

QUALITY AND SAFETY: INFECTION CONTROL, BIOSAFETY AND REPROCESSING

Health institutions through the Crisis Management Committee, the “Infection Prevention and Control Service” (SCIH) and the “Specialized Service in Safety Engineering and Occupational Medicine” (SESMT) should discuss ways to reduce the transmission of microorganisms regarding the use of materials and devices. Especially at this time when estimates indicate that in the coming weeks, we may experience an important increase in the number of cases in Brazil. Prevention and control measures must be adopted when assisting suspected or confirmed cases of infection by the new coronavirus (SARS-CoV-2).

Care Environment Control Measures

- Equipment for shared use among people (for example, stethoscopes, apparatus for measuring blood pressure and thermometers) must be cleaned and disinfected after use;
- Properly hygiene your hands frequently, respecting the five hygiene moments;
- Use PPE to avoid direct contact with body fluids;
- Provide a surgical mask to the person with suspected infection with the new coronavirus, or person who has or had contact with the suspected or confirmed case, and to refer to a separate area or isolation room;
- Prevent injury, needle injury or sharp objects; safe waste management;
- Limit aerosol-inducing procedures (intubation, suction, fogging);
- Perform equipment disinfection and cleaning the environment on bathroom floors and surfaces;

- Properly dispose of waste, according to Anvisa's health service waste management technical regulation.

Use of Personal Protective Equipment

In addition to the availability of personal protective equipment (PPE): apron or cloak, regular mask, PFF2 / PFF3 respirator or N95 mask, eye or face protection, cap and procedure gloves with long cuffs, it is extremely important that professionals are trained about hand hygiene technique, standard precaution, precaution for contact, precaution for droplets, precaution for aerosols and correct use of PPE (placement and removal).

The PFF2 / PFF3 respirator or N95 mask should be used by healthcare professionals who perform aerosol-generating procedures such as: intubation or tracheal aspiration, invasive and non-invasive mechanical ventilation, cardiopulmonary resuscitation, manual ventilation before intubation, collections of nasotracheal samples.

Attention: NEVER attempt to clean the mask already used with any type of product. Surgical masks are disposable and cannot be cleaned or disinfected for later use and when wet they lose their filtration capacity.

There is no scientific evidence of the possibility of reusing N95 masks after disinfection and sterilization, despite studies still underway to assess the effectiveness of this practice.

Biosafety Recommendations

A-) ENDOSCOPY / BRONCOSCOPY SERVICES AND PROCESSING OF ENDOSCOPIC EQUIPMENT:

All patients with indication for performing endoscopic or bronchoscopic procedures are at high risk due to the dispersion of particles or aerosolization of body substances during the procedure in handling the airways (bronchoscopy, airway aspiration, in-tubing / extubation). In this way, measures of individual protection and processing of safe equipment become essential and fundamental to guarantee the care and occupational safety of patients and employees.

- **General measures to prevent the spread of respiratory infections**

Considering that the transmission of the coronavirus occurs mainly via respiratory or contact, and that many carriers are asymptomatic, oligosymptomatic or undiagnosed, the application of priority criteria for the performance of urgent or emergency procedures should be considered, evaluating the possibility of postponing elective procedures.

Strengthening the communication channels with patients and companions should also be considered. Visual alerts about signs and symptoms should be clearly visible at reception, as well as guidance on hand hygiene, respiratory hygiene, cough etiquette, sneezing and correct use of a mask.

Provide conditions for hand hygiene, restrict sharing of items such as a pen / clipboard, increase the frequency of cleaning the environment and surfaces of environments used by patients.

Patients with suspected Coronavirus infection (SARS-CoV-2) should preferably remain in a separate area or be transported to the site of the procedure immediately before the procedure.

- **Room preparation**

Endoscopic procedures generate aerosols and therefore should be performed preferably in a respiratory isolation unit with negative pressure and

HEPA filter (High Efficiency Particulate Arrestance). In the absence of a HEPA filter, switch off the air conditioner. In addition, the mandatory use of respiratory protection (type N95, PFF2 / PFF3) by health professionals should be guided.

The use of disposable equipment and materials should be prioritized, and only necessary equipment, furniture and medication should be taken to the procedure room to reduce the number of items that will need to be cleaned or disposed of.

