SASA COVID-19 UPDATE

SASA
SOUTH AFRICAN SOCIETY OF ANAESTHESIOLOGISTS

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Recommendations for Workflow and Anaesthesia for COVID-19 Patients Presenting to the Operating Theatre

This is a living document that will be updated and augmented as more information and resources become available. Visit the SASA COVID-19 Update page for the latest version. Queries and corrections can be sent to covid19@sasaweb.com

Principles: Patients who are known or suspected to have COVID-19 may require emergency or urgent surgical care, which must be performed under anaesthesia in the operating theatre. Intubation, extubation and some other theatre procedures are considered high risk for generation of aerosols, and thus airborne, droplet and contact precautions are required for theatre staff present during these periods. Where possible, regional or local anaesthesia should be used to reduce risks. Ideally, COVID and non-COVID patients should be cohorted to two different operating theatre areas, with independent staff cohorts to reduce risk of transmission.

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Before known COVID-19 patients begin presenting to the hospital	
	All hospitals which perform surgery should make facility-specific plans to manage patients with COVID-19, ideally in a dedicated operating theatre.
	Institute screening of patients coming for surgery in order to detect possible cases, and to allay staff concerns regarding accidental exposure. A screening checklist is available.
	Identify where suspected cases under investigation and known COVID-19 patients will be cared for in wards and intensive care units
	Identify which theatre(s) will be used for COVID cases. Ideally, these should be in close proximity to the COVID wards/ICU, and have good access control, their own recovery area, separate staff rest and ablution facilities, negative airflow, and setting/sterilisation areas not shared with the rest of the hospital or other operating theatres.
	Identification of a separate theatre to be used for non-COVID procedures which carry very high risk of infection to practitioners should the patient be an undetected/asymptomatic case (such as endoscopic sinus surgery, bronchoscopy, tracheal interventional procedures, etc) may be appropriate, and allow teams to perform these procedures with enhanced PPE.
Before sending for a case	
	Inform the Theatre Nursing and Medical Managers of the need to use the theatre for a confirmed COVID-19 case. Nursing staff can then prepare according to the normal workflow for contact, droplet and airborne precautions. (Airborne precautions are only required in the specific operating theatre where aerosol-generating procedures will be performed).
	Nursing staff should help ensure the activation of negative-pressure ventilation, securing any access doors and posting of warning signs on all access doors, patient bed and equipment associated with the patient.
	Push out all unnecessary equipment and carts of disposables in order to avoid contamination. Store in an easily accessible area outside or near to theatre. Wherever possible keep the patient bed and any equipment in the theatre itself during surgery to minimise exposure in theatre corridors.
	The ideal team size for a COVID-19 induction and intubation is five people, with three in the “hot” zone in theatre and two “not-hot” outside: Anaesthesiologist and assistant to manage the airway, a second anaesthesiologist or other clinician to give drugs and observe the monitoring, one person to remain in standard PPE at the door to pass equipment into the room, and a runner not in PPE to fetch additional supplies and manage outside communications. Ideally, the outside team members

	can also supervise donning and doffing of PPE, manage telephone calls for the 'hot' clinicians, and prevent unwary staff from entering the theatre.
Preparing anaesthetic and theatre equipment	
	Whilst Not-hot, Anaesthesiologist and assistant(s) should work together to prepare all necessary airway equipment, drugs, infusion devices and monitoring equipment to be used in theatre on an easily-cleanable "COVID Cart". This cart will be wheeled into theatre. Only the disposables needed for the case should be included, as unused disposables will be discarded. Further supplies can be available immediately outside the theatre. (For a good strategy, see the separate Airway Recommendations document).
	Ensure additional bacterial viral filter (BVF) is placed at the expiratory limb of the circuit as well as at the patient Y-connector.
	Check that a closed suction device, disposable tourniquets, adequate gloves and consumables are available, but keep unnecessary supplies outside of theatre.
	Aim to avoid the need to fetch equipment from outside once the patient arrives; spares or alternate sizes should be on a second easily cleanable trolley immediately outside the theatre.
Sending for the case	
	Once the theatre is ready and the scrub nurse has confirmed that (s)he is prepared, the anaesthesiologist should give clear instruction for the patient to be fetched. Porters should use standard contact and droplet PPE and the patient should be wearing a surgical mask.
	Ideally, additional porters should clear a pathway for the arrival of the COVID-19 case.
Donning PPE	
	Staff who are going to be working inside the theatre must hand over all personal belongings, including cell phones, watches, rings, pens, ID badges etc to the PPE buddy or a colleague for safe-keeping to avoid them becoming fomites. See through sealable plastic bags labelled with staff names are advised.

	Staff who will be present for intubation should don the recommended PPE for aerosol-generating procedures in a confirmed COVID-19 case
	A checklist should be used by the PPE Buddy and/or runner who will remain outside theatre.
Receiving the case	
	The patient should be taken directly into theatre, with handover between ward nurse and theatre nurse occurring outside the doors.
Patient notes and personal items	
	Patient notes should be placed outside the theatre where they are accessible to the runner.
	No personal items must be brought into the theatre
	Phones for clinicians on call should be given to a colleague who can take calls and/or redirect them to the landline in the theatre
	An option to facilitate note taking would be keeping a paper anaesthetic record in the operating theatre, and then photographing these notes with a dedicated smartphone kept on the anaesthesia machine, to be sent and printed remotely from the theatre. Paper notes can be kept on file in the theatre until after then pandemic, should they ever be required for medicolegal purposes.
Suggestions for general anaesthesia to minimize environmental contamination	
	Anaesthetists should communicate the anaesthetic and airway plans clearly to the whole team to ensure clear task allocation and that the surgical team is aware of risks (eg. intubation).

