



SUMMARY OF SEGREGATION & RE-CONFIGURATION OF RADIOLOGY DEPARTMENTS AND IMAGING CENTRES DURING COVID-19

An Article by College of Radiologists, Singapore

Principles:

1. The intent of manpower segregation is for preservation of services and business continuity in the event of infection of team members.
2. Breaking up the department into teams and isolating them would greatly reduce the likelihood that the entire department will be infected.
3. In the eventuality that one or more of the teams are down, the remaining team(s) should be able to maintain essential services to keep the department running.
4. Segregation can take various forms (temporal or spatial) and may be implemented differently in the different groups of personnel within the department.
5. Measures described are non-prescriptive and should be adapted to suit the requirements of the department and according to the degree of redundancy in manpower. For example, departments providing 24/7 acute services with Emergency, Inpatient and Outpatient requirements may have to adopt different strategies from those with predominantly outpatient imaging services.

Temporal Segregation:

Departments with sizable manpower capability can consider temporal segregation of the staff, dependent on their roles and responsibilities as well as the individual group manpower numbers.

Separation of Radiologists into active / passive, onsite / offsite, at home / at work teams with no interactions between the teams is easier with a larger manpower number. This would require the division of staff to 2 or more shifts both by day and by week. There would also usually have to be a reduction in services provided for sustainability due to the reduced manpower. However, the strategy will also need to consider the separation of the radiographers, radiology nurses, patient service associates (PSA) / customer service officers (CSO) and ancillary staff, as well as administrative and IT personnel.

Interventional radiology/cardiology (IR/IC) departments or services should split temporally into 2 or more teams. Consider time gap in-between sessions/shifts and extend operating hours if needed.



Spatial segregation:

Departments with more modest manpower may consider spatial/physical segregation into well-defined teams. As much as possible, the teams should comprise multiple sub-specialty capabilities, seniority and experience. Interactions between the teams should be kept to a minimum as much as possible. Generally, radiologists (senior and junior teams) are easily managed this way. From the survey provided by radiology HODs in Singapore, most departments are split into 2 teams, some with 3 teams, and IR departments/ services into 2 teams.

Spatial separation allows for all manpower available to work and to maintain full service. If the department is decentralised, with adequate workstations in physically different locations in the hospital (e.g. inpatient, outpatient, satellite centers), radiologists can be assigned fixed working locations, depending on location of equipment and subspecialty skills required.

A centralised department may be segregated by physical barriers such as office partitions, with separate entrances and exits. Suitable alternative locations should be sought to separate and distribute reporting stations within the centralised department. Considerations include availability of network points, power outlets, adjustable lighting, noise control and isolation in administrative or non-clinical spaces.

Another alternative method of spatial separation would be to allow radiologists to work from home. This has its own challenges such as providing hardware and monitors with adequate resolution, remote access via VPN with sufficient speed, and co-ordination of worklist or cases to be reported. Some departments have tested and readied their home reporting system, to be activated as needed.

Composition of teams:

Each team should maintain a full range of expertise with even distribution of sub-specialists and by seniority. Residents, trainees and MOPEX medical officers to be evenly split as well.

Identify team leads and co-leads for each team, to provide leadership, oversight and a chain of command, as well as for communication and information distribution. Senior managers and radiologists should aim to disseminate such information and guidelines to the modality lead radiographers, the radiology subspecialty chiefs and the senior nurses/nurse clinicians in the department for them to in turn inform the staff under them.

Intra-department interactions:

Interactions between radiologists, radiographers and other staff of the department should be minimised, and non-physical forms of communication should be employed. Sharing of messages and images can be done through electronic notes on RIS and annotated images on PACS and the hospital/institution secure messaging system.

Teams separated by spatial segregation should not meet. Department activities such as large-scale meetings to be cancelled, and Information which was to be discussed at such meeting be disseminated by alternative means such as email or text messaging. Essential face-to-face meetings may be held, only in small groups, in a large venue with widely spaced seating, as close contact is defined being within a distance of 2 meters.

Department pantries will need to be modified by removing seating, with adequate separation in between, in a similar manner, to reduce both the degree and duration of contact, as surgical masks will need to be removed to eat. Other measures would include staggering meal breaks and ensuring adequate ventilation, by opening windows if possible. Toilet facilities and changing rooms to be designated for separate teams if possible.

Extra-department interactions:

Restriction of movement of healthcare workers (HCW) between hospitals are in place (MOH circular 60/2020 dated 27 February 2020). All visiting radiologist consultant sessions should be suspended.

Clinical rounds and multidisciplinary meetings may be cancelled or curtailed. Case discussions may take place on a per-clinical-need basis in small groups only. Telephone conversations if possible. Technical challenges in use of teleconferencing due to internet separation in Singapore can be resolved with Internet access laptops running platforms like Webex, Zoom, Microsoft Teams, etc.

