

**GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR**  
**MINISTRY OF HEALTH AND SPORTS**  
**DEPARTMENT OF MEDICAL SERVICES**



**RECOMMENDED GUIDELINES FOR SAFE SURGERY**  
**IN COVID 19 PANDEMIC ERA (Version 01)**

**Version - DoMS/COVID-19/clinical/Version 01-2020**

**Date - 14 August 2020**

# RECOMMENDED GUIDELINES FOR SAFE SURGERY IN COVID 19 PANDEMIC ERA

(Version 01)

(as of 14-8-2020)

## 1. PATIENTS ENTERING THE SURGICAL EMERGENCY

### 1.1. Triage of the patients

Patients entering the surgical emergency must undergo epidemiologic and symptomatologic screening for COVID-19 as guided by MOHS.

Those who are excluded from PUI criteria are treated as routine surgical patients regarding conservative and surgical management.

Those who are not included in the PUI criteria but still regarded as COVID-19 suspect, must be put in isolation room in surgical ward and manage under level II protection. Throat swab/serological test must be taken and result requested as priority. In the meantime, the patient is prepared for surgery.

if the result came back as negative, the patient will be operated in routine surgical theatre under level III protection.

if the result came back as positive, the patient will be operated at designated COVID-19 theater under level III protection and proceed to be managed in COVID-19 positive hospital facility as guided by MOHS.

The nature of urgent operations is attached in appendix A<sup>1</sup>.

### 1.2. emergency patients under the criteria of PUI

Those who are included in the criteria of PUI, are transferred to PUI ward and managed as guided under MOHS guideline. Throat swab/serological test must be taken and results requested as priority. In the meantime, the patient is prepared for surgery.

if the result came back as negative, the patient will be operated in routing surgical theatre under level III protection.

if the result came back as positive, the patient will be operated at designated COVID-19 theatre under level III protection and proceed to be managed in COVID-19 positive hospital facility as guided by MOHS.

The nature of emergency operations is attached in appendix A<sup>1</sup>.

