



National Anaesthesia Guideline for COVID 19 Pandemic Time

6 August, 2020



**Directorate General of Health Services
Ministry of Health and Family Welfare
Government of the People's Republic of Bangladesh**



Chief Adviser: Professor Dr. Abul Bashar Mohammad Khurshid Alam, Director General, Directorate General of Health Services (DGHS)

Adviser: Professor Dr Shahnila Ferdousi, Director, Disease Control and LD, CDC, Directorate General of Health Services (DGHS)

Chief Editor: Prof Dr Debabrata Banik, President, Bangladesh Society of Anaesthesiologists

Executive Editor: Prof Dr Kawsar Sardar, Secretary General, Bangladesh Society of Anaesthesiologists

Assistant Editor: Dr Aninda Rahman, DPM (ARC, Hepatitis), CDC, Directorate General of Health Services (DGHS)

Editorial Board:

Prof M Khalilur Rahman, Senior Consultant(Hon), Department of Anaesthesiology, Surgical ICU and Pain Medicine, BIRDEM General Hospital

Dr Rokeya Sultana, Senior Anaesthesiologists

Prof U.H. Shahera Khatun, Ex-HOD, Anaesthesiology, Critical Care & Pain Medicine, Dhaka Medical College

Prof ABM Muksudul Alam, Principal & HOD, Anaesthesiology, Critical Care and Pain Medicine, Shahid Suhrawardi Medical College

Prof AKM Nurnobi Chowdhury, Department of Anaesthesiology, Surgical ICU and Pain Medicine, BIRDEM General Hospital

Dr. Md. Abdul Hye, Professor, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Prof Abdur Rahman, Anaesthesiology, Critical Care & Pain Medicine, Bangladesh Medical College

Dr Mohammed Sharif, Anaesthesiologists and Director (MCH), Directorate General of Family Planning

Dr Md Amir Hossain Rahat, Anaesthesiologists and Director, Human Resource Management, Directorate General of Medical Education

Prof Md Mozaffer Hossain, HOD, Anaesthesiology, Critical Care & Pain Medicine, Dhaka Medical College

List of Contributors:

Prof Dr. Debasish Banik, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Prof Dr. AK Qumrul Huda, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Dr. Iqbal Hossain Chowdhury, Assoc Prof, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Dr. Md. Mostofa Kamal, Assoc Prof, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Dr. Sabina Yesmeen, Assoc Prof, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Dr. Montosh Kumar Mondal, Asso Prof, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Dr. AKM Faizul Haque, Assoc Prof, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Prof Dr Md Abdul Kader, HOD, Department of Anaesthesia, Critical Care and Pain Medicine, Shahid Tajuddin Ahmad Medical College

Dr. Nibedita Nargis, Associate Professor and Incharge of NICU, PICU & Adult ICU, Japan East West Medical College Hospital

Prof Dr Manash Kumar Basu, HOD, Anaesthesiology, Critical Care and Pain Medicine, NICRH

Prof Parash Chandra Sarker, HOD, Anaesthesiology, Critical Care and Pain Medicine, Delta Medical College

Dr Sarwar Jahan, Consultant, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Dr AKM Habibullah, Consultant, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Dr Mehedi Hasan, Consultant, Department of Anaesthesia, Analgesia and Intensive Care Unit, BSMMU

Prof. M A Salam Khan, Professor, Department of Anaesthesiology, Surgical ICU and Pain Medicine, BIRDEM General Hospital

Dr Md Shafiul Alam Shaheen , Assist. Professor, Anaesthesiology, Surgical ICU and Pain Medicine, BIRDEM General Hospital

Prof. Dr. Dilip Kumar Saha, HOD, Department of Anaesthesiology, Critical Care and Pain Medicine, Sir Salimullah Medical College

Dr. Md. Tajul Islam, Assist. Prof, Department of Anaesthesiology, Critical Care and Pain Medicine, Sir Salimullah Medical College

Dr. Syed Ariful Islam, Assist. Prof, Department of Anaesthesiology, Critical Care and Pain Medicine, Sir Salimullah Medical College

Dr. Shahidul Islam, Asst. Prof, Department of Anaesthesiology, Critical Care and Pain Medicine, Shahid Suhrawardi Medical Medical College

Dr Atiqul Islam, Associate Professor & Head, Department of Anaesthesiology, Critical Care and Pain Medicine, Sheikh Hasina Burn and Plastic Surgery Institute

Prof. Dr. Ranjan Kumar Nath, Department of Anaesthesiology, Critical Care and Pain Medicine, Chittagong Medical College

Dr. Md. Atower Rahman, Associate Professor & Head, Department of Anaesthesiology, Critical Care and Pain Medicine, Comilla Medical College

