical procedures,

scheduling scales are thought to assist urgent and emergency interventions, in order to prioritize care for victims of COVID-19.^{9,13,14}

International surgical associations, such as the American College of Surgeons, American Society of Anesthesiologists, Association of periOperative Registered Nurses, and American Hospital Association also recommended the suspension of elective surgeries during the COVID-19 pandemic and worked together, drafting a joint statement that contains a script with principles and questions to be evaluated in planning the resumption of elective surgeries.¹⁵ This script recommends the return of elective surgeries only if the city meets the following criteria:

- stable reduction in new COVID-19 cases in the geographical area for at least 14 days;
- authorization by health authorities;
- ability to safely treat all patients who need hospitalization;
- adequate number of beds;
- availability of sufficient personal protective equipment (PPE) for the work team;
- forecasting and supplying necessary medications and supplies;
- adequate number of employees trained to care, without compromising safety.¹⁵

Nurses are considered to be the fundamental professionals for reorganizing perioperative care, meeting the exceptional and necessary demand to offer safety to professionals and patients during this public health emergency. Thus, summarizing recent publications with guidelines on essential practices in the Surgical Center (SC), assisting nurses in this task force is of utmost importance. To this end, we sought to review the recommendations essential to the adequacy of the SC in the care of patients with suspected or confirmed COVID-19.

In this context, the research question was: What are the best practices mentioned in the literature on the care of people with COVID-19 in the SC?

OBJECTIVE

To present the existing recommendations for the reorganization of the Surgical Center (SC) in the care of patients with suspected or confirmed COVID-19, ensuring safety for patients and the multidisciplinary team.

METHOD

This is a critical literature review, with publications from 2019 and 2020 related to scientific production, technical standards, as well as guidelines and recommendations of societies to manage the SC in the care of patients during the new coronavirus pandemic. The critical point of view focused on the analysis of the recommendations issued in this production, intending to know them to support the SC reorganization in the care of patients with suspected or confirmed COVID-19.

RESULTS

Recommendations published by the following bodies, companies or associations, national and international were selected:

- Brazilian Association of Surgical Center Nurses, Anesthetic Recovery and Material and Sterilization Center (*Associação Brasileira de Enfermeiros de Centro Cirúrgico, Recuperação Anestésica e Centro de Material e Esterilização*);
- Association of periOperative Registered Nurses (AORN);
- Brazilian Health Regulatory Agency (*Agência Nacional de Vigilância Sanitária - ANVISA*);
- Brazilian Society of Anesthesiology (*Sociedade Brasileira de Anestesiologia*);
- American College of Surgeons;
- American Society of Anesthesiologists;
- American Hospital Association;
- Centers for Disease Control and Prevention.

Since the construction of the present article took place at the beginning of the pandemic, when the theme was new, recent publications from internationally recognized scientific journals were selected, totaling five articles, which supported the critical analysis.

After reading the selected materials, the existing recommendations for reorganizing the SC in the care of patients with suspected or confirmed COVID-19 were identified, resulting in the following topics addressed:

- reorganization of surgical procedures;
- safety of health professionals;
- operating room organization;
- patient's post-anesthetic recovery;
- cleaning and disinfection of the operating room.

DISCUSSION

Reorganization of surgical procedures: a new reality

For the organization of SCs throughout Brazil during the COVID-19 pandemic, several discussions on the recommendations of the world scientific community points to the suspension of elective procedures, reducing the contingent of circulation in institutions and prioritizing patients of urgent, emergency, and cancer procedures.¹³⁻¹⁵

Other relevant actions are to provide the necessary health supplies — such as surgical masks, N95 masks, personal protective aprons, and ventilatory assistance materials⁸ — and optimize them for the care of patients with COVID-19, both in their screening process and in protecting the professionals involved.

Considering that COVID-19 is a new disease, it still requires epidemiological monitoring to know its potential for contamination beyond the respiratory tract. Therefore, it still requires research that identifies etiological factors related to its development and prevention.⁸

The orientation is that patients with positive COVID-19 should not undergo surgery at this time, unless they have a life-threatening emergency, or if the surgery cannot be postponed. In cases of patients with unknown COVID-19 status, the ideal is performing the preoperative test and, in the case of care, always using PPE.^{8,13} The difficult decision to postpone the procedure is often essential in the face of this global situation,⁹ which benefits health professionals and patients.¹⁶

In laparoscopic surgeries, the maintenance of artificial pneumoperitoneum can expose the surgical team to the risk of contamination with aerosols. Previous studies referring to other viruses show that these organisms are dispersed through the pneumoperitoneum expulsion gases and trocars.^{8,16,17} Special management should be adopted during laparoscopy, with the control of pneumoperitoneum pressure to a minimum, without, however, compromising the vision of the surgical field. Likewise, cautery should be used with less power and aspiration with filtration during the removal of smoke and aerosols.^{8,14,16-18}