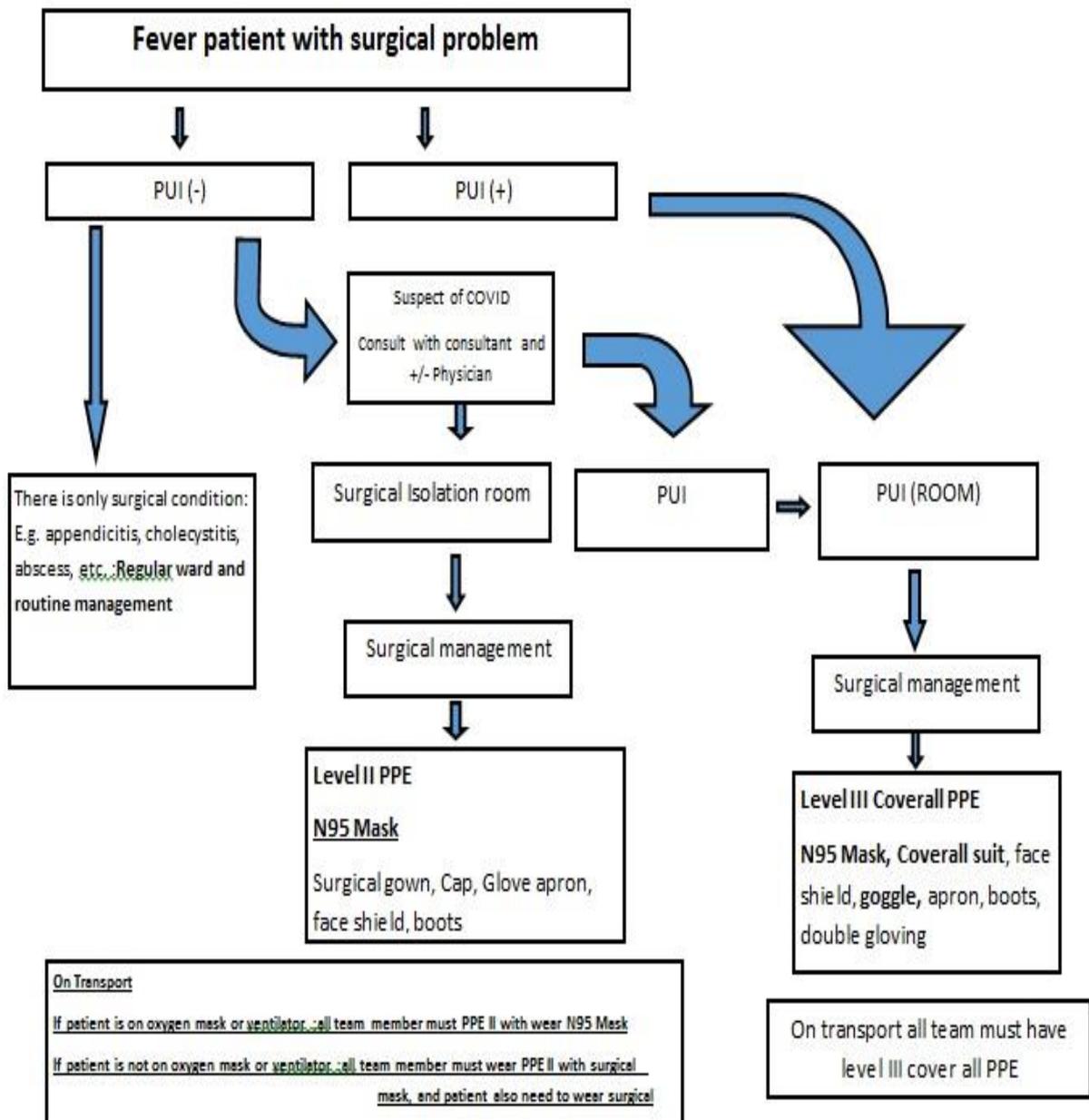


Figure 1. work flow of the patient entering the surgical emergency

## 2. ELECTIVE SURGERY

All Benign non-life-threatening surgery should be postponed to a later date.

All COVID positive elective cases must be postponed until the patient become negative

Malignant elective cases should be prioritized after risk assessment

Potentially curable cases, cases expected to recover quickly should be prioritized

Those patients with advanced malignant disease and co-morbid conditions should be referred to other adjuvant therapy.

Complicated malignant diseases like bleeding and obstruction should be regarded as emergency surgery and manage as such.

All elective patients undergoing surgery are advised to be self-isolated for 14 days prior to surgery. They must be screened by throat swab/serological test 48 to 72 hours prior to surgery.

If throat swab/serological test negative, proceed with surgery.

If a patient is positive on throat swab, postpone surgery at least by 14 days and repeat swab 48 hours before planned surgery date.

Accumulating evidence clearly demonstrates that a preop CT chest does not add to the detection of Covid-19 in an asymptomatic, isolated, and tested patient and is not recommended for screening before elective cancer surgery

Risk mitigation strategies must be practiced during surgical procedure. (eg Stoma)

Self-isolation for 14 days is advised following discharge after surgery

### **3. LAPAROSCOPIC SURGERY**

There is a risk of aerosol-type infection.

It is considered only in selected cases.

Appendicitis/ cholecystitis: conservative/open should be the preferred procedure.

In case undergoing laparoscopic surgery, limited use of lower energy device may reduce viral load.

The use of low pressure, low air flow insufflation is advised.

Desufflation by an appropriate suction device attached to HEPA filter.

Surgical team must wear level 3 PPE with or without PAPR. Indications for PAPR usage is attached at Appendix B<sup>2</sup>.

### **4. ENDOSCOPIC PROCEDURE**

Urgent endoscopy should be performed in acute gastrointestinal bleeding, biliary sepsis, foreign body removal and gastrointestinal obstruction requiring stenting.

Semi-urgent endoscopy should be performed in patients who require endoscopy for highly suspicious cases of cancer or ERCP for hepatobiliary pancreatic cancers.