Dr Nitai Chandra Sarkar, Associate Professor, Department of Anaesthesiology, Critical Care and Pain Medicine, Shahid Ziaur Rahman Medical College

Dr Mostafa Kabir, Assistant Professor, Department of Anaesthesiology, Critical Care and Pain Medicine, Shahid Ziaur Rahman Medical College

Dr A N Khairul Bashar, Assistant Professor, Department of Anaesthesiology, Critical Care and Pain Medicine, Shahid Ziaur Rahman Medical College

Prof Dr Sheikh Md Abu Taher, HOD, Anaesthesia, Department of Anaesthesiology, Critical Care and Pain Medicine, Rajshahi Medical College

Dr. Md. Habibur Rahman, Associate Professor, Department of Anaesthesiology, Critical Care and Pain Medicine, Khulna Medical College

Dr. Sk. Farid Uddin Ahmed, Associate Professor, Department of Anaesthesiology, Critical Care and Pain Medicine, Khulna Medical College

Dr Md Shafiqul Islam, Associate Professor and HOD, Anaesthesiology, Critical Care and Pain Medicine, Sher-E-Bangla Medical College

Dr Nazmul Ahsan, Assist Prof, Department of Anaesthesiology, Critical Care and Pain Medicine, Sher-E-Bangla Medical College

Prof. Dr. Sabya Sachi Roy, HOD, Anaesthesiology, Critical Care and Pain Medicine, Parkview Medical College, Sylhet

Prof Dr Md Sayedur Rahman, HOD, Anaesthesiology, Critical Care and Pain Medicine, Rangpur Community Medical College

Dr. Mohammad Moinul Islam, Assistant Professor and Head, Department of Anaesthesiology, Critical Care and Pain Medicine, Sylhet MAG Osmani Medical College

Dr Shahjad Hossain, Assist Prof, Department of Anaesthesiology, Critical Care and Pain Medicine, Kurmitola General Hospital

Prof. Dr. Refat Hossain Malik, Department of Anaesthesiology, Critical Care and Pain Medicine, Delta Medical College

Dr Md Ahsanul Kabir, Department of Anaesthesia, Assist Prof, Kurmitola General Hospital

Dr Muhammad Asaduzzaman, Assist Prof, ICU In Charge, Kuwait Bangladesh Friendship Hospital

Dr Anisur Rahman, Department of Anaesthesia, Critical Care and Pain Medicine,
Mugda Medical College

Dr Niaz Ahmed, Senior Consultant and Co-ordinator, Cardio-thoracic Anaesthesia
and ICU, Evercare Hospital, Dhaka

Dr Md Quamrul Islam, Consultant, Anaesthesiology, Square Hospitals Ltd

Dr ANM Badruddoza, Senior Consultant, Department of Anaesthesia, Evercare
Hospital, Dhaka

Dr ABM Kamrul Hasan, Anaesthetist, RIPAS Hospital, Brunei Darussalam

Preface

Anaesthesia is an integral part of surgical care in any health care system. These activities always going on in a coordinated and rhythmic way. Arriving of new notorious deadly COVID 19 virus hampered this rhythmic activity very seriously. The acuity, skill sets, resources and supply chains that support such services is essential for responding to this impending crisis. Operating theatres are potentially high exposure zones given manipulation of the airway and aerosolization of respiratory particles, with anaesthesia providers at particularly high risk. It comes with the additional risk inherent in the presence of multiple staff members –anaesthesia providers, surgeons, nurses, and cleaners – who are all involved in managing perioperative processes. Anaesthesiologists are also frequently responsible for managing intensive care units and pain clinics. Thus, the exposure, and subsequent nosocomial and community transmission potential, is an extraordinary risk. Continuation of operational services is a big challenge for the health care worker in this pandemic situation. Worldwide, the protocol for anaesthesia and surgical and obstetric activities have been changed in this pandemic situation targeting on maximum safety for health care worker with patients as well. The surgical and Obstetric services disrupted in Bangladesh like other part of the world. As the pandemic is continuing, it is essential to make guideline to continue the service in an articulated and rhythmic way by focusing on patients and health care worker safety. I am very thankful to Bangladesh Society of Anaesthesiologists for their effort on publishing very time demanding Anaesthesia guideline for surgery and obstetric services. I think this guideline will help us to continue the surgical and obstetric services in Bangladesh.