Safety of health professionals

In the organization of health institutions to meet the anesthetic-surgical procedures of suspected and confirmed patients

of COVID-19, the health team should consider discarding the participation of employees from risk groups (diabetes, hypertension, and cardiovascular diseases,^{6,12} age over 60, chronic respiratory or kidney disease, patients with tuberculosis and leprosy, or other chronic infectious diseases, transplanted from solid organs and bone marrow, immunosuppression by diseases and/or drugs, patients with chromosomal diseases and with states of immunological fragility, in addition to pregnant women).¹² Changing shifts among employees is recommended to care for these patients, as well as relocation of pregnant and lactating employees so that there is no risk of direct contact with suspected or confirmed patients for coronavirus infection.¹²

For protection against the risk of contamination, the use of any type of adornment (wedding rings, chains, rings, watches, earrings, and badges hanging from a cord) should be prohibited, because they make it difficult to clean hands properly and also encourage the accumulation of microorganisms.^{6,12}

Professionals must have adequate training and understanding to use and take off PPE,^{6,13} cap, disposable apron or cloak, N95 mask, glasses or face protection, closed and waterproof gloves, and shoes.^{6,11,12,16,17} Although ANVISA does not recommend the use of two gloves (double glove),⁵ a systematic review concluded that there is no evidence that additional protection reduces infection in the patient. However, the second pair of gloves significantly reduces the perforations in the internal gloves,¹⁹ which can become a protection for the surgical team. The use of two gloves as a way to reduce the risk of self-contamination is recommended, changing the pair of external gloves whenever there is contact with blood and fluids, keeping the pair of internal gloves, if they are clean.¹¹ AORN advises that all vested members of the surgical team wear two pairs of sterile gloves.²⁰ In turn, the authors of the present article believe in the following: it is better to adopt excess of care than lack of it. Hand hygiene with water and soap or 70% alcohol must be performed before and after wearing PPE, in the five moments recommended by WHO: before touching the patient, before performing aseptic procedures, after touching the patient, after the risk of exposure to body fluids, and after contact with areas close to the patient.^{5,6}

N95 masks must be used, because they offer protection from aerosols.^{6,10,13,15,16} Their prolonged use, that is, not removing the device for six to eight hours, can be implanted when caring for patients with COVID-19.^{6,21} With regard to the controversial aspect of reusing these masks, there is no consensus as to the number of times safe for reuse yet.

Some considerations discourage reuse, due to the risk of contamination by the professional when handling them.⁶ However, given the context of rationing and optimization of health supplies, professionals need training for the proper implementation of reusing such masks, according to current recommendations.²¹ The mask must be changed after performing aerosol-generating procedures, when there is contamination by blood and other secretions, or after attending a patient with co-infection that requires contact precaution.⁶

Before scheduling procedures and organizing the work schedule, as from the admission to the SC, professionals need to be using all PPE to receive the patient with COVID-19, who must be taken directly to the operating room, and must not stay in receptions or pre-operative rooms.⁶ During the procedure, all professionals must have full PPE, keep the operating room doors closed until its end and place an identification on the room door alerting for a patient protocol with COVID-19.⁶

Paying special attention to take off PPE is essential due to the risk of contamination by the professional.⁶ According to the recommendations of ANVISA,⁵ taking off the vest must be done as follows:

- still inside the room: remove gloves and apron, and disinfect hands;
- when leaving the room: washing the hands, removing the hat, goggles or face shield, washing the hands, removing the N95 mask, washing the hands;
- at the end: cleaning the goggles or face shield.

After the procedure, all professionals should bathe before continuing their duties.^{6,16}

To transport the patient, professionals must be wearing PPE and the patient must wear a surgical mask.⁵ In procedures with aerosolization of respiratory secretions, the use of N95 mask is imperative.^{5,11}

Operating room organization

Upon surgical scheduling, patients with suspected or confirmed coronavirus infection must be reported.^{6,13} Using the same operating room to care for patients with suspected or confirmed COVID-19 until the end of the pandemic is suggested, as well as ensuring that there is a minimum scheduling interval of one hour between two procedures, time defined for disinfecting the room.^{6,16}

Providing the same operating room and the same specific anesthesia machine to assist these patients until the end

of the pandemic is also recommended.^{6,11} Procedures with aerosol generation, such as intubation, should preferably be carried out in a room with negative pressure or air conditioning turned off (neutral pressure).^{5,6,10,17}

Intubation should be performed by the most experienced professional, by rapid sequence induction, to avoid manual ventilation inside the patient's mask. Intubation with the patient awake must be avoided and closed suction circuits must be used.¹¹ Using a bacterial/viral filter with efficiency greater than 99.5% HMEF (heat and moisture exchangers) barrier is another recommendation, connected between the patient's tube and the ventilation circuit. If possible, using a bacterial filter to filter the exhaled air should be adopted, in case of filter failures near the patient, and a third bacterial filter in the inspired air line.^{6,10} If available, a video laryngoscope should be used to minimize closeness with the patient's face.^{11,13} In need of changing the fan, a grasping forceps is needed to occlude the tube and avoid generating aerosols.^{6,11,13}

