

COVID STANDARD OPERATING PROCEDURE FOR RADIOLOGICAL PROCEDURES



**Department of
Imaging Sciences & Interventional Radiology,
Sree Chitra Tirunal Institute for Medical Sciences and
Technology, Trivandrum**

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(Approved by Covid Cell, SCTIMST)

Introduction

COVID-19, caused by severe acute respiratory syndrome coronavirus (SARS-CoV-2), is now a worldwide pandemic. As part of radiological preparedness in SCTIMST, this document advises standard operating procedures for performing various radiological procedures in COVID confirmed/ suspected patients.

The SOP aims,

(a) to achieve sufficient capacity for continued operation during a health care emergency of unprecedented proportions,

(b) to support the care of patients COVID-19/ suspected patients, and

(c) to maintain radiologic diagnostic and interventional support for the entirety of the hospital and health system.

In dealing with COVID-19 patients/ suspects in India, imaging should be focused on Portable Radiographs and Bedside portable Ultrasound. Avoid unnecessary patient transport to the department. Frequency of imaging to be based on clinical status of patient, as and when needed. No need for routine daily imaging.

The standing order for the department are to be read in conjunction with the other provisions in Hospital Standing Orders of SCTIMST.

STANDARD OPERATING PROCEDURE (SOP) FOR PERFORMING PORTABLE CHEST X-RAY

Main aim is to minimise radiographers stay in patients room, minimise contact with patient as practically possible ensuring patient and staff safety

Appropriate trained and fit tested radiographers to undertake portable chest x-ray

Portable X ray machine used for COVID positive/ suspect patients shall be station in the corresponding isolation ward/ ICU. The machine shall not be used for general use in other patients. Decontamination of the X ray machine shall be done by the cleaning team in the isolation ward/ ICU.

Separate log book for portable x-ray machine's downtime (For decontamination and passive air exchange). 1 hour downtime is essential for portable machine for decontamination and passive air exchange depending on the agent used.

REQUEST:

Online request for portable chest X-ray for COVID patient with indication and to inform duty radiographer in x-ray room (Ph. Extension: 414)

Work-flow:

Before arrival at patient's room:

1. Portable X-ray machine that is most appropriate (post 1 hr downtime) will be used.
2. Co-ordination with clinical team to arrange time for chest r-ray, so that nursing staff are ready. Ensure with nursing staff that patient is wearing a surgical mask
3. Radiographers with shifting staff work in pairs.
4. Insert patient details and place X-ray detector in plastic sleeve before proceeding to patient's room.
5. Radiographer and shifting staff first to wear radio protective lead apron. Then to wear full PPE as per institute guidelines.

In patient's room:

1. First recheck if patient is masked and that there is enough space for manoeuvring the machine, if not ask for staff nurse help for arrangement
2. If patient co-operative- verbal instructions to patient about exam and ask the patient to sit-up. If patient sedated, ask for additional nursing staff help for placing x-ray detector
3. Place the detector behind the patient, with minimal contact with patient and surroundings. Ensure detector is placed appropriately
4. Sanitize gloved hands and centre the intensifier
5. Sanitize gloved hands and expose. Ensure adequacy of image on monitor
6. Take x-ray detector from behind the patient and place sleeved detector on floor
7. Sanitise gloved hands, remove detector from sleeve and place in portable machine
8. Discard the sleeve and sanitise gloved hands
9. Open patient room door, transport portable machine to anteroom. Sanitise gloved hands in anteroom. Clean and disinfect machine and detector in the anteroom
10. Then remove PPE as per institute guidelines. Transport machine out of anteroom and post process the image

Work-flow steps:



**1. Confirm patient details on receiving request ,
Fix time, availability of staff, check
downtime for portable CXR machine from log book**



**2. At Anteroom: Enter patient details
Wear lead apron followed by PPE as per guidelines**



**3. Placing X-ray detector in plastic sleeve and placing
detector into portable machine or carried by
accompanying shifting staff**



**4. Make sure patient is masked and
adequate space for machine manoeuvring**



**5. Placing detector behind the patient and
sanitise the gloved hands**



**6. Center the intensifier and sanitise the gloved
hands**



7. Step-out, then expose and check for adequacy of exposure



8. Take detector from patient, place sleeved detector on floor and sanitise the gloved hands



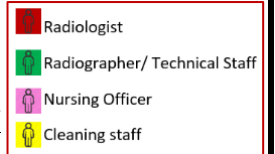
9. Remove detector from sleeve, place in machine's detector stand, discard the sleeve and sanitise the gloved hand