Chief Adviser

Professor Dr. Abul Bashar Mohammad Khurshid Alam
Director General, Directorate General of Health Services (DGHS)

Contents

SL	Chapter	Page
1	Executive Summary	9-10
2	Introduction	11
3	World Strategy for Anaesthesia in COVID 19 Crisis Time	11
4	Personal Protective Equipment (PPE)	12
5	Pre- Anaesthetic Check Up	12-13
6	Preoperative Investigations for Suspected or COVID Positive Patients	13-14
7	Preoperative Investigations for Non-COVID Patients	14
8	Operating Room Environment in COVID Crisis Time	14-15
9	Anaesthetic Consideration for COVID 19 Patients	15-18
10	Use of HEPA Filter in Breathing Circuit is Advocated	18
11	Surgery for ICU Patients	18
12	Instructions to Other OT Staffs During Intraoperative Period	18-19
13	Instructions for Laparoscopic Procedures	19
14	Anaesthetic Consideration for Obstetric Care in COVID Pandemic	20
15	Postoperative Care	21
16	PPE Doffing/Removal	21
17	Waste disposal	22
18	Management of Staff in the Division of Anaesthesiology	22
19	Departmental Academic Activities in COVID Crisis Time	22-23
20	Testing Recommendation for COVID-19 Patients to Plane for Surgery in the Upcoming Days - Continuing the Service and Suppressing the Pandemic	23-24
21	Acknowledgement	25
22	References	26

List of Abbreviations

AHU- Air Handling Units

BiPAP- Bilevel Positive Airway Pressure

CDC- Centre for Disease Control

COVID- Corona Virus Disease

CPAP- Continuous Positive Airway Pressure

FFP- Filtering Face Piece

HEPA- High Efficiency Particulate Air

HME- Heat and Moisture Exchange

HRCT- High Resonance Commutate Topography

IAP- Intra Arterial Pressure

ICU- Intensive Care Unit

IEDCR- Institute of Epidemiology, Disease Control and Research

LSCS- Lower Segment Caesarean Section

OPD- Out Patient Department

OR- Operation Room

PHEIC- Public Health Emergency of International Concern

PPE- Personnel Protection Equipement

RSI - Rapid sequence induction

RT-PCR- Reverse Transcription Polymerase Chain Reaction

SAB- Subarachnoid Block

SARS- Severe Acute Respiratory Syndrome

WHO- World Health Organization

Executive Summary

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first identified in December 2019 in Wuhan, the capital of China's Hubei province, and has since spread globally, resulting in the ongoing 2019–20 coronavirus pandemic. The World Health Organization (WHO) declared the 2019–20 coronavirus outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 and a pandemic on 11 March 2020. The first three known cases were reported in Bangladesh by Institute of Epidemiology, Disease Control and Research (IEDCR) on 8 March 2020.

The world is currently facing an unprecedented healthcare crisis caused by COVID-19 pandemic. The objective of these guidelines is to produce a framework to facilitate the partial and gradual resumption of surgical and obstetrical activities in the context of the COVID-19 pandemic in Bangladesh.

In this context, majority of surgical and gynae and obstetric departments were forced, both due to reduced manpower/facilities and to limit the viral spread, to re-schedule their activity giving priority to urgent/emergent and non-deferrable oncological cases. The prioritization of patients is a complex strategy that poses several organizational and ethical issues.

A number of organizations have released recommendations and guidelines for addressing the COVID-19 pandemic. When the COVID-19 pandemic began, all international organizations supported recommendations to delay elective surgery. As the pandemic continues to evolve and physicians and healthcare facilities are resuming elective surgery based upon geographic location, all organizations are sharing important clinical considerations to help guide the resumption of clinical care. Bangladesh is no exceptional. Bangladesh Society of Anaesthesiologists along with Centre for Disease Control (CDC) of Bangladesh jointly proposed the “National Anaesthesia Guideline for COVID 19 Pandemic Time” based on highest priority on HCW’s personal safety and protection in terms of spreading infection, patient’s safety and continuing the services in upcoming days near normal. This guideline will guide the Anaesthesiologists the best anaesthetic care in this COVID crisis time.

This guideline will particularly focus on world strategy for anaesthesia in COVID 19 crisis time, personal protective equipment (PPE), pre- anaesthetic checkup room activities, preoperative investigations for suspected or COVID positive patients, operating room environment in COVID crisis time, anaesthetic consideration for COVID 19 patients, use of HEPA filter in breathing circuit, surgery for ICU patients, instructions to other OT staffs during intraoperative period, instructions for laparoscopic procedures, anesthesia for cesarean delivery, postoperative care, PPE doffing/removal, waste disposal, management of staff in the division of Anaesthesiology, departmental academic activities in COVID crisis time and finally testing recommendation for covid-19 patients to plane for surgery in the upcoming days to continue the service. This guideline will help to continue the surgical and obstetric services to the people by minimizing the spread of infection by this notorious virus to the health care worker in the process of surgery and anaesthesia. This guideline will be updated time to time according to situation.

