

# Emerging Attack and Management Strategies for Nuclear Medicine in Responding to COVID-19—ACNM Member Experience and Advice

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**Abstract:** As the World Health Organization declared COVID-19 as “global pandemic,” it is important for everyone, including nuclear medicine personnel, to know how to stop transmission, contain, and prevent the spread of COVID-19. We reach out to our ACNM (American College of Nuclear Medicine) international members from Wuhan, China and Singapore, who have participated in dealing with COVID-19 for the last 2 months, to learn from their lessons and experiences, so to provide advice to all ACNM members for their clinical practice and management strategies in responding to COVID-19.

**Key Words:** COVID-19, nuclear medicine, prevention, viral transmission

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An ongoing outbreak of the novel coronavirus disease 2019 (COVID-19), which was first identified in Wuhan, China, in December 2019,<sup>1–3</sup> is evolving into an international public health emergency. As of March 11, 2020, the World Health Organization has declared the COVID-19 a global “pandemic,” with a total of more than 120,000 cases in 114 countries including 4373 deaths.<sup>4</sup> Although the COVID-19 is slowing down and seems under control in China, the cases outside China have risen 13-fold rapidly, with Italy expanding COVID-19 lockdown to the whole country and reporting more than 10,000 cases and 631 deaths. Although the first case was just detected on January 19, 2020,<sup>5</sup> the United States now has more than 1000 infected people and 29 deaths in less than 2 months.<sup>6</sup> The virus can spread from person to person very quickly through respiratory droplets, but also through community spread and asymptomatic infected patients.<sup>7</sup> To protect and save lives, given the very real pandemic threat of COVID-19, it is important for everyone including nuclear medicine personnel to know how to stop transmission, contain, and prevent the spread of COVID-19.

The American College of Nuclear Medicine (ACNM) membership mainly consists of nuclear medicine physicians from the United States and other countries including China. We reach out to our ACNM international members from Wuhan, China and Singapore, who have participated in dealing with COVID-19 for

the last 2 months, to learn from their lessons and experiences,<sup>8–12</sup> so to provide advice to all ACNM members for their clinical practice and management strategies in responding to COVID-19.

First, be adherent to institutional and/or the World Health Organization’s infection prevention and control recommendation, and be alert to people who have COVID-19–related symptoms and clinical features.<sup>1,3,13</sup> When in contact with the suspected patients or visitors, nuclear medicine staff should maintain at least 3 feet of distance, wear masks, and be mindful of hand hygiene. Before the COVID-19 got detected and known to the public, a later confirmed COVID-19 patient presented to a nuclear medicine department for FDG PET/CT examination in Wuhan.<sup>11</sup> The nuclear medicine staff and physicians were wearing masks and washed their hands frequently as routine. Fortunate enough, none of the nuclear medicine personnel got infected despite close contact with this COVID-19 patient. So is the situation in other 4 highly suspected COVID-19 cases in another PET/CT center in Wuhan.<sup>10</sup>

Second, temporarily change routine clinical nuclear medicine practice to minimize the risk of infection for nuclear medicine personnel and patients. Measures can be considered as follows: (1) reschedule and postpone outpatient nuclear medicine and PET/CT tests whenever possible; (2) temporarily reject procedures and scans that bear high risk of respiratory communications and can be substituted or postponed, such as VQ scan and urea breath test; (3) change scan protocols to minimize frequency and duration of patient hospital visit to reduce potential contact exposure (for example, use shorter scanning time for SPECT/CT, avoid unnecessary delayed time point or multiday images, and convert any 2-day myocardial perfusion test to 1 day protocol); (4) limit visitors to one adult at a time (visitors must be aged 18 years or older to enter and must pass screening questions and must not have any respiratory viral symptoms; screening assessment likely will include temperature assessment of all patients and visitors to clinical areas); and (5) one person to the end policy—in case of any suspected or confirmed case for scan or any procedure, change of nurse or technician in the middle of the procedure is not allowed.

Third, temporarily change academic routine: switch all weekly teachings, peer review learnings, and tumor board meetings to online virtual meeting by using Zoom or Webex, and so on; cancel all the planned domestic and international business and personal travel when possible.

Fourth, there should be segregation of nuclear medicine physicians and staff, as well as inpatients and outpatients so that there is as little as possible cross exposure risks. The onsite team stays in the main department and is responsible for all patient contacts including radiotracer administration, patient interview, and consultation; the team should be further separated into outpatient and inpatient groups; the offsite team stays away from patient contact, works from individual office or home, reads scans, participates in online tumor boards, provides telemedicine, and provides online consultation to referring physicians and patients. The 2 teams are prohibited from having any direct contact. There should be a fixed, designated physician to cover the service in each satellite site to minimize

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possible interinstitutional transmission. The rotation should be every 14 days. Ideally, there should be COVID-19 test for onsite team members at the end of rotation. If intrahospital transmission occurs, this approach would avoid shutdown of the entire department should quarantine be required.

Lastly, if there are suspected CT and/or PET/CT findings of COVID-19 infection<sup>10,11,14-16</sup> identified by a nuclear medicine physician, the institutional COVID-19 team should be informed immediately, and the suspected patient and visitors, as well as the nuclear medicine personnel who have been in contact with this patient, should be noticed, quarantined, and treated accordingly.

The above measures have been proactively and progressively implemented in our ACNM members' departments since the onset of the COVID-19 outbreak in China and Singapore, and now adopted in the United States. There has been no single nuclear medicine personnel who got infected by COVID-19 in the authors' nuclear medicine departments. We recommend the ACNM members to take references of these measures to make tailored institutional approaches in terms of planning for screening, rapid testing, and isolation and treatment procedures based on the available local resources.

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