Provide, if possible, a tube for intubation with closed circuit for airways aspiration in order to avoid generating aerosols and protect the anesthesia device with disposable plastic to reduce its contamination.

- **Patient transport**

Patients with symptoms of respiratory infection (fever, coughing, sneezing, difficulty breathing) should wear a surgical mask during transport.

Health professionals and support professionals who provide assistance less than 1 meter from the suspected or confirmed COVID-19 patient must wear PPE (cloak / apron; surgical mask; eye or face shield; long-sleeved gloves).

- **Endoscopic procedures**

Endoscopic procedures are considered risky. The risk of respiratory exposure of professionals is due to the proximity that remains with the patient, in addition to the risk of generating aerosols in procedures such as bronchoscopy. This exposure risk is not limited to high endoscopy procedures, considering the recent detection of SARS-CoV in biopsy samples and feces, suggesting a possible fecal-oral transmission.

In general, the establishment of infection prevention measures in the endoscopy service is essential to create a safe environment to protect patients and professionals. In this new era of the COVID-19 pandemic, it is imperative that these measures are implemented and maintained to avoid the unrecognized spread of the disease.

During endoscopic procedures, it is mandatory that all professionals who are inside the procedure room, wear PPE (hat; apron; N95 mask or PFF2 / PFF3 respirator; eye or face protection and double gloves for long-barreled procedures).

The number of professionals inside the room should be restricted to the minimum and the doors closed during the procedure to avoid unnecessary exposures.

It is also recommended, whenever possible, to perform endoscopic procedures in a room with negative pressure in patients with confirmation of COVID-19.

Before leaving the room, professionals should discard the aprons and gloves used.

- **Post endoscopic procedure**

If complementary oxygen is needed: avoid using Venturi mask as much as possible, as it may favor aerosolization of the virus.

- **Dismantling the room**

All items not used during the procedure must be considered contaminated. Permanent materials must be sent for processing in closed plastic boxes to avoid dispersion of particles and the other items must be discarded.

The stability of the SARS-CoV-2 aerosol on the surface can reach 72 hours, so the terminal cleaning must be carried out in a thorough way in the equipment and furniture of the procedure room, using PPE indicated for precaution of contact and aerosols. The cleaning and decontamination of all surfaces, screens, keyboard, cables, monitors and anesthesia equipment according to local protocol.

- **Processing of endoscopic devices**

Endoscopic equipment is classified as critical, and therefore, must be subjected to high-level disinfection.

- **Pre-cleaning**

When dismantling the room, use double glove (the first glove must be removed after handling the contaminated material so that there is no contamination when handling the packaging).

Accommodate materials that have met airways, in airtight plastic packaging, in order to ensure the safe transport of potentially contaminated material.

Carry out the internal and external cleaning of the transport packaging, according to the institutional protocol. The professional should use the appropriate PPE to minimize the risk of contamination.

- **Cleaning**

Cleaning must be carried out rigorously in order to guarantee the maximum reduction of microbial load and to ensure safe processing.

In the reception and cleaning area, Material and Sterilization Center professionals must wear a N95 mask, long-sleeved waterproof aprons, high-top rubberized gloves, waterproof and closed shoes, caps and glasses or face protector.

Avoid cleaning methods that cause aerosolization of particles such as compressed air guns.

Whenever possible, opt for automated cleaning methods (preferably use the thermal disinfectant to reduce health risks for health professionals when handling materials potentially contaminated with COVID-19).

- **Disinfection**

High-level disinfection should be carried out, preferably using automated methods, which allow for adequate monitoring of the process.

- **Sterilization**

Materials or devices classified as critical (who have contact with sterile body structures), must be sterilized.

B-) PROCESSING INHALATORY MATERIALS:

In the processing of ventilatory assistance articles, the national literature and technical manuals published on the topic recommend cleaning and then high-level disinfection by moist heat at temperatures above 70 ° C for 30 minutes or steam sterilization under pressure.

Ventilatory assistance articles classified as critical, such as endotracheal tubes and tracheostomies should be discarded after use. Ventilatory assistance articles classified as semi-critical (nebulizers, humidifiers, inhalers, and respiratory circuits) must be subjected to high-level disinfection. Ventilatory assistance articles classified as non-critical (thermometers, pulse oximeters), perform low-level cleaning and disinfection.