Introduction

Anaesthesiologists and other perioperative care providers are particularly at risk when providing preanesthetic check up, per-operative management, post-operative care and specially tracheal intubation of patients with COVID-19. The Anaesthesiologists also provide their services in other two areas of hospital; Intensive Care Unit and Pain Management OPD. The risk is same when providing the services in Intensive Care Unit as in operation room during anaesthesia in terms of getting infection by notorious COVID 19 viruse. On the other hand, risk is same in Pain management OPD as in preanesthetic check up room. Bangladesh Society of Anaesthesiologists would like to draw anaesthesia team attention to the importance of appropriate precautions when providing the services for their patients. This guideline will guide the Anaesthesiologists the best anaesthetic care in this COVID crisis time for surgical and obstetric care, special focus on personal protection, preanesthetic care, preanesthetic investigations, per-operative care, operation theatre environment, post-operative care, manpower utilisation, departmental academic activities and many things.

World Strategy for Anaesthesia in COVID 19 Crisis Time

All leading organisations, Health authorities and Societies recommended only emergency surgical interventions in this pandemic situation. All routine operations and procedures are discouraged to reduce spreading of infection by this notorious devastating virus. All health authorities of the world are continuously focusing on personal protection of health care worker as first priority in this pandemic time. To prepare for a pandemic, hospitals need a strategy to manage their space, staff, and supplies so that optimum care is provided to patients. In addition, infection prevention measures need to be implemented to reduce in-hospital transmission. In the operating room, these preparations involve multiple stakeholders and can present a significant challenge.

Personal Protective Equipment (PPE)

A comprehensive program for the use of PPE is mandatory to protect yourself in this COVID situation and upcoming days. All anaesthesia and operation theatre staffs should be well trained in DONNING and DOFFING. They should be taught how to clean, disinfect, store, and inspect their PPE for any damage. Fit test or smell test for individual mask is to be ensured to pick up perfect mask for individual.

Necessary Personal Protection Equipment:

- N95/FFP2 facial mask or equivalent
- N100/FFP3 facial mask (If available)(In case of manoeuvres at high risk of generating aerosolised particles)
- Disposable long sleeve waterproof coats, gowns
- Disposable double pair of nitrile gloves
- Protective goggles or visors
- Disposable head caps
- Disposable long shoe covers
- Face shield
- Alcoholic hand hygiene solution

Pre- Anaesthetic Check Up

- At least good quality face mask and face shield is advocated to perform pre-anaesthetic check up for all patients in the pre-anaesthetic check up room/ pain clinic. Every patient entering the pre-anaesthetic check up room/ pain clinic should be considered as COVID-19 positive in this pandemic situation.
- The Anaesthesiologists should use gloves to handle the patients and record sheet. Hand washing with alcohol based sanitiser or soap and water in between the patients is advocated.
- Minimum physical examination and optimum distancing is advocated during pre-anaesthetic check up and pain OPD
- Restrict the number of attendants coming with patients. Only one attendant to be allowed with the patient and attendant should stay outside the room.
- Manage inflow of patients and prevent crowding inside the pre-anaesthetic check up room and Pain Clinics.

- Mask is mandatory for both patient and attendant.
- History of fever should be elicited/record patients' body temperature before entering the pre-anaesthetic check up room/Pain Clinic. If the body temperature is higher than 98.6°F, patient should be asked to restrict him/herself at home and report to flu clinics in case of worsening of symptoms. All patients with cough should be immediately provided with a surgical mask at the reception and they should not be made to wait in queues.
- Record if any family member became COVID positive within last two weeks.
- Ask specifically about international travel or domestic travel in the affected areas in last fortnight by the patient or his family members.
- All reusable equipment stethoscopes, BP instruments etc., should be frequently sanitised.
- At the end of the day, clean and disinfect pre-anaesthetic check up room and Pain clinics by thoroughly wiping the surfaces of furniture, equipment and floor with 2 to 3% hydrogen peroxide.
- After returning from hospital, take bath before greeting family members. Change the clothes and keep them in wash bucket.
- Institutes should counsel patients actively to reschedule elective/semi-emergency surgical procedures. This is especially for the elderly, paediatric and immuno-compromised patients.
- Defer interventional chronic pain procedures. Only emergency procedures to be done.

Preoperative Investigations for Suspected or COVID Positive Patients

Patients having fever, cough, breathlessness, throat pain, bodyache and lose of smell is to considered as suspected COVID. The following investigation is suggested in emergency operation:

- Complete blood count
- ESR
- CRP
- Serum feritine level

- D-Dimer
- Pro-calcitonin level to exclude bacterial infection
- X-Ray chest P/A view
- HRCT of chest
- RT-PCR for all emergency surgical patients if time permitted. But do it mandatorily for all elective cases.

