

Radiologic Technologists and Their Part in Diagnosing COVID-19

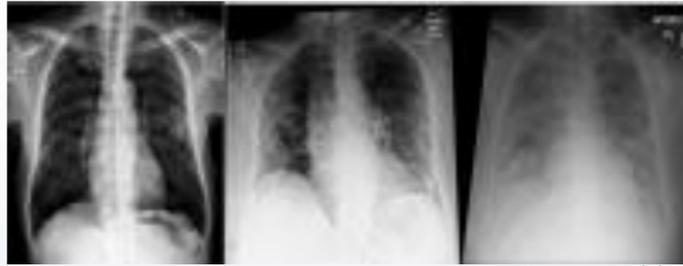


Figure 1 (1)

Introduction

COVID-19 has been a major medical event in this last year (2020) and will continue to be a real challenge in the coming years. As a part of the Radiologic Technologist team, we handle many COVID-19 patients. With the use of imaging, we are part of the frontline in diagnosis of the virus from this pandemic. As technologists, we assess body habitus, gesture, shape and/or the condition they are in. We also get to see their exams and the effects the virus has on their bodies, especially the lungs. Examples are shown in Figure's 1 and 3.

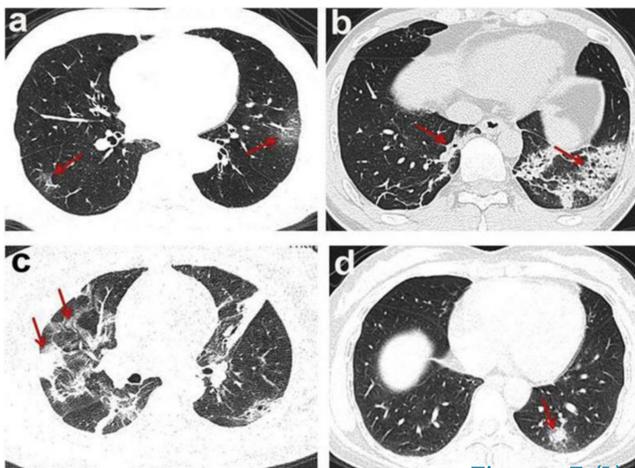


Figure 3 (1)

COVID-19 Symptoms

Typical clinical symptoms associated with the Covid-19 disease include cough, fever, fatigue and dyspnea. Many patients can develop nausea and diarrhea, as well as generalized muscular pain and lack of smell or taste. However, for a significant minority of cases, Covid-19 can present as, or progress to, severe respiratory distress.¹

Methodology

Radiologic Technologists take part in the care and diagnosis of COVID-19 in patients. There are multiple ways to diagnose COVID-19 which include swabs, blood tests and imaging, such as chest radiographs, chest CT, lung ultrasound, as well as MRI. Medical imaging may be useful for differential diagnosis between COVID-19 and other viral respiratory illnesses with similar symptoms.¹ The radiologists, along with the doctors, monitor the changes and appearances in the patient's lungs making notes of progressions. It has been well-documented that chest radiographs should be the first-line imaging tool and chest CT should only be reserved for clinically ill patients, or when chest radiograph and clinical presentation may be inconclusive.¹

The effects of COVID-19 can range from mild to severe, even causing death for some. Imaging the patient's lungs helps to visualize the fullness of their lungs and helps to note the changes in the lungs. CT scans are a great way to see the growths in the patient's lungs and the location of the growths (See Figure 3). Unfortunately, CT scans are not done portably; you must transport the patient through the hallways and bring them into the scanning room. It is absolutely necessary to always keep a mask on the patient if possible. Having an air filter system in the imaging room will allow a quicker time for a different patient to enter this room afterwards. It is important to follow the timelines for your air filtering system as well as cleaning, to prevent the spread onto the next patient. The time needed to clean the air varies with each air filtering system.

Results

Chest x-rays help the radiologist in the diagnosis of COVID-19 by the appearance of the opacities. Chest x-rays allow the radiologist to differentiate different conditions such as COVID-19 and pneumonia, as well as the stage of the disease (See figure 1). X-rays can also help with the assessment of respiratory distress. The advantages of CXR include portability, which prevents cross-infection within radiology, cost-effectiveness, and a wider availability.¹ Again, extra precautions are necessary when turning to the CT Scan for a potential diagnosis. When performing a CT on a COVID-19 patient, increasing the air-exchange per hour or use a high-efficiency particulate air (HEPA) filtration in the exam rooms are potential supplemental mitigation measures.² When using the air-exchange system or HVAC system it is important to use the correct guidelines for the wait time to reuse that room again. Air exchange rates can vary per system, so it is extremely important to follow what your filtration time requires along with a thorough cleaning after the patient leaves the room. Downtime may be between 30 minutes to an hour to allow for room decontamination and passive air exchange.² Chest x-rays and chest CT's can be acquired at the time of infection and later as a follow up to monitor and compare the changes in opacities in the lung field. Many patients have lingering symptoms afterwards that may lead to continuous difficulties. Time will tell if there are lasting effects of COVID-19 on the lungs.

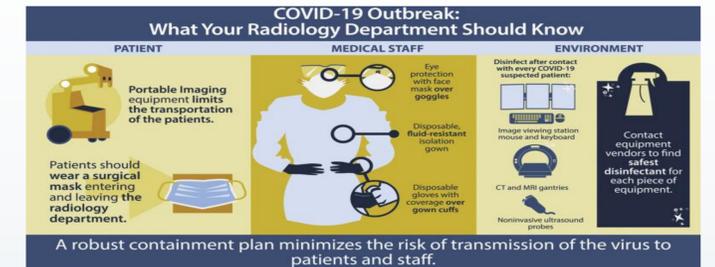


Figure 2 (1)

Conclusion

Imaging is a way to diagnose COVID-19, by providing optimal views of the chest with multiple modalities. Radiologic technologists can help prevent the spread of COVID-19 with the use of proper PPE, hand washing or gelling, using a portable x-ray machine and being sure to disinfect it after exiting the room. Always remember to provide adequate time for the filtering system to clean the air in each exam room between each patient. With proper attention given to cleanliness and social distancing, the spread of COVID-19 can be greatly diminished or stopped all together.

References

- (1) Stogiannos N, Fotopoulos D, Woznitza N, Malamateniou C. COVID-19 in the radiology department: What radiographers need to know. *Radiography (Lond)*. 2020;26(3):254-263. doi:10.1016/j.radi.2020.05.012.
- (2) Kwee TC, Author Affiliations From the Department of Radiology, Organization WH, et al. Chest CT in COVID-19: What the Radiologist Needs to Know. *RadioGraphics*. <https://pubs.rsna.org/doi/10.1148/rg.2020200159>. Published October 23, 2020. Accessed January 26, 2021.