10. Move machine into anteroom, sanitise gloved hands
Clean and disinfect the machine and detector
At last remove PPE as per institute guidelines

Video link for examples - <https://youtu.be/6JyOnjDop68> (For performing portable CXR)
https://youtu.be/_6iqmx46nrY (For safety check-list)

STANDARD OPERATING PROCEDURE (SOP) FOR CT SCAN



General Instructions in CT room:



- CT scan shall be used only if considered essential in clinical decision making for management.
- Use can be limited to patients with severe respiratory complications, unexplained by combined use of Chest radiography and bedside portable ultrasound.
- All CT scans are to be taken in the CT room opposite to the mortuary. If unavoidable or if detailed study is deemed necessary, CT in imaging complex ground floor may be used.
- All communication between technician- Radiologist, Tech/ Radiologist – Referring doctor, radiology staff – admin should be strictly via telecommunication.
- Ensure minimum contact to staff with patient.
- Ensure minimum time spent by patient in imaging complex.
- Ensure all movable equipment in scan room to be shifted out.
- Cover all non movable equipment covered with transparent plastic sheet prior to patient arrival and removed post procedure.
- Contrast CT scans are to be generally avoided.
- In case contrast administration is needed, accompanying nursing staff to ensure adequate i v access.
- All consents for contrast administration in CT to be taken by clinical team in ICU/Ward/ OPD before shifting to imaging complex.
- Ensure thorough cleaning of surfaces especially contact areas with disinfectants as per institute protocol.
- Only minimal staff to be posted for taking such cases, with staff preferably on shift duties continuously for 7-14 days. Subsequently, next set of staff to replace them for the next 7-14 days according to staff availability.
- Make sure the radiographer 2 and accompanying staff coming with the patient must not enter the CT console room. They should wait in the corridor outside the console while the scan is going on and till it is finished. Once scan is finished, they can re enter the scan room and shift patient back to the bed.
- After shifting the patient back to admission area, thorough cleaning of Scanners with alcohol based sanitizers must be done after wearing PPE. Close the scanning room for required time (according to the sanitizer contact time) .

STANDARD OPERATING PROCEDURE (SOP) FOR INTERVENTIONAL RADIOLOGY PROCEDURES

AIM:

- Safe and effective IR procedures on patients
- To minimize the movement of infected patients and its attendant risk of nosocomial transmission of infection.
- To protect the staff in IR suite by reducing risk of transmission to them.

GENERAL PRECAUTIONS:

- It is necessary to delay non-urgent procedures until the crisis period is over, though no medically emergent procedure is denied. Emergency procedures are to be decided carefully after proper communication between the radiologists and referring physician.
- Ultrasound guided interventions are to be preferred.
- Portable USG to be used in isolation room of the suspected/ confirmed COVID positive patients. All necessary portable USG precautions must be taken (as described in SOP for portable USG).
- If patient transfer is mandatory, preplanned routes straight into the procedure suite, designated for infectious patients should be used. (That is, the entry point of all confirmed cases should be limited to one designated section).
- Under appropriate circumstances, physical barriers may be placed to limit interpersonal contact.
- Radiology personnel may be divided into a few teams as this separation prevents disabling of entire IR team, should quarantine be required.

INSTRUCTIONS FOR PATIENTS AND REFERRING PHYSICIAN:

1. Vetting, triage and verification of patient details to plan the case schedule such that only emergency IR cases to be given priority with concomitant rescheduling of elective IR cases.
2. Verifications of instructions for the procedure.
3. Stratification of a patient's infectious risk and necessary preventive measures such as making the patient wear face mask etc. to be done as per institute ICT protocols.
4. Suspected or confirmed patient should wear face mask and other protective equipment as per our institute protocol.
5. Referral to infectious disease physician, when there is doubt.
6. All the pre procedural instructions to be completed, before a patient is called down for any procedure. This is imperative to prevent unnecessary exposures due to aborted or cancelled procedures and minimize the time spent in the department.

INSTRUCTIONS FOR STAFFS:

1. Frequent hand washing
2. Proper surgical scrubbing
3. Adoption of Full Personal Protective Equipment (PPE), as per our institute protocol.
4. There should be no compromise in the sterility as a result of donning PPE.
5. Nonessential and mobile equipment are moved out of the procedure room to avoid possible contamination.