Preoperative Investigations for Non-COVID Patients

- Routine Preoperative investigations as protocol
- RT-PCR for all elective cases proposed within 24 hours of surgery

Operating Room Environment in COVID Crisis Time

- A small separate OR complex should be designated for surgery in patients suspected or confirmed to have COVID-19 to reduce the risk of contamination of other ORs and other patients.
- Designated areas were prepared for donning and doffing of PPE. Steps were numbered in sequence and posters were put up to guide staff.
- An OR with a negative pressure environment is ideal to reduce dissemination of the virus beyond the OR.
- A standard OR is usually designed to be at positive pressure relative to surrounding air.
- Nevertheless, a high frequency of air changes (25 per hr) rapidly reduces viral load within the OR.
- Air-condition system recirculates the virus inside the room. Off mode of AC help to settle down and fix the virus.
- Non-COVID-19 patients are to be relocated to the main OR complex.
- Each OR has to its own ventilation system with an integrated high-efficiency particulate air (HEPA) filter.
- Traffic and flow of contaminated air is to be minimised by locking all doors to the OR during surgery, with only one possible route for entry/exit via the scrub room.

- More time is needed to prepare for surgery in a suspected/confirmed case of COVID-19, daily routines were set up regardless of whether surgery would happen. These included routine checks and cleaning of anaesthetic machines and powered air-purifying respirator sets.
- Equipment kept in each OR must be minimised to what is strictly necessary on a case to case basis.
- Once the operation starts, all efforts must be made to use what is available in the room and minimise staff transiting in and out the OR, in order to minimise infection risk.
- Standard anaesthetic trolleys should be replaced with dedicated pre-prepared ones with minimal but adequate stock.
- All required surgical material (i.e., stitches, scalpel blades) must be preemptively prepared in a sterilisable steel wire basket.
- Dedicated containers must be used for infected and sharp disposable instruments.
- Alcoholic solution for hand hygiene must always be available.
- Avoiding non-strictly necessary commonly used non-disposable devices is recommended.
- Disposable material in general should be preferred, including linen.
- All operators (i.e., surgeon, anaesthetist, nurses, technicians) should enter the OR timely, aiming to minimize time spent within the OR itself.
- Once in the OR, they should not leave until the operation is completed, and once out they should not re-enter.

Anaesthetic Consideration for COVID 19 Patients

- Careful anaesthetic planning is recommended to minimise any infection potentially associated with unexpected complex endotracheal intubation procedures.
- Prefer regional anaesthesia, where ever possible. A surgical mask or N95 mask must be applied to the patient throughout the length of stay in the operating

room. In case supplementary oxygen is needed, the oxygen mask is applied over the surgical mask or N95 mask.

- For general anaesthesia, pre-oxygenate for five minutes with 100% oxygen. Avoid high flow oxygen to prevent aerosolization. Ask the patient not to cough. It is prudent to cover the patient's nose and mouth with two layers of wet gauze to block some of the secretions.
- A more liberal use of intubation might be justified in patients with acute respiratory failure, bypassing non-invasive ventilation techniques (e.g., CPAP or BiPAP) in order to minimise the transmission risks.
- Disposable airway equipment should be preferred.
- Medical and nursing staff must be equipped with N95/N100/FFP2/FFP3 or equivalent during laryngoscopy and intubation.
- Intubations techniques with the highest chance of first-time success should be preferred to avoid repeated airway instrumentation. So tracheal intubation should be done by experienced anaesthesiologists. Limit the number of anaesthesia team personnel (maximum three) inside the OT. Second clinician with PPE can be available outside the OT for immediate assistance.
- Rapid sequence induction (RSI) and tracheal intubation (with cricoid pressure) to be done in the first attempt. Ensure adequate neuromuscular blockade to avoid bucking that can increase aerosolization. Immediately inflate the tracheal tube cuff before starting ventilation.
- The choice of induction drugs is dictated by haemodynamic considerations. Midazolam with etomidate or propofol, depending upon patient's haemodynamic condition, can be used for induction. Fentanyl is recommended for analgesia. If no contraindications are present, succinylcholine 1 mg/kg should be administered for tracheal intubation.
- If manual ventilation is required, small tidal volumes should be used.
- Re-sheath the laryngoscope blade immediately post intubation with the outer glove worn by the operator.
- Supraglottic airway devices should be used only in 'cannot ventilate' situations. This will avoid manual bagging and provide rescue oxygenation.
- Awake intubation techniques should be avoided.

