

Singapore

On the lookout for white 'shadows': How Tan Tock Seng Hospital uses X-rays in the fight against COVID-19



Dr Terrence Hui, who is a senior resident at Tan Tock Seng Hospital (TTSH), poses for a photo. (Photo: TTSH)

By [Matthew Mohan \(/author/10386142\)](/author/10386142)

10 Aug 2020 06:04AM

(Updated: 10 Aug 2020 08:29PM)



Bookmark



SINGAPORE: When he studies the chest x-ray of a suspected COVID-19 patient, Dr Terrence Hui is looking for a number of telltale signs, one of which is the presence of white "shadows".

These white "shadows" are opacities in the lungs, which point to lower respiratory tract infection. This infection could mean the patient has COVID-19.

“When it (the SARS-CoV-2 virus) attacks the lungs, what happens is that it causes cells and fluid to fill up these air pockets,” said Dr Hui, who is a senior resident at Tan Tock Seng Hospital (TTSH).

“Because it's filled up, gases can't be exchanged - you can't exchange your carbon dioxide with your oxygen. And therefore it fails to function or serve its purpose ... And when we take an x-ray, all these fluid and cells appear as white shadows on the x-ray.”

For most COVID-19 patients, x-rays only reveal very small patches of white, said Dr Hui.

“That's why a lot of patients are asymptomatic, they don't really have any breathlessness or anything. Because the air will just go to other parts of the functional lungs,” he explained.

Advertisement

“But in a very small group of patients, the opacity starts to increase, that means more parts of the lungs are involved. And then that means the lungs would decompensate because it can't function properly.

► **[READ: Most events should remain virtual for now, even as more COVID-19 restrictions are eased: Gan Kim Yong \(/news/singapore/covid-19-singapore-events-remain-virtual-gan-kim-yong-12996258?cid=h3_referral_inarticlelinks_24082018_cna\)](/news/singapore/covid-19-singapore-events-remain-virtual-gan-kim-yong-12996258?cid=h3_referral_inarticlelinks_24082018_cna)**

“So what they will get is breathlessness, and then they need oxygen. In a very small group of patients, they even need intubation to help them to breathe.”

Research has shown that chest x-rays of patients who are severely ill with COVID-19 can reveal opacities which can cover more than 50 per cent of the lungs, said Dr Hui.

Opacities in the lungs are not specific to COVID-19 and can be observed in other viral and bacterial infections, noted Dr Hui. The final diagnosis of whether a patient has contracted COVID-19 will come from a swab test.



A radiographer wipes down a chest x-ray machine after use. (Photo: TTSH)

“Being able to differentiate the most serious from the mild cases is actually very useful, because it helps you triage - (a) sort of resource allocation - so ... you're using hospital resources to take care of the sicker patients,” explained Dr Hui.

Chest x-rays are also used to monitor the progress of COVID-19 patients admitted to the hospital, he added. The average COVID-19 patient undergoes three x-rays during their stay at Tan Tock Seng Hospital.

This could mean comparing the x-rays taken of a patient over various days to see how the individual is coping.

“It’s used to monitor the progress ... because it guides management. So if this patient is worsening, there are more white shadows, then you want to maybe give oxygen earlier on so the patient doesn't need to feel unwell, feel like he's breathless before he gets the oxygen,” said Dr Hui.

DEALING WITH RISKS

 There are over 300 staff at the hospital's department of diagnostic radiology. This is made up of radiographers and radiologists as well as nurses, radiographer assistants, admin and ancillary staff.

Radiographers perform x-rays on patients and work in three rotating shifts round the clock.

Radiologists, who are specialist doctors, access and view these images electronically, before coming up with clinical reports.

Currently, about 200 x-rays are conducted daily for suspected and confirmed COVID-19 patients, said Mr Surender Naini Reddy, who is TTSH's Head of Radiography Services and Principal Radiographer. This number was as high as about 500 per day during the peak of the pandemic in March.

In addition to handling suspected and confirmed COVID-19 patients, the hospital's "business as usual" operations also continue, and x-rays and CT scans are used in other scenarios.

Mr Reddy's role sees him involved in a number tasks including management of day-to-day radiography operations, training of staff and ensuring the well being of the radiographers and ancillary staff in the department.

Mr Surender Naini Reddy, who is TTSH's Head of Radiography Services and Principal Radiographer, interacts with a radiographer. (Photo: TTSH)

A trained radiographer, Mr Reddy has worked at the hospital for over 25 years, and seen a number of outbreaks such as Severe Acute Respiratory Syndrome (SARS) and H1N1 come and go.

“The scale of the COVID-19 pandemic has surpassed SARS, H1N1 and Ebola. It’s much bigger and the duration also is much longer,” he said.

“But thankfully we have a newly opened NCID (National Center for Infectious Diseases), built specifically to combat such an outbreak. So during the previous SARS time, we did not have an NCID. So that is a difference.”

Suspected cases of COVID-19 undergo a “structured” screening process at the NCID screening centre, **said** Mr Reddy.

“They have a structured screening process there, this includes when the patient enters into the NCID screening center - their detailed history will be taken - (for) example, physical examination, travel history, then they do the swab test. Then after, (the patient is) sent for an x-ray,” he added.

It takes a few minutes for a radiographer to take an x-ray and that would be electronically uploaded to a server. A radiologist will have access to the digital x-ray and a clinical diagnosis will be made within 30 mins to one hour.

► **[READ: Singaporeans, PRs who travel from permitted countries can tap subsidies, MediShield Life for COVID-19 hospital bill \(/news/singapore/covid-19-singaporean-pr-travel-medishield-life-hospitalisation-12996194?cid=h3_referral_inarticlelinks_24082018_cna\)](#)**

“Now with the online technologies, we do not have to touch x-ray films, we have less touch points,” said Mr Reddy. “Now, everything is digital.”

As radiographers come into contact with suspected and confirmed COVID-19 patients when they perform x-rays, there is also a need for added precaution, said Mr Reddy.

“The risk is real because they will be directly (in) contact with the patients, but we do wear full PPE (personal protective equipment), so we are well protected,” he said. “The risk is very minimal because we take care of ourselves, (by) wearing the goggles, wearing the mask and (there is the) cleaning of the equipment.”

Staff also have been trained on how to work in the midst of a situation such as this, said Mr Reddy.

“So from the beginning of our career(s), we've been trained how to handle the patients in isolation rooms, how to wear the PPE, how to protect ourselves,” he said. “So we know as long as you follow the correct infection control protocols, we are very safe.”

Source: CNA/mt

Tagged Topics

[COVID-19](https://www.channelnewsasia.com/news/topic/covid-19) (<https://www.channelnewsasia.com/news/topic/covid-19>).

[x-ray](https://www.channelnewsasia.com/news/topic/x-ray) (<https://www.channelnewsasia.com/news/topic/x-ray>), [hospital](https://www.channelnewsasia.com/news/topic/hospital) (<https://www.channelnewsasia.com/news/topic/hospital>).

[doctor](https://www.channelnewsasia.com/news/topic/doctor) (<https://www.channelnewsasia.com/news/topic/doctor>).

Bookmark





BREAKING NEWS ALERTS

Be among the first to know about COVID-19 updates and other breaking news in Singapore and the world.

Copyright© Mediacorp 2020. Mediacorp Pte Ltd. All rights reserved.