6. Immobile or essential equipment within the procedure suite is covered with disposable plastic covers or paper drapes to reduce the amount of cleaning subsequently required.
7. Surfaces that are difficult to disinfect are also to be covered accordingly.
8. Non-disposable linen should preferably not be used.
9. Clean and contaminated work areas are to be clearly demarcated to contain contaminated objects and subjects, thereby facilitating subsequent clean up

POST PROCEDURE CLEAN UP:

1. Exercising equivalent care in removal of PPE gown to be undertaken, to avoid contamination to oneself or our colleagues.
2. Proper disposal of soiled PPE and cleaning of used N95 masks/ hoods is the responsibility of everyone.
3. Access to reporting workstation and writing post-procedure case notes by the radiologist, are allowed only after proper PPE removal.
4. The radiographers should ensure thorough cleaning up of imaging equipment.
5. Staff nurses should ensure proper disposal of instrument and supplies.
6. Non disposable instruments are soaked in antiseptic solution before decontamination and sterilization.
7. Exposed surfaces including door handles, arm guards, TV monitors, console panels in the console room and keyboards are to be wiped with 70% ethanol or chlorhexidine-ethanol wipes.
8. Designated sink for body fluid disposal and using PPE during the disposal process
9. All disposable plastic coverings are changed in between patients.
10. Biohazard and disposal bags are discarded based on a principle of single patient use.
11. Floors are mopped with EPA-registered hospital grade disinfectant and rooms are ventilated for at least 30 minute before bringing in next patient.
12. Vacuuming and mechanical buffing of floors were halted to reduce the risk of aerosolization.
13. Education and rigorous training of all the staffs.

REVIEW OF RESUSCITATION PROTOCOLS:

Adequate PPE to be donned by the resuscitating physician, even at the expense of prolonging the time to initial resuscitation.

RADIATION PROTECTION VS INFECTION CONTROL:

1. Only a limited required number of staffs (radiologists including consultant and trainees, anaesthetists, technical staffs) to stay inside the fluoroscopy suite.
2. The personnel inside the fluoroscopy suite, are not allowed to step out into the console room, to avoid contamination of less adequately protected staff staying outside the fluoroscopy suite.
3. Maximization of inverse square law to reduce the radiation exposure can be done

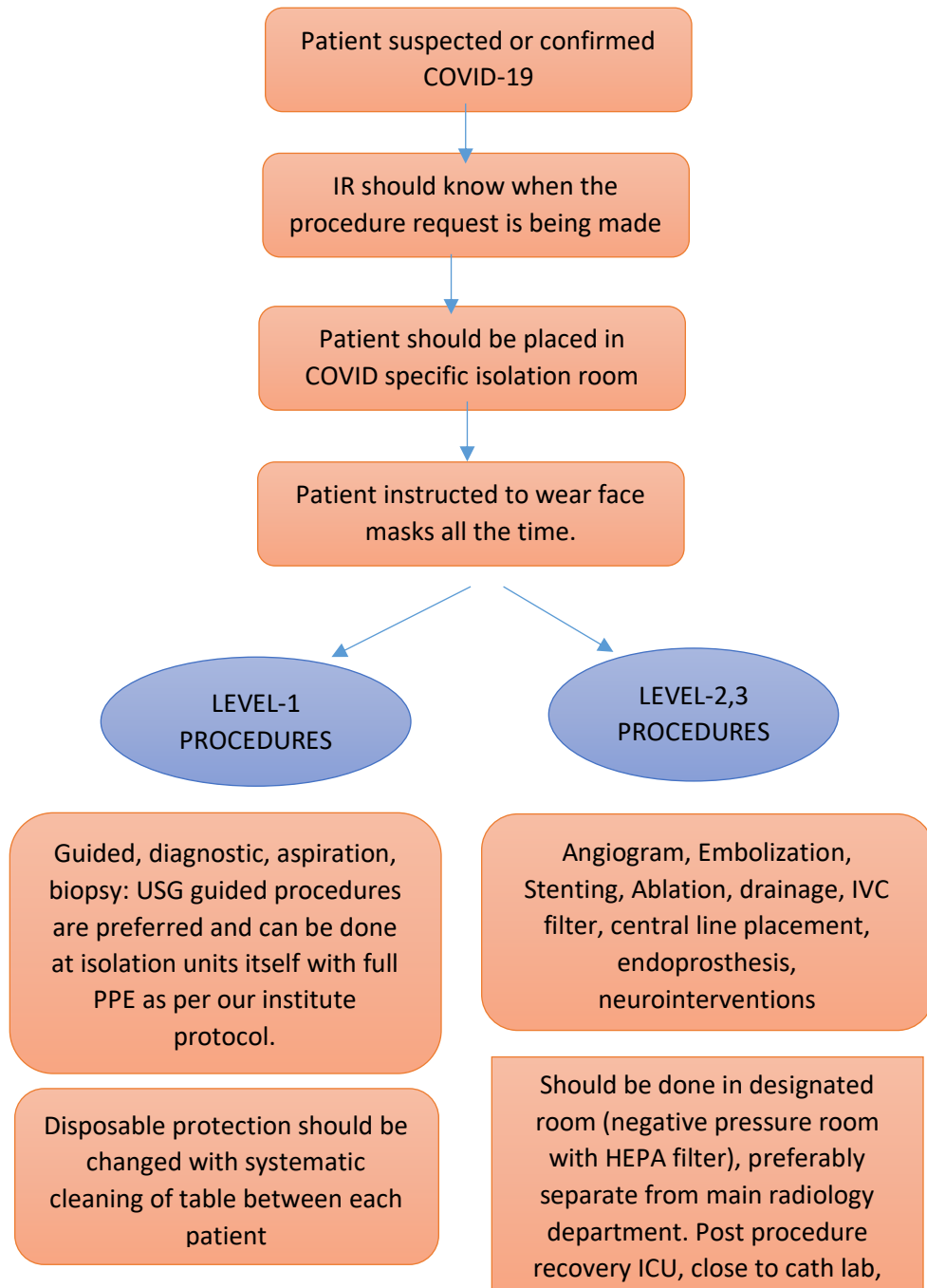
TEAMS:

Operator team: Physician operator and assistant, Anaesthetist (based on the requirement for the procedure).

Support team: Staff who is sterile and with full PPE, Technologist who is not sterile but donned with full PPE. These teams should have minimal movement in and out of the potentially contaminated room.

VENTILATION:

Usual arrangement is made such that air first passes over the patient and to the staff. The rationale is to reduce the likelihood of transmission from the operator to the patient. But converse is required while treating patient who is suspected or confirmed of airborne infections (like COVID19). Air first passes over the staff and then to the patient, limiting the exposure of the staff to the contaminated air



STANDARD OPERATING PROCEDURE (SOP) FOR PERFORMING PORTABLE USG

Ultrasonography shall be performed only in exceptional circumstances to assist radiographic interpretation. In case of inescapable requirement, one dedicated portable scanner should be available in the ward/ICU handling suspected/probable/confirmed COVID 19 patients for bed side USG. This scanner will be used only for the ward/ICU handling suspected/probable/confirmed COVID 19 and will not be moved out of the premises of the ward/ICU. No patient to be shifted to radiology department for USG. The machine shall be cleaned and decontaminated after each use by the cleaning staff in ward/ICU. If the suspected/probable/confirmed COVID 19 patient must be scanned in the radiology department, this should be done at the end of the USG list, as the room and equipment will subsequently require a deep clean.

PROCEDURE TO BE FOLLOWED

1. Ultrasound will be performed by the designated senior resident called upon to perform the scan.
2. All attending medical staff should don PPE (respirator, such as N95 or FFP3, goggles, face protective shield, surgical gown and gloves) prior to entering the ward/ICU. Donning & Doffing procedures will be diligently & carefully followed for the Personal Protective Equipment (PPE) as per WHO guidelines. PPE will be changed after every case and discarded.
3. The number of transducers connected to the ultrasound machine should be reduced to a minimum, usually one curvilinear transducer to be used, and all other transducers should be stored safely in a clean closed cabinet and brought out when needed. The probe and USG machine has to be covered with plastic sheets. Camera covers maybe used for transducer.
4. Use of single-use gel packs is recommended as opposed to gel containers.
5. Reports will be handed over to the requisitioning clinician after completion of scan.
6. Ultrasound probes, machine including monitor, keyboard and cables are to be disinfected thoroughly with high level disinfectants(High-level disinfectants include ethanol 80-95% (exposure time 30 sec), 2-propanol 75-100% (exposure time 30 sec), 2-propanol and 1-propanol 45% and 30% (exposure time 30 sec), sodium hypochlorite 0.21% (Antisapril Blu 2%, exposure time 30 sec), glutaraldehyde 2.5% (exposure time 5 min) and 0.5% (CIDEX OPA, exposure time 2 min), hydrogen peroxide 0.5% (REVITAL-OX RESERT, exposure time 1 min) after every scan by the ward/ICU staff.