- Video-laryngoscope (if available) can be used to improve intubation success. Also, it may increase the distance between the patient's airway and that of the anaesthesiologist who performs the intubation.
- At the end of these procedures, all staff directly performing the procedure must immediately replace the first pair of gloves and other PPEs in case heavy contamination risk exists (i.e., in the event that vomiting, coughing, or else has occurred).
- Fibrescope intubation, unless specifically indicated, should be avoided as it may generate aerosolization.
- If available, a closed suction system should be preferred during airway aspiration.
- Use low gas flows and closed circuits. Limit the ventilatory disconnections and, if needed, do at end expiratory phase.
- Prophylactic administration of anti-emetic drug is preferred to reduce the risk of vomiting and viral spread.
- Tracheal extubation should be done on table, as far as possible. After tracheal extubation, patient to be transferred to the isolation ward. If tracheal extubation is not feasible, then shift the patient to designated Intensive Care Unit (ICU).
- During transfer, the team should wear proper PPE outside the operating room. The patient should be covered with one disposable operating sheet and then transferred through a dedicated lobby and elevator.
- The patient must wear a surgical mask or N95 mask during transfer. The surfaces of passage ways and the elevator should be cleaned. If the patient is kept intubated, a single-patient-use Ambu bag with HME filter attached must be used during transfer. Do not use a ventilator during transfer.
- Discard breathing circuit, mask, tracheal tube, HME filters, gas sampling line and soda lime after every patient. Water trap to be changed if it becomes potentially contaminated.
- Seal all used airway equipment in a double zip-locked plastic bag. It must then be removed for decontamination and disinfection.
- After removing protective equipment, avoid touching your hair or face before washing hands.

- A minimum of one hour is planned between cases to allow OT staff to send the patient back to the ward, conduct thorough decontamination of all surfaces, screens, keyboard, cables, monitors and anaesthesia machine with 2 to 3% hydrogen peroxide spray disinfection, 2-5 g/l chlorine disinfectant, or 75% alcohol wiping of solid surfaces of the equipment and floor. The hydrogen peroxide vaporiser is an added precaution to decontaminate the OT.
- All unused items on the drug tray and airway trolley should be assumed to be contaminated and discarded. All staff has to take shower before resuming their regular duties.
- Disposable covers should be used whenever possible to reduce equipment contamination.
- The time patients spend returning to wards must be reduced in order to minimize contact between COVID-positive patients and the surrounding environment.
- After end of activities, all involved personnel, whenever possible, should shower.

Use of HEPA Filter in Breathing Circuit is Advocated

- When a general anaesthetic is required, a HEPA (high-efficiency particulate air) filter should be connected to the patient end of the breathing circuit and another one between the expiratory limb and the anaesthetic machine.
- Alternatively, for paediatric patients or other patients in whom additional dead space or the weight of the filter may be problematic, the HEPA filter must be placed at the expiratory end of the circuit (before the exhalation re-enters the ventilator).
- The gas sampling tube must also be protected by a HEPA filter.
- Both HEPA filters and soda lime must be changed after each case.

Surgery for ICU Patients

- If a patient is transferred directly from the intensive care unit, a dedicated transport ventilator should be utilised.
- In order to reduce aerosolization risks, the gas flow should be turned off and the endotracheal tube clamped with forceps when switching from the portable device to the OR ventilator.

- When possible, a dedicated ventilator should be used in the OR for general anaesthesia in positive or suspected positive COVID-19 patients.

Instructions to Other OT Staffs During Intraoperative Period

- The OR door must be kept closed at all times and clear signs should discourage unnecessarily entering the room.
- Supplying materials to the OR during surgery should also be discouraged.
- The scout nurse, in collaboration with the operating surgeon, should anticipate what is needed during the operation before the same starts. Surgeons should preferably perform the operation with what is available in the OR once the operation started.
- Any essential retrieval of necessary equipment should be done by staff outside the OR.
- Personnel present in the OR during surgery must not leave the room. Electromedical devices (i.e., ultrasound) and surfaces must be used with adequate protective cover and adequately sanitised at the end of the operation.
- The surgical team will drape the patient according to the surgical procedure, replacing the surgical mask with N95/FFP2 filter and wearing long shoe covers before doing so.
- All personnel in direct contact with the patient must wear a double pair of gloves at all times, even while operating.
- After the patient left the OR, logistics should allow as much time as possible before the next procedure takes place, to reduce possible air contamination.
- This time depends on the number of air exchanges/hour of the specific room. Air exchange cycles should be increased whenever possible to ≥ 25 exchanges/h.
- After the case, all areas at risk of contamination must be cleaned and disinfected.
- Efforts should be made to minimize the contamination risk associated with specimens sent to the pathology department.
- No data currently exist on COVID-19 viral load in bodily fluids or tissue samples.