All routine diagnostic endoscopy or surveillance and follow-up endoscopy should be deferred until further notice<sup>3</sup>.

Procedure	Standard PPE For non-suspected / test -ve cases	Enhanced PPE For high risk/ confirmed COVID 19	Manpower	Frequency of gown donning
OGDS	Surgical mask/ N95 PPE level 2 Standard scopy room	N95/PAPR PPE level 3. Negative pressure room	Endoscopist 1 Nurses 2	Mask: end of each session Gown: change when contaminated Gloves: after each case
Colonoscopy	Surgical mask/ N95 PPE level 2 Standard scopy room	N95/PAPR PPE level 3. Negative pressure room	Endoscopist 1 Nurses 2	Mask: end of each session Gown: change when contaminated Gloves: after each case
ERCP	Surgical mask/ N95 PPE level 2 Standard scopy room	N95/PAPR PPE level 3. Negative pressure room	Endoscopist 1 Nurses 2	Mask: end of each session Gown: change when contaminated Gloves: after each case
Arthroscopy	Surgical mask/ N95 PPE level 2 Standard scopy room	N95/PAPR PPE level 3. Negative pressure room	Endoscopist 1 Nurses 2	Mask: end of each session Gown: change when contaminated Gloves: after each case
Bronchoscope	N95/PAPR PPE level 3. Negative pressure room	N95/PAPR PPE level 3. Negative pressure room	Endoscopist 1 Nurses 2	Mask: end of each session Gown: change when contaminated Gloves: after each case

## 5. FACTORS TO BE CONSIDERED IN RECOVERY OF ELECTIVE SURGICAL SERVICES IN POST COVID ERA

**5.1. Timing** : sustained reduction in the rate of new COVID-19 cases for 14 consecutive days

**5.2. Testing** : both PCR and serological test must be available with clear policies for testing requirements

**5.3. PPE** : adequate PPE and surgical supplies

### 5.4. Essential perioperative services

: (e.g. diagnostic imaging, laboratories, anaesthesia , critical care, sterile processing)

### 5.5. Hospital facilities

: patient ward with proper spacing, isolation ward, ITU

### 5.6. Surgical work force

: adequate team members of surgery with complete protection, practicing social distancing, universal precaution. They must have adequate training and communication without having stress or fatigue. Adequate screening program for health personnels must be established.

## 6. SETTING UP COVID OT

Designated operation theatre must be used for all confirmed COVID-19 infected patients.

Theatre must be labelled as COVID-19 operation theatre.

Large clear billboards and signage in local language and/or English.

**6.1. Operation theatres:** 2 covid OTs if possible. One for obstetrical surgical procedures and second for general surgery/ orthopaedic procedures for all age groups.

**6.2. Location:** OTs should be in dedicated COVID Block/ Centre if possible. There should not be any adjoining inhabited buildings within 20 meters. It should be near COVID ICU, HDU, isolation ward and emergency ward.

**6.3. Changing Room:** There must be independent changing rooms with toilet and shower facility. It must be provided with automatic doors.

**6.4. Donning Area:** There must be dedicated donning room adjacent to scrub room. PPE Kits should be available in adequate number.

**6.5. Doffing Area:** There must be dedicated doffing room with hand sanitization facility and waste collection bins. PPE should be disposed according to Biomedical Waste Management guidelines.

**6.6. Separate Entry and Exit:** Entry to donning area and exit from doffing area should be separate to avoid mixing up of the health care workers

**6.7. Air conditioning:** airborne infection isolation requirements (AIIR) have to be strictly enforced. OT should be in non-recirculatory (air conditioning) system. Air handling unit (AHU) will have provision to receive adequate outdoor air supply. It should not be from within the building. Exhaust blower should be provided to extract the room air and exhaust out into the atmosphere, after suitable "exhaust air treatment".

The exhaust air quantity should be greater than the supply air quantity so that a negative pressure of minimum 2.5 Pa (preferably >5 Pa) is achieved in room. Supply air quantity should provide a minimum of 12 air changes per hour. Position of the extract air duct in the OT should be just above the head of the patient.