C-) CLEANING AND DISINFECTION OF ULTRASOUND EQUIPMENT AND TRANSDUCERS:

The coronavirus is surrounded by a lipid capsid that makes it particularly sensitive to disinfectants for routine use. There is evidence that the virus effectively inactivates with appropriate procedures that include the use of common disinfectants in diagnostic clinics and hospitals. The World Health Organization (WHO) suggests that “the complete cleaning of the surfaces of the environment with water and detergent for hospital use, followed by the application of disinfectants commonly used in health institutions” are effective and sufficient procedures to inactivate the new coronavirus .

For the disinfection of the transducers to be effective for any transmissible pathogen, the following can be used: 0.5% sodium hypochlorite; quartile of quaternary ammonia in total concentration of use is less than 0.8%; hydrogen peroxide to a maximum of 0.5% or 70% alcohol.

It must be considered that not all cleaning solutions are compatible with the transducers. Therefore, it is recommended to consult the maintenance and cleaning manuals for each device, which contain information on which products can be used to ensure patient safety without damaging the equipment.

- **Conductive Gel**

To avoid contamination of the ultrasound gel, it is recommended to cover the bottle and not allow the gel container to touch the patient's skin or the surface of the transducer.

- **Surfaces and environment**

Proper cleaning of benches, keyboards and mice can be done with products already standardized in the institution.

For cases without suspected COVID-19, without epidemiology and without respiratory symptoms, the usual disinfection is performed and the room (and the equipment) is released for exams, right afterwards. After carrying out tests on patients with high suspicion or with confirmed COVID-19, it will be necessary to proceed with the disinfection recommended above and the room (and equipment) can be used again later if the patient has all the recommended PPE . If aerosols have been produced or a patient has been released, after disinfection, wait 2 hours to use it.

D-) PROCESSING OF SURGICAL INSTRUMENTALS:

All protocols involving postoperative cleaning and disinfection must comply with local instructions. The devices used in patients with suspected or proven COVID-19 infection, must be subjected to separate disinfection, followed by appropriate labeling. It is mandatory to specifically label and dispose of clinical waste separately.

E-) DIALYSIS SERVICES:

It is extremely important that dialysis services establish strategies to identify suspected or confirmed cases of the Coronavirus (SARS-CoV-2), even before arriving at the service or treatment area, making the team plan the care for these patients. (schedule review, place where the patient will undergo dialysis, etc.).

The dialysis lines and dialyzers used in patients suspected or confirmed of infection by the new coronavirus (SARS-Cov-2) must be discarded after use, and thus cannot be reused, even for the patient himself.

Use health products exclusively for patients suspected or confirmed to have COVID-19 (thermometers, sphygmomanometers, etc.). In case it is not possible, proceed to a rigorous cleaning and disinfection after its use (70% liquid alcohol can be used, if the products and equipment are not fabrics).

F-) WASTE TREATMENT:

According to what is known so far, the new coronavirus can be classified as a biological agent at risk class 3, following the Risk Classification of Biological Agents, published in 2017, by the Ministry of Health.

Therefore, all residues from assistance to patients suspected or confirmed of infection with the new coronavirus (COVID-19) must be included in category A1, according to Resolution RDC / Anvisa no 222, of March 28, 2018.

The waste must be packed in red bags, which must be replaced when they reach 2/3 of their capacity or at least once every 48 hours, regardless of the volume and identified by the symbol of an infectious substance. The bags must be contained in washable material containers, resistant to puncture, rupture, leakage, and tipping, with a lid provided with an opening system without manual contact, with rounded corners. These wastes must be treated before the final environmentally appropriate disposal.

It should also be noted that, according to RDC / Anvisa No. 222/18, health services must prepare a Health Services Waste Management Plan - PGRSS, which is the document that points out and describes all actions related to the management of waste from health services, observing their characteristics and

risks, considering aspects related to generation, identification, segregation, packaging, collection, storage, transportation, destination and final disposal, as well as health protection actions public health, workers and the environment.