Instructions for Laparoscopic Procedures

Laparoscopic procedure is the highest aerosol generating procedure among all surgical procedures. If you want to go for anaesthesia in laparoscopic surgery, you should take all special precaution to minimise the spread and guide the surgeon according to following instructions to minimise the spread:

- Use of hepafilter in cannula
- Close suction with hepafilter
- Minimum burn
- Special precaution about gas leak
- Suction of all gases before evacuation of specimen
- Use low IAP (< 10 mmHg)

Anaesthetic Consideration for Obstetric Care in COVID Pandemic

Every institution should have a referral centre for high-risk obstetrics and while an earmarked COVID hospital was being setup, a stand-alone COVID-maternity facility should be created in the main hospital in case a COVID suspect or positive mother arrived and required immediate care.

The separate facility consisted of a Labour room, OR and recovery area with adequate space for donning and doffing of PPE by the health care workers. The air handling units (AHU) and central air conditioning had to be turned off and exhaust fans fixed in the isolated area. Ideally, the facility for negative pressure venting of air should be available to prevent virus dissemination.

An elective LSCS is to be considered as safest option for this patient, as induction of labour and vaginal delivery would require prolong time, personnel and PPE. There are also concerns of excessive aerosol production due to hyperventilation during labour.

In addition, an elective procedure would avoid an emergency LSCS and need for general anaesthesia and tracheal intubation. In case needed, tracheal intubation should be done as an elective rather than emergency procedure to increase first-pass success and minimize aerosol generation. Another reason for LSCS is the emerging evidence of vertical transmission during vaginal delivery. Many Societies

of Obstetric Anaesthesia and Perinatology has recommended avoidance of emergency deliveries in COVID-19 parturients as much as possible.

The pre-anaesthetic assessment is to be done once the patient received in the COVID area as there is need to preserve PPEs.

Recent papers have described the safety of central neuraxial blocks for COVID-positive obstetric patients requiring caesarean section. One paper describes the use of SAB whereas another describes use of epidural or general anaesthesia for these parturients.

We recommend SAB to decrease chances of aerosolization during preoxygenation, facemask ventilation, endotracheal intubation, oral or tracheal suctioning and extubation. Diminished visibility due to fogging, triple layers of gloves (sterile gloves over the 2 pairs that were a part of PPE) may have hindered tactile perception leading to failed attempts and dry tap with the 25G spinal needle. A 23G needle may have helped in better assessing dural puncture. We did not observe excessive hypotension as reported in a case series in parturients receiving continuous epidural anaesthesia for LSCS.

Postoperative Care

- Appropriate PPE should be worn by health care provider in postoperative ward.
- After recovery, patients can be transferred to COVID designated ward or cabin if recovery score is at satisfactory level or safe for transfer.
- Recovery phase after surgery must be done in OR, before transfer the ward/cabin/ICU.
- Postoperative area should be designated for COVID patients separately and mark as restricted zone.
- Routine postoperative visits should be limited and replaced by phone calls where applicable to reduce movement of staff around the hospital.
- N95 (preferably) or surgical mask should be used for every patients keeping over by oxygen mask.
- Appropriate monitoring should be ensured specially vomiting and SPO2.

PPE Doffing/Removal

- Staff involved in the patient's care should leave the OR at the end of the operation and remove all PPEs in a dedicated doffing area following the standard sequence.
- A clean area should be accessed only after the doffing procedure is complete.
- All used PPEs must be disposed of through specific containers.
- Scrubs must be replaced after each procedure following showering, whenever possible.
- Personnel responsible for transferring the patient away from the operating room must follow separate access routes and wear PPEs different from the ones worn in the OR.

Waste disposal

- It is advisable to set up a dedicated container for hazardous medical waste immediately outside the OR, to immediately dispose of all contaminated disposable material and PPEs.
- Containers should be closed and sealed before being transferred to the collection point.
- All sharps should be disposed of in a dedicated rigid plastic container.
- PPE should be worn when closing and transporting containers and removed immediately after.
- Any visibly damaged or contaminated container must be promptly replaced.

Management of Staff in the Division of Anaesthesiology

- Every anaesthesiologists should have well training in personal protection.
- Every anaesthesiologists should have adequate knowledge about modern OT environment regarding infection control.
- Every anaesthesiologists should have clear idea about breathing circuit management to lessen exposure.
- Every anaesthesiologists should be prepared themselves for regional anaesthesia for all over body to keep them ahead from aerosol generating site.

- Use of nerve stimulator and ultrasound to increase the success of regional block is advocated.
- Changes in duty roster- keeping in mind to ensure best possible way for less exposure time.
- Anaesthesiologists with old age and co-morbid condition are to be considered to place in non COVID area.
- Pregnancy and early postpartum period discouraged for COVID area.