Best another option, the COVID OT can have stand-alone room air-conditioners (two split air-conditioners of 2 tons refrigeration capacity per OT)

Fresh air intake through a fan filter unit will prevent outdoor dust entry (containing high levels of PM<sub>10</sub> & PM<sub>2.5</sub> particles) & exhaust fans should be kept operational. Set the room temperature between 24°C & 30°C. Maintain humidity between 40% & 70%. Use fans in dry climates (30°C) to increase air movement. Negative pressure could be created by putting up 2-3 exhaust fans. Treatment of exhaust air can be done preferably by high efficiency particulate air (HEPA) filtration or by chemical disinfection (1% hypochlorite). Other 2 options available for exhaust air treatment are Ultraviolet (UV) irradiation (15 min) & Heating (45 min at temp of 75 °C)

**6.8. Equipment:** Remove all non-essential equipment & gadgets. Place all equipment & drugs essential for anaesthetic management in a tray. Surgical equipment, linens & dressing which are essential should be kept ready on separate trolleys.

**6.9. Transparent Plastic Sheet Covers:** All monitors, cables, anaesthesia work station/machine, cautery, operation table, patient trolley must be covered. These coverings should be removed & changed after each case.

**6.10. Heat and Moisture Exchanger with viral filters:** Place 2 high HMEFs. First, between tracheal tube and breathing circuit. Second, between expiratory limb and anaesthetic machine.

**6.11. Aerosol Generating Procedures (AGP):** Tracheal intubation and extubation, suctioning, nebulization, CPAP, BiPAP, high-flow nasal oxygen therapy, bronchoscopy, etc are aerosol generating medical procedures.

The chances of exposure to the virus are maximum during such procedures.

During AGPs, all health care workers should always wear full component of proper PPE kit.

(Cover all gown, N95 mask, eye shield, cap, double gloves, shoe cover)

**6.12. Number of personnels inside COVID OT:** There should be minimum required personnel inside the COVID OT. On an average 7-8 PPE Kits are required for a surgical procedure (e.g. 2 surgeons, 1 nurse, 2 anaesthetists, 1 anaesthetic technician, 1 paediatrician, 1 resource person, 1 sweeper, 1 transfer personnel)

**6.13. Communication Issues:** Team should practice sign language. No bag, purse, mobile phone should be allowed. If intercom facilities are not available, one mobile phone with transparent covering can be used.

**6.14. Sterilization and Decontamination:** Approximately one hour between 2 cases. Hydrogen peroxide spray disinfection through hydrogen peroxide generator (VHPG). 1% sodium hypochlorite solution or 75% alcohol wiping off equipment and floor.

Seal all used airway equipment in a double zip-locked plastic bag. Discard breathing circuit, mask, tracheal tube, HME filters, gas sampling line and soda lime after every surgery. Water trap should be changed if it becomes potentially contaminated.

All surgical linen and dressings, etc. are to be discarded. All unused items on the drug tray and airway trolley should be assumed as contaminated and to be discarded.

Histopathological specimen kept in tight fit plastic boxes, sealed in plastic bags.

Metallic equipment to be kept in 1% sodium hypochlorite solution for half an hour, then washed and wiped clean. Sent to CSSD should be covered in plastic bags and clearly labelled. Surfaces of passage ways and the elevator should be cleaned with sodium hypochlorite and alcohol.

**6.15. Wheeling in the patient:** COVID-19 infected patient is wheeled through a separate/ isolated corridor to the operation theatres. Patient should not stay in premedication room. Patient should wear autoclaved operation theatre clothes, cap, surgical/N95 mask, covered with plastic sheets.

**6.16. Wheeling out the patient:** Tracheal extubation should be done on the table and place the surgical/N95 mask. If not feasible to extubate, transfer to COVID ICU. Patient should not be kept in recovery room and should be transfer directly to the isolation ward.

