INFECTION CONTROL IN SURGERY ON COVID-19 PATIENTS AND METHOD OF CLEANING OT, RECOVERY ROOM AND ISOLATION ROOMS AFTER USE FOR AEROSOL GENERATING PROCEDURES

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COVID-19 patients are ideally being isolated in a negative pressure environment; operating theaters (OT) are usually designed to be at positive pressure relative to surrounding air. However, 25 per hour of air exchange rapidly reduces viral load within the operation theatre (OT).

Surgery for COVID-19 patients should be planned in such a way to ensure patient safety, healthcare worker safety and infection prevention reducing aerosol-generating procedures (i.e., airway manipulation, face mask ventilation, open airway suctioning and patient coughing) as far as possible involving minimum necessary staff.

- COVID-19 suspected or confirmed patients should be operated in a designated OT separate from the main OT complex with separate air condition system to reduce the risk of contaminating other OTs and other patients.

- New workflows should be created for activation and use of the designated isolation OT. E.g. coordination of staff, movement of surgical and anaesthetic equipment, infection prevention practices, and decontamination following the procedure.

- Only selected equipment and drugs should be brought into the OT to reduce the number of items that need cleaning or discarding following the surgery. Single use equipment should be selected whenever possible. Ensure that all necessary drugs and equipment have been prepared before the patient is taken to the OT.

- Anaesthetic monitors, laptop computers, and ultrasound machine surfaces should be covered with plastic wrap to decrease the risk of contamination and to facilitate cleaning. If not possible to use polythene and discard appropriately.

- The staff number should be restricted to the minimum necessary for patient safety. The staff should wear adequate PPE according to the risk of COVID-19 infected/ suspected patients.

    - Surgery for patients with COVID-19 confirmed/clinically likely- full PPE kit indicated
        - Gown
        - Boots
        - Visor/goggles
        - Cap
        - Impermeable apron extending beyond upper border of boots
        - N95/ ffP2/ KN95 respirator or equivalent
        - Gloves

    - Surgery for patients with COVID-19 tested negative/clinically unlikely with mode of anaesthesia or surgical procedure likely being an aerosol generating procedure (AGP) - intermediate protection
        - Gown
        - Boots

        - Visor
        - Cap
        - Impermeable apron extending beyond upper border of boots
        - Surgical mask
        - Gloves

    - Surgery for patients with COVID-19 tested negative/clinically unlikely with mode of anaesthesia or surgical procedure unlikely being an AGP- standard protection

        - Gowns
        - Boots
        - Goggles or Visor
        - Impermeable apron which goes beyond the upper border of boots
        - Surgical mask
        - Gloves

- Patient should be transported directly to OT. Preferably use intubating cubicles if available.

- Patient should be given a surgical face mask and should be transported from the isolation unit where he was isolated along a designated route with minimal contact with others.(Refer guideline on transport of patients in the hospital)

- Equipment should be prepared to reduce the need for circuit disconnections—e.g. any circuit extensions should be attached before starting the case. Before induction of anaesthesia, a viral filter should be connected to the patient end of the breathing circuit, and another between the expiratory limb and the anaesthetic machine.

- Pre-oxygenation should be carried out via a well-fitting face mask and rapid sequence induction should be carried out to reduce the need for bag-mask ventilation. If bag-mask ventilation cannot be avoided, small tidal volumes (at low pressure) should be administered.

- Awake intubation techniques should be avoided because both patient coughing and atomized local anaesthetic may lead to aerosolization of the virus.

- A definitive airway with an endotracheal tube is preferred over a supraglottic airway device because it has a better seal. A video-laryngoscope is recommended because a PPE including goggles may hamper vision during direct laryngoscopy.

- Deep anaesthesia and neuromuscular blockade should be achieved before attempting intubation. Ensure full expiration into the face mask before lifting it off the patient's face.

- Intubation should be done by the most experienced anaesthetist and following intubation, the cuff should be inflated and the circuit connected before initiating positive pressure ventilation.

- Surgical team should enter the OTat least after 5 minutes of intubation.

- Closed, in-line tracheal suction should be used instead of open suction. A rigid suction catheter than a soft flexible suction catheter may be used to reduce the chance of contaminating the surroundings.

- Following extubation, the patient should wear a surgical face mask and supplemental oxygen may be administered via nasal prongs underneath the face mask. The patient should recover within the OT itself.

- Regional anaesthesia is preferred over general anaesthesia. If a regional technique is chosen, the patient should wear a surgical face mask at all times. If sedation is administered, supplemental oxygen may be administered via nasal prongs underneath the surgical mask.

Decontamination and disposal of waste

After surgery, the anaesthetic breathing circuit and the canister of soda lime are discarded into infectious waste bin.

- Decontamination should be initiated after 5 minutes of completion of surgery.
- All instruments are sent for decontamination and sterile reprocessing.

- Decontaminate work surfaces of OT, R room or the isolation room with freshly prepared 0.1% hypochlorite and contact time should be at least 10 minutes. Use 70% alcohol to wipe down surfaces where the use of bleach is not suitable, e.g. metal. Surfaces of all medical devices are cleaned with 70% alcohol.

- Equipment should be disinfected according to manufactures instructions with appropriate disinfectants. Most equipment surfaces can be cleaned with 70% alcohol.

Reusable PPE

- Boots- clean with 0.5% hypochlorite and if there is a spill, immediately remove and soak in 1% hypochlorite (contact time is at least 10 minutes).
- Goggles- wash with soap and water or detergents, dry and clean with 70% alcohol.

- Use disposable attire whenever possible and discard. If not, linen and theatre attire should be washed by machine with warm water (at least 710C for 25min) and laundry detergent. If machine washing is not possible soak linen in 0.05% chlorine for approximately 30 minutes in warm water. Finally, rinse with clean water and let linen dry fully in the sunlight. If there is any solid excrement on the linen, such as faeces or vomit, discard them disposing in infections waste bin.

- Mackintosh should be immersed in 1% hypochlorite then wash with soap and water. Hang to dry.

- If there is a spill, immediately remove using a soaking material and apply 1% hypochlorite. (Contact time is at least 10 minutes).

- Floor, walls should be cleaned with 0.1% hypochlorite. The OT can be treated with hydrogen peroxide vaporization if available.

- Cleaning equipment (mops/dust pan etc.) should be cleaned with 0.5% hypochlorite.

- All disposable waste should be autoclaved and incinerated. If incinerator is available within the premises waste could be directly sent for incineration.

- More time is needed for decontamination; hence the turn-around time following surgery is increased according to amount of air exchanges per hour. 100% fresh air with 20 changes per hour is recommended for OTs.

- All staff should shower and change into a clean set of suites. Names of all participating staff members are recorded to facilitate contact tracing.

Reference

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