Reduce contact with social distancing by minimising social gatherings of HCW outside of office hours. This may not be possible to enforce fully, as the immediate family of some staff may be working in the same or different hospitals.

Other radiology staff:

The need or capacity to separate the radiographers will depend on their roles and the manpower available. Reduce interactions between radiographers of different modalities and eliminate or minimise cross-modality coverage if possible. Temporal separation can be performed if manpower allows adequate rostering for service provision.

Staff may be redeployed to man critical areas of need, for example, Emergency Departments will require more radiographers for general radiography to cope with the expected increased workload, such as increased screening chest radiographs in the COVID-19 situation.

MRI, CT and US radiographer teams may then find themselves reduced in numbers and still having to provide full or reduced service. Separation into active and passive teams or outpatient and inpatient teams are possible options.

Radiology nurses can be similarly separated into active and passive teams, inpatient and outpatient sections, interventional section or diagnostic section.

Similarly, the PSAs/CSOs, HCAs and portering staff should be separated if possible. PSAs/CSOs can be separated into front counter and backroom groups, and backroom staff may be physically offsite to a call centre. HCAs and portering staff can be rostered by area of service and/or segregated by shift.

Communications and feedback:

Regular and directed communications of the evolving situation is important to ensure that all staff are updated with the most current information and operations guidelines from the hospital. Lack of proper information can lead to speculation which can affect morale and confidence in the leadership. This is particularly important in the early stages of the outbreak, when there can be much uncertainty, for example, in the classification of suspect cases or what level of PPE to use. When there is a lack or even a perceived lack of confidence in the leadership, the staff may become jittery and ill-disciplined, which in turn may affect the quality of their work or handling of patients. In extreme cases, radiographers may perform unsanctioned imaging on themselves if they fear they have been exposed or have possible infection.

All sections of the Department should regularly review their plans and adjust accordingly where a gap is noted or when the situation evolves. Smaller departments, which are nimbler and more flexible, may find this easier to do. Consensus decisions or agreements on changes are encouraged as they are generally better accepted by the rest of the department staff. Senior managers and heads of department should communicate any changes in a clear and concise manner to the rest of the staff.



Logistics:

Resources like portable imaging equipment, monitoring equipment, PPE, stores and the like should be secured and rationed. Usage of stocks should be made prudent and rational.

Excessive usage or wastage should be discouraged if not clinically required. Clear guidelines for such equipment and stocks should be issued and refined as required. Accountability and stock-taking should be reinforced to reduce improper or non-clinical / personal use.

Review available stocks of radiologic contrast media and all other drugs and medications needed for daily use. Radionuclide and radiopharmaceuticals supply may be affected by a prolonged shutdown and careful rationing may be needed.

Training & education:

Residents & trainees continue to have teaching sessions in hospital within their own teams. Cross cluster and inter-hospital sessions transferred to online or electronic platforms, possibly utilising video-conferencing. The (National) Radiology Residency R4 lecture series will migrate to an electronic format from March 2020, using WebEx with support from the SingHealth Radiology Residency Programme Office.

Inter-institution radiology residency rotations have been suspended. Subspecialty/modality training is to be maintained within the hospital following the original schedule as far as possible. Attendance at overseas conferences have been cancelled. Pre-approved leave before the outbreak may be allowed if manpower permits and following MOH Directives.

Interventional radiology considerations:

Most departments have single location for IR services and may be unable to segregate spatially. In addition, there may also be only a single unit/room which has certain capabilities (e.g. CT-fluoroscopy, neuro-interventional requirements). Utilising temporal segregation will result in halving of both manpower and capabilities, which will require some degree of adjustment and perhaps reduction in services.

Some elective outpatient cases can be rescheduled, e.g. nerve root blocks and FNACs. There will also be reduced nursing support for services such as nuclear medicine, fluoroscopy and IV cannulation.

Creative assignment and team composition will help to cater for backup for emergency cases. Interventionists to be segregated from diagnostic radiologists as far as possible. There may be impact on the rest of department when interventionists also function as diagnostic radiologists in some of their sessions.



Business continuity:

Departments should incorporate disaster planning and business continuity contingency plans into their layout and design. Consider pre-emptive provision of reserve PACS network points at the design phase, to be installed in the meeting rooms, administrative areas and conference room for rapid redeployment of PACS reporting workstations in the event one area/zone is taken out of active use due to contamination.

Sustainability in the medium to long term is essential in a prolonged outbreak. In the event of increase in severity of outbreak, reduction of services is inevitable. Outpatient services may be cancelled to divert resources to inpatient and emergency care. Critical services to be maintained must be identified. Hierarchy of services (electives vs inpatients vs isolation patients) to be listed and scaled down accordingly. Contingencies should be made for “one team down” scenario.

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