**6.17. Transfer to isolation ward/ ICU:** Transport personnel should change PPE. Patient should wear autoclaved operation theatre clothes, cap, surgical/N95 mask, cover with plastic sheet.

**6.18. Use of Blood Products:** Routine blood donor screening measures are used. No contraindications of blood transfusion to COVID patient.

**6.19. Neonatal care/ resuscitation:** Preferable to do neonatal care/ resuscitation after LSCS in the second OT or outside the COVID OT

**6.20. Staffing the COVID OT:** Minimum number of staff for working in shifts in COVID OT. Institutional policies for quarantine of staff working COVID OT should be made. Staff who does not want to go home will have to be given suitable accommodation by the hospital. Any health care workers who develop flu like symptoms should immediately inform authorities.<sup>4</sup>

## Appendix A

### Emergency procedures to be performed in < 24 hours

General surgery (upper GI, HPB, colorectal, breast, endocrine)	Emergency laparotomy (peritonitis/perforation/ischaemia/Necrotising fasciitis)	Emergency laparotomy - bleeding not responding to endoscopic / interventional radiology	Appendicectomy - complicated/unresponsive to conservative Rx appendicitis	Intra-abdominal trauma which cannot be managed conservatively	Laparotomy for post-operative complications ( eg anastomotic leaks/ bleeding)
	Drainage of localised sepsis/ necrosis if not responding to conservative Rx	Benign Perforated oesophagus/ stomach - with survivable mediastinitis/ peritonitis	Acute airway obstruction - thyroid		
Oral and facio-maxillary surgery	Haemorrhage from maxillary/ mandibular trauma not responsive to conservative Rx	Dental Sepsis - not responding to conservative Rx and threatening life/ airway/sight/ brain.	Orbital Compartment Syndrome/Muscle Entrapment - threatening sight	Jaw Dislocation - not responding to conservative Rx	
Reconstructive plastic surgery including burns and hands	Major burns - Airway management/ resuscitation/ escharotomies/ amputations/ Toxic Shock	Chemical burns - especially Eye	Necrotising Fasciitis - any site	Soft tissue infection - any site (especially closed compartments/ joints) not responding to conservative Rx	Revascularisation/ reimplantation / failing free flap - any site
	Washout open wound/fractures/ infected/ contaminated - any site	Removal of prosthesis/expander for fulminant infection			
Urology	Renal obstruction with infection - not responding to conservative Rx	Renal/ureteric trauma requiring open surgery	Bladder trauma requiring open surgery	Genital trauma/ Fournier's gangrene	Haematuria/ uncontrolled haemorrhage
Trauma and orthopaedics	Fractures - Open/ Neurovascular compromise/Skin compromise/ Long Bone/Pelvis/Spine/Hip	Septic arthritis - natural/prosthetic joint	Dislocated joints	Compartment syndrome	
ENT	Airway obstruction - Cancer/Foreign body/Sepsis	Neck trauma with vascular/visceral/ airway injury	Nasal/ear button battery removal	Life threatening middle ear conditions	Orbital cellulitis