Prioritizing disposable equipment and materials in the operating room, with kit assembly, is highly recommended. All unused material that entered the operating room must be discarded.⁶ In the operating room, keeping only what is strictly necessary is the goal. Materials that remain in the operating room, such as equipment, anesthesia equipment, and monitors, must be covered with waterproof and disposable fields in order to reduce contamination and facilitate cleaning.^{6,22}

The entire team must wear PPE in an appropriate manner to receive the patient, sent directly to the operating room, using effective communication between all its members.^{6,11} As for the number of professionals, it is recommended to restrict it to what is required for the procedure to be performed,^{6,14} indicating that a circulating nursing technician should be available in the external area to attend the operating room and promote better adherence to the recommendations, as well as disposing, inside the operating room, of only essential materials.^{5,6,13,16}

Patient's post-anesthetic recovery

Given the risk of spreading COVID-19, patients with a suspected or confirmed diagnosis of coronavirus who do not need to be transferred to the ICU for recovery must remain in the operating room until their complete recovery. This is because the team is already properly attired with the PPE for care to be carried out, in order to avoid contact with other people.^{6,11,16}

Recommendations guide patients to remain throughout their recovery and be transported directly to the destination unit with a surgical mask and, if necessary, with oxygen support, which should be inside the mask.⁶ After discharge from the SC, the aprons and gloves used by professionals must be removed inside the operating room.^{6,16}

Operating room cleaning and disinfection

Cleaning the room must only start after the patient leaves.¹⁸ When taking off the vestment, double gloving is recommended, and the first glove should be changed whenever there is contact with contaminated material.⁶ The nursing team is responsible for organizing instruments in hermetically sealed and identified plastic containers to prevent possible contamination, and to send them to the institution's materials and sterilization center,^{5,6} as well as to change the entire airway circuit, soda lime, filters, and disinfect the anesthesia machine and soda lime canister.^{6,11}

For cleaning the operating room, complete use of PPE is recommended to prevent contact and aerosols, keeping negative pressure or air conditioning off.⁶ Thorough cleaning of surfaces and equipment must be performed.^{5,13} Disinfection of surfaces should only be carried out after cleaning.⁵ Surface cleaning should be done with neutral detergent, followed by disinfection.¹³ Disinfection can be done with 70% alcohol, sodium hypochlorite, products based on quaternary ammonium compounds, or another disinfectant designed for this purpose.^{5,12,13,23} There are specific recommendations for cleaning and disinfecting surfaces that have had contact with a suspected or confirmed COVID-19 patient with solutions based on quaternary ammonium or sodium hypochlorite.⁶

Cleaning with maximum efficiency is recommended, with special attention to surfaces close to the patient (operating table, chairs, among others), including electronic equipment (infusion pumps, monitors, screens, cables, and others), furniture,^{5,6,16,22} anesthesia machine,^{6,22} especially in frequently touched areas (switches, knobs, buttons, and controls).²² Visible dirt (blood and secretions) must be removed with paper towels and cleaned before disinfection.¹⁶

Hospitals must establish a unidirectional cleaning method and sequence, from the cleanest to the dirtiest place.²² After cleaning equipment and surfaces, final cleaning must be performed by the cleaning team, which must include walls and floors.¹⁸ A checklist should be used to standardize and ensure that all items and cleaning procedures are performed.²²

There are no special recommendations for washing contaminated clothing, but care must be taken in transporting and handling them.^{5,22}

All waste from care procedures must be considered in category A1, according to the Resolution of the Collegiate Board (*Resolução da Diretoria Colegiada - RDC*) No. 222, of March 28, 2018, by ANVISA,^{6,22,24} and discarded in a specific bag of infectious waste.^{5,6}

Study limitations

Given the exceptionality of the current scenario, a study limitation is the constant updating of publications related to the theme, restricted to recommendations by societies and specialists, as well as those based on studies regarding past epidemics. However, there is still little research on the new coronavirus and the effectiveness of the measures recommended by experts in the COVID-19 pandemic panorama.

Contributions to practice

In view of the current pandemic scenario, which requires health services to reorganize their workflows, professionals must have sufficient knowledge about prevention and control measures.

In this way, the present study contributes as a literature synthesis, providing fundamental information and evidence, as well as subsidies, for the maintenance of health and safety during the COVID-19 pandemic in the perioperative scope.

FINAL CONSIDERATIONS

The review of existing recommendations for the reorganization of the SC in the care for patients with suspected or confirmed COVID-19 was conducted, ensuring safety for patients and the multidisciplinary team.

Among the recommendations pointed out, we highlight the management of human and material resources to meet the perioperative care demand, with reorganization of elective surgical procedures, guaranteeing the safety of health professionals, organization of the operating room with required materials, planning of post-recovery anesthetic treatment, and cleaning and disinfection of the operating room.

The objective of this article is to contribute, in order to share with professionals in the area, with the main updated recommendations for care in the perioperative context. Thus, quality and safe care is sought for all individuals involved in this process, from scheduling surgery to post-surgical recovery.

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