	Minimize personnel in theatre during intubation and extubation, and if there are other aerosol-generating procedures (AGPs) such as bronchoscopy or tracheostomy planned.
	Use a dedicated high-acuity COVID airway plan with a dedicated team where available. Refer to the SASA COVID airway recommendations for guidance.
	## Induction Follow the airway guidelines above. In brief: ● Pre-load a closed suction device onto the anaesthetic circuit. Follow the pattern: Circuit > Y-connector > Pitot/flow devices > Viral/Bacterial Filter > (Catheter mount if needed) > Closed suction system > Mask (later ETT) ● The capnography sample line should be connected to the filter or circuit-side ● Preoxygenate with two-handed mask seal to minimise risk of aerosolization ● Delegate drug injection to second anaesthetist ● Allow time for optimal preoxygenation to prolong tolerable apnoeic duration ● Perform (modified) RSI to avoid bag mask ventilation ● Allow time for full onset of muscle relaxant to avoid coughing. Suxamethonium may be warranted in patients with respiratory compromise to shorten apnoeic time ● Intubate using approach to maximise first-pass success and limit clinician exposure. The use of a Video Laryngoscope (with integrated display) and preloaded introducer on the first attempt is advised. ● BEFORE turning on the ventilator, make sure that the cuff is inflated, the closed suction device is connected in the system, and the connections are all secure.
	When first intubation attempt is unsuccessful: ● Call for help early. A second attempt may be warranted if there is an immediately correctable issue and the patient's saturations are still acceptable, else ● **Plan B:** Call for the Airway Rescue Bag and immediately place a second-generation supraglottic airway (eg. i-gel, AuraGain or LMA Protector) ● **Plan C:** Two-handed mask ventilation, with assistant squeezing the bag. Avoid using excessive flow or positive pressures during the process to minimize leak. ● **Plan D:** Front-of-neck access using scalpel-bougie-tube technique. ALWAYS put the ventilator on STANDBY before any circuit disconnection.
	## During the case ● Make certain that the circuits and connections are snug to avoid unplanned circuit disconnections ● Remember to put the ventilator on standby before disconnecting ● Maintain good neuromuscular blockade ● Monitor depth of anaesthesia if possible ● Runner to be directed to fetch additional items such as warmed IV fluids, etc

	### Extubation ● Consider prophylactic antiemetics before reversal ● Extubate on table to minimize risk of circuit disconnection ● Use plastic sheet over the patient's head to reduce droplet and aerosol dispersion during extubation has been proposed, but remains unproven ● Immediately after extubation, apply the anaesthesia mask snugly until patient stable ● Place a surgical mask on the patient when adequately awake ● Use low-flow supplemental O2 by mask or nasal cannula under facemask if needed If switching ventilators for transport: ● Remember to put ventilator in STANDBY mode before circuit disconnection ● Disconnect circuit from bacterial filter so that filter and and closed suction device remain connected to the ETT
## Changing PPE if needed	
	Full AGP PPE should be kept on throughout the entire case, in case of circuit disconnection or emergency, and to avoid the use of more PPE when extubation is required.
	If soiled PPE needs to be changed, staff should remove PPE according to the doffing guidelines, exit the theatre to perform hand hygiene and put on new PPE outside the room before re-entering.
## Bringing in extra equipment from outside	
	A runner should remain outside the theatre to coordinate communications and fetching of extra items. Equipment can be placed onto an easily cleanable trolley and pushed into the theatre
## Doffing PPE	
	Proper removal of PPE is crucial - follow the available guidance. An animated instruction video for donning and doffing will be available soon.

	Overshoes (if worn) > Gown with outer gloves > Hand hygiene > Eye protection > Hand Hygiene > N95 > Cap > Gloves > Hand hygiene
Postoperative Care	
	Patients not requiring special postoperative care should be recovered in the operating theatre or a closed recovery area dedicated to COVID-19 patients.
	The awake patient should be recovered and transported wearing a surgical mask.
	If the patient is to be escorted to other areas, the escort team should be in normal contact and droplet precaution PPE during the escort.
	If the patient is to be transferred ventilated to intensive care, the team should keep (at minimum) their N95 masks and eye protection in place, but consider performing the transfer in full AGP PPE. Ventilator disconnects should be minimised.
	If escort is not needed, once the patient has recovered, the staff should remove PPE one by one with their PPE buddy in keeping with the PPE guidelines.
Decontamination of equipment and theatre	
	Double bag all used and unused disposables in the theatre in red bags to be discarded.
	Equipment that can be safely submerged can be placed in a container of enzymatic detergent (eg. Endozyme) and soaked for the recommended period before sterilisation.
	All other equipment must be wiped down with surface disinfectant (eg. >70% alcohol or a hypochlorite solution) and allowed to dry.
	In resource-limited settings, an adequate cleaning solution can be made with the WHO recommendations. Using any commercially available bleach solution of 3 to 3.5 %, dilute 25 ml of bleach up to 750 ml in water in a spray bottle.

	Anaesthesia circuits and filters should be bagged for disposal. The workstations, monitoring equipment and other non-disposable items must be cleaned with surface disinfectant. Instructions from major manufacturer on terminal disinfection of their workstations are available here: ● GE Cleaning instructions for Advanced Breathing Systems ● GE Detailed cleaning and sterilisation guide ● GE compatible cleaning agents
	Air theatre for at least 20 minutes after the patient leaves theatre.
	Theatre and other items can then be cleaned according to standard droplet and contact protocols.

SASA wish to acknowledge the Prince of Wales Hospital, Hong Kong, for the original document from which this recommendation was modified.