Neurosurge ry	Traumatic Brain injury - unsuitable for conservative RX	Traumatic spinal injury - unsuitable for conservative RX	Intra-cranial haemorrhage - not responding to conservative RX	Acute raised Intracranial pressure/ hydrocephalus (recoverable stroke/ tumour)	Cauda Equina Syndrome/ Acute spinal cord compression - not suitable for conservative Rx
Cardiothoracic surgery	Ruptured bronchus/ Chest Trauma	Myocardial infarction - imminent death	Empyema with sepsis	Aortic dissection/ Acute mitral valve disease	Acute presentation of ventricular septal defect
Vascular surgery	Vascular injury/ occlusion (Limb - including compartment syndrome and GIT)	Uncontrolled external haemorrhage - any site/source	Ruptured AAA		
Paediatric general and urological surgery	Neonatal Malformations needing emergency correction (life threatening) - Oesophageal Atresia, Gastroschisis, Anorectal Malformations	Emergency Neonatal Laparotomy - Necrotising Enterocolitis (NEC), Perforation, Malrotation	Emergency laparotomy (peritonitis/ perforation/ ischaemia/ Necrotising fasciitis)	Emergency laparotomy - bleeding not responding to conservative management	Laparotomy for post operative complications (eg anastomotic leaks/ bleeding)
	Appendicectomy - complicated or unresponsive to conservative Rx	Thoracotomy / Chest Drain Insertion / Video Assisted Thorascopic Surgery (VATS) for Empyema	Laparotomy for intussusception Strangulated inguinal hernia	Acute Scrotal Exploration (suspected Testicular Torsion)/ Renal Obstruction with infection - not responding to Conservative Rx	Trauma Thoracotomy Trauma Laparotomy Removal of Infected Central Line
Paediatric Orthopaedic surgery	Septic arthritis/ osteomyelitis	Fractures - Open/ Neurovascular compromise/Skin compromise	Dislocated joints	Compartment syndrome	
Obstetrics	Cat I and Cat II Caesarean Section	Instrumental delivery	Conditions requiring emergency laparotomy like primary postpartum haemorrhage, manual removal of placenta etc.,		
Gynaecology	Ruptured ectopic pregnancy	Ovarian accident	Miscarriage complications requiring emergency procedures. EUA		
Please note	Any delay in treatment, especially of cancers, trauma and life threatening conditions, may lead to adverse outcomes.				

## Appendix B

### Appropriate Use of Powered Air-Purified Respirators (PAPRS) In Known or Suspected COVID-19 Patients

- PAPRs will be available at each hospital for team members who:
  1. Cannot wear N-95 or North masks (determined by fit testing) OR
  2. Appropriately sized N-95 masks are unavailable AND another clinician with an appropriate N-95 mask is unavailable to perform the necessary patient care OR
  3. The necessary procedure cannot be appropriately performed with an N-95 or North mask
  
- When the patient is COVID-19 positive, symptom screening / PCR testing is not available and use of a N-95 or North mask is not possible, appropriate indications for use of a PAPR include (this list should not be considered all-inclusive):
  - Surgical procedures that involve opening the airway or sinuses
  - Endotracheal intubation and extubation
  - Cardiopulmonary resuscitation (CPR) – immediate code team only
  - Open airway suctioning
  - Endoscopy
  - Collection of diagnostic naso/oropharyngeal specimen collection
  - Aerosolized respiratory treatments (nebulizations)
  - Autopsy of suspected or confirmed COVID-19
  
- Each operating room should have a PAPR cart available containing the following:
  - PAPR motors / filters, hoses, hoods and pressure testers
  - Gloves
  - Super Sani-cloth wipes
  - Alcohol hand foam
  - Hydrogen peroxide
  - 4 x 4 gauze (to use with hydrogen peroxide to clean splashed blood)
  - 3” plastic tape to secure surgical gowns around PAPR motors
  - Handheld dry erase boards (2) (for communication through the operating room window)

### COVID ရောဂါကာလအတွင်း အသိပေးသဘောတူညီချက်

လူနာအမည် -----၊ အသက် -----၊ ဆေးရုံ ID နံပါတ် -----၊ ရောဂါအမည် ----- ဖြင့် COVID-19 pandemic ကာလအတွင်း အရေးပေါ်/ ပုံမှန်ပြင်ဆင်ခွဲစိတ်ရန် လူနာနားလည်သဘောပေါက်သော စကားလုံးဖြင့် ရှင်းပြခဲ့ပါသည်။ ဤအချိန်အတောအတွင်း ဆေးရုံတိုင်းကို COVID-19 ဗိုင်းရပ်စ်ကူးစက်ရန် အန္တရာယ်ရှိသောဇုန်ဟု သတ်မှတ်သည်။ ထို့ကြောင့် လူနာ၊ လူနာစောင့်၊ ဆေးရုံဝန်ထမ်းများ သို့မဟုတ် ကုသနေသောဆရာဝန် တစ်ဦးဦးသည် ရောဂါလက္ခဏာမပြသော ပိုးသယ်ဆောင်သူ/ မမျှော်လင့်ဘဲ COVID-19 လူနာဖြစ်နိုင်ပြီး ခွဲစိတ်ကုသသော လူနာသည် ဤကာလအတွင်း ရောဂါကူးစက်နိုင်ချေရှိပါသည်။ ၎င်းသည် အချိန်ကြာမြင့်စွာ ဆေးရုံတက်ခြင်း၊ အထူးကြပ်မတ်ကုသဆောင်သို့ လွှဲပြောင်းခြင်း၊ စောင့်ရှောက်ခြင်းနှင့် ဤအခြေအနေများ အသက်ဆုံးရှုံးမှုအန္တရာယ် ၂၀ရာခိုင်နှုန်းအထိ တိုးလာနိုင်ပါသည်။ ဤဆေးရုံတွင် လတ်တလော၌ COVID-19 စစ်ဆေးခြင်းကို ပုံမှန်ဆောင်ရွက်မပေးနိုင်သေးပါ။

