

## Interventional Radiology Preparedness in the Time of the COVID-19 Pandemic: Is there a Gold Standard?

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The Coronavirus disease 2019 (COVID-19) pandemic has continued to worsen and has reached a scale that has not been seen since the Spanish Flu pandemic over a hundred years ago in 1918 [1]. As of 15 Apr 2020, there are more than 1.9 million cases with more than 125 000 deaths worldwide [2]. Health care worker (HCW) infections resulting from caring and treating COVID-19 patients have also occurred in large numbers in some countries and many have perished [3, 4]. Protecting patients and HCWs from getting infected while maintaining high-quality care are key considerations for any interventional radiology (IR) service during this pandemic.

Since the outbreak, several manuscripts, guidelines and checklists on IR preparedness and COVID-19 have been published [5–18]. Many IR webinars on COVID-19 have also been broadcasted. This rapid sharing of information, experiences and best practices is unprecedented and bodes well for our specialty. It has undoubtedly helped many IR services throughout the world to prepare and deal with the COVID-19 pandemic.

The principles of managing a highly infectious disease with significant morbidity and mortality like COVID-19 are universal. Strict adherence to hand hygiene practices, proper use of appropriate personal protective equipment (PPE) and implementation of team segregation and social distancing are critical in preventing intra-hospital transmission and cross-infection of patients and HCWs. Other

strategies to minimise cross-transmission include segregating patients of different infection risks, identifying and isolating COVID-19 patients early and minimising their movement, and when necessary, performing procedures for COVID-19 patients either at the bedside or in pre-designated interventional suites. It is therefore important to have detailed, well-rehearsed IR protocols for dealing with COVID-19 patients, as described by many of these publications. While these principles are universal, they may not be uniformly implementable due to local constraints like PPE supply or the extent of the COVID-19 load within the institution. Hence each IR service may have to modify their protocols to cater to their own unique circumstances.

The N95/FFP 2/3 mask is generally recommended when coming in close contact with COVID-19 patients. There are reports of inadvertent exposure of HCWs wearing only surgical masks to undiagnosed COVID-19 patients, with no transmission to the HCWs [19]. This suggests that surgical masks may confer adequate protection and offers reassurance to IR services where there are shortages of N95/FFP 2/3 masks. There are also controversies with regards to the use of powered air-purifying respirators (PAPR) when performing aerosol-generating procedures (AGP) in COVID-19 patients. Existing WHO guidelines for performing AGPs in patients with airborne infections are N95/FFP 2 mask and eye protection (goggles or face shield) [20], but many institutions have adopted PAPR when performing AGPs in COVID-19 patients. This enhanced measure is not evidence-based but is understandable in the light of the knowledge gap concerning COVID-19. PAPRs are also not widely available and would not be universally deployed in every IR service.

Depending on the extent of local community spread of COVID-19, it is quite possible that HCWs can contract the

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infection in the community rather than in the hospital. Coupled with the possibility of pre-symptomatic spread [21, 22], it is prudent for all HCWs to don surgical masks while at work to minimise the risk of HCW to HCW transmission. Social distancing measures like minimising face to face meetings and sitting alone or widely apart during meals will also go a long way to prevent cross-transmission among HCWs.

Ultimately, it will be adoption of the whole slew of measures by everyone in the team that will ensure the protection of members of the IR service and their patients.

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#### Compliance with Ethical Standards

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