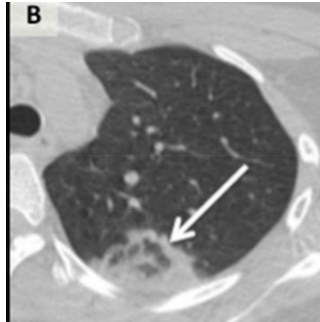


## Chest CT Scans Probe COVID-19 Symptoms



Chest CT plays an important role in the diagnosis of patients with suspected coronavirus disease-19 (COVID-19) infection. In a new study, researchers from [Icahn School of Medicine at Mount Sinai, New York](#), and their counterparts in China, reviewed chest CTs of 121 COVID-19 patients for common CT