ဤအချက်အလက်များကို နားလည်သဘောပေါက်ပြီးဖြစ်၍ ကျွန်တော်/မသည် ဤဆေးရုံတွင် ကုသရန် သဘောတူပြီး ဖြစ်ပါသည်။ ဤလူနာတွင် COVID-19 ကူးစက်မှု၏ လက္ခဏာများ (ဖျားခြင်း၊ ချောင်းဆိုးခြင်း၊ အသက်ရှူရခက်ခဲခြင်း၊ အရသာခံစားမှုလျော့နည်းခြင်းနှင့်/ သို့မဟုတ် အနံ့မရခြင်း) လတ်တလောတွင် မရှိကြောင်းကိုလည်း မေးမြန်းပြီး ဖြစ်ပါသည်။ ဤသို့သော ကူးစက်မှု မဖြစ်စေရန် ဆရာဝန်မှ ဖြစ်နိုင်သမျှ ကြိုတင်ကာကွယ်မှုများ ပြုလုပ်မည် ဖြစ်ကြောင်း ကျွန်ုပ် နားလည်ပါသည်။ လူနာ၏ လုံခြုံရေးအတွက် သတ်မှတ်ထားသော လုပ်ထုံးလုပ်နည်း အားလုံးကို လိုက်နာမည်ဟုလည်း ကျွန်ုပ် ကတိပေးပါသည်။ လိုအပ်သော အကာအကွယ် ပစ္စည်းများအတွက် အပိုကုန်ကျစရိတ်နှင့် ပတ်သက်သည့် အကြောင်းကိုလည်း သိရှိပြီး ဖြစ်သည်။ တာဝန်ကျဆရာဝန်တို့၏ ခွဲစိတ်ကုသမှုကိုလည်း သဘောတူပါသည်။ ညွှန်ကြားထားသော ကာကွယ်မှုအားလုံးကို လိုက်နာသော်လည်း လူနာသို့မဟုတ် လူနာစောင့်တွင် COVID-19 ရောဂါပိုး ကူးစက်ခံရနိုင်သော အလားအလာရှိနေသေးကြောင်း နားလည်လက်ခံပါသည်။

အထက်ပါအချက်အလက်များကို ဆရာဝန်မှ ပြည့်စုံစွာ ရှင်းလင်းပြီးဖြစ်၍ လူနာနှင့် လူနာစောင့်မှ နားလည်ပြီးဖြစ်ကြောင်း ခံဝန်ကတိပြုပါသည်။

လူနာ	သက်သေ/စကားပြန်	ခွဲစိတ်ဆရာဝန်
အမည်	အမည်	အမည်
လက်မှတ်	လက်မှတ်	လက်မှတ်
ဖုန်းနံပါတ်	ဖုန်းနံပါတ်	ရာထူး
ရက်စွဲ	ရက်စွဲ	

## Special notes

It should be highlighted that the recommended guidelines suggested in this document are general guidelines. Each and every hospital should tailor it after proper consultation with the hospital administrators and specialists regarding the feasibility of the institution.

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