REFERENCES:

1. <https://coronavirus.saude.gov.br> - Acesso: 23/03/2020, às 18h50.
2. Nota Técnica Gvims/Ggtes/Anvisa No 04/2020. Orientações Para Serviços De Saúde: Medidas De Prevenção E Controle Que Devem Ser Adotadas Durante A Assistência Aos Casos Suspeitos Ou Confirmados De Infecção Pelo Novo Coronavírus (SARS-CoV-2). (atualizada em 21/03/2020). Gerência de Vigilância e Monitoramento em Serviços de Saúde; Gerência Geral de Tecnologia em Serviços de Saúde e Agência Nacional de Vigilância Sanitária.
3. Recomendações relacionadas ao fluxo de atendimento para pacientes com suspeita ou infecção confirmada pelo COVID-19 em procedimentos cirúrgicos ou endoscópicos – SOBECC.
4. Atualização recomendações SOBED para endoscopia segura durante a pandemia por coronavirus documento # 003/2020 – 21/03/2020.
5. Recomendações gerais para organização dos serviços de saúde e preparo da equipe de enfermagem - Versão1 – COREN.
6. Minimally invasive surgery and the novel coronavirus outbreak - lessons learned in China and Italy.
7. Nota técnica GVIMS/GGTES/ANVISA No 05/2020 - orientações para a prevenção e o controle de infecções pelo novo coronavírus (SARS-CoV-2) em instituições de longa permanência para idosos (ILPI).

8. The New England Journal of Medicine. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1
9. Journal Pre-Proof. Gastrointestinal Endoscopy. Coronavirus (COVID-19) outbreak: what the department of endoscopy should know.
10. Clinical data on hospital environmental hygiene monitoring and medical staff protection during the coronavirus disease 2019 outbreak.
11. NEWS - Proposed protocol to keep COVID-19 out of hospitals. Cite as: CMAJ 2020 March 9;192:E264-5. doi: 10.1503/cmaj.1095852.
12. COVID-19 Nuove indicazioni e chiarimenti - Ministero della Salute.
13. Manejo de cadáveres en el contexto del nuevo coronavirus (COVID-19).
14. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020
15. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020. Centers for Disease Control and Prevention MMWR.
16. The pharmaceutical Journal. pharmaceutical-journal.com-A survey of disinfectant use in hospital pharmacy aseptic preparation áreas.
17. WHO-2019-nCov-IHR_Ship_outbreak-2020.1-eng.
18. Water, sanitation, hygiene and waste management for the COVID-19 virus Technical brief - 3 March 2020.
19. Resolução RDC/Anvisa no 222, de 28 de março de 2018 (disponível em http://portal.anvisa.gov.br/documents/10181/3427425/RDC_222_2018_.pdf/c5d3081d-b331-4626-8448-c9aa426ec410).

20. <https://cbr.org.br/en/cuidados-especificos-para-servicos-de-ultrassono-grafia-diagnostica-durante-o-surto-de-covid-19/> Acesso: 23/3/2020 20h00
21. SOBECC: Processamento de artigos para terapia ventilatória – 2014.
22. https://egestorab.saude.gov.br/image/?file=20200210_N_EmktCorona-VirusPopV2_9220990263189084795.pdf Acesso 24/03/2020 11h00
23. William G. Lindsley, Stephen B. Martin Jr., Robert E. Thewlis, Khachatur Sarkisian, Julian O. Nwoko, Kenneth R. Mead & John D. Noti (2015) Effects of Ultraviolet Germicidal Irradiation (UVGI) on N95 Respirator Filtration Performance and Structural Integrity, *Journal of Occupational and Environmental Hygiene*, 12:8, 509517, DOI: 10.1080/15459624.2015.1018518
24. Katelyn C. Jelden, Shawn G. Gibbs, Philip W. Smith, Angela L. Hewlett, Peter C. Iwen, Kendra K. Schmid & John J. Lowe (2017) Ultraviolet (UV)-reflective paint with ultraviolet germicidal irradiation (UVGI) improves decontamination of nosocomial bacteria on hospital room surfaces, *Journal of Occupational and Environmental Hygiene*, 14:6, 456460, DOI: 10.1080/15459624.2017.1296231
25. <https://www.nebraskamed.com/sites/default/files/documents/covid-19/n-95-decon-process.pdf>