Departmental Academic Activities in COVID Crisis Time

- Continuous medical education on COVID update and training programme on personal protection is encouraged.
- Large group meetings is discouraged.
- Web-based conferencing is advocated to enable routine scientific activity and departmental meeting.
- Large group teaching for post graduate courses are discouraged.
- Small group teaching and learning with good distance is encouraged.
- Research activities should be continued with good strength specially focus on new arrival COVID 19.

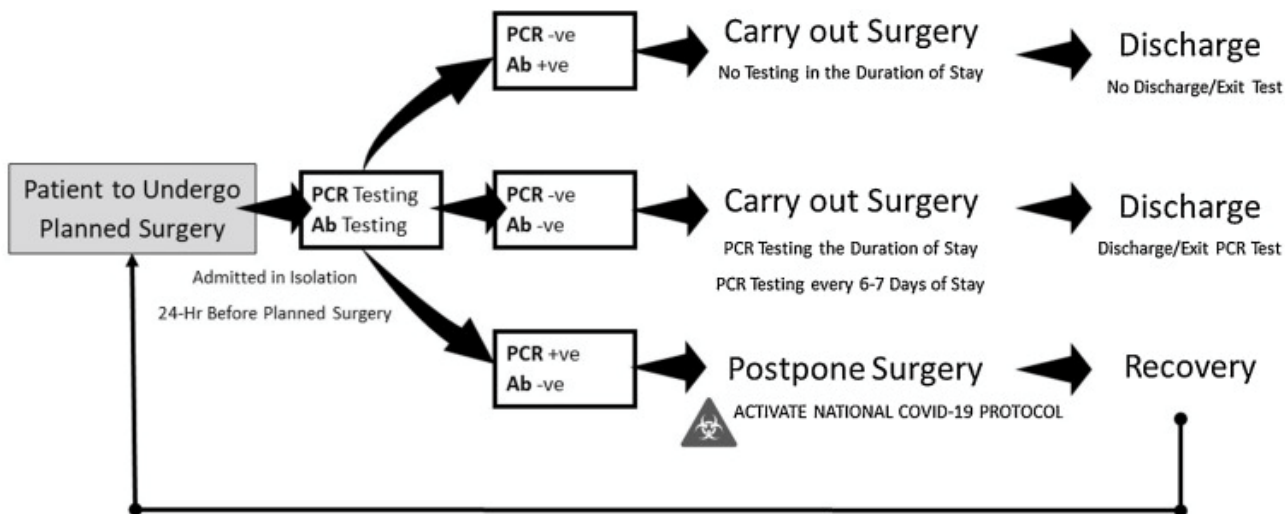
Testing Recommendation for COVID-19 Patients to Plane for Surgery in the Upcoming Days - Continuing the Service and Suppressing the Pandemic

We are going through a rapidly changing situation that has not been experienced before. Not being aggressive with testing while carrying out surgical services could have catastrophic consequences. The aforementioned recommendations may be expensive, but they can mitigate the risks to patients, staff, and public. These tests, when carried out in all surgical units, can also be a part of a pandemic suppression campaign leveraged to move the current crisis closer to the ideal situation, especially in the absence of therapeutics or vaccines.

- Taking these facts into consideration, patients who are scheduled for surgery should *always* be assumed to be potential carriers of the virus throughout the duration of their hospital stay, even if they pass the pre-assessment triage

including normal temperature, no history of exposure or travel, and no respiratory symptoms.

- Patients are to be “screened” with the gold standard PCR test 24 hours before the surgery as well as with an antibody screen and then isolated in their rooms with no visitors allowed. Antigen test by antigen kit could be good alternative to RT-PCR to reduce the cost.
- This is later limited to one visitor for 15 minutes a day at a distance of 1 to 2 metres away, wearing appropriate protection such as a surgical mask and a gown.
- Obviously, if patients show a positive result in the PCR test, they are isolated, the national COVID-19 public health protocols are followed (including protocols for exposed staff), and the surgery is postponed.
- If they show a negative result in the PCR, but are positive for the antibody, they will not require further testing during their hospital stay.
- If patients show negative results in PCR as well as in antibody tests, they are tested with PCR every week during their stay and always undergo an “exit test PCR” on discharge.
- Clinicians must be mindful that a negative test does not negate the possibility that an individual is infected.



NB: Antigen test by antigen kit could be good alternative to RT-PCR to reduce the cost in upcoming days.

Acknowledgement:

World Federation of Societies of Anaesthesiologists (WFSA)

American Societies of Anaesthesiologists (ASA)

Association of Anaesthetists of Great Britain and Ireland (AAGBI)

Indian Society of Anaesthesiologists

References:

<https://www.wfsahq.org/>

<https://www.asahq.org/>

https://en.wikipedia.org/wiki/Association_of_Anaesthetists_of_Great_Britain_and_Ireland

<https://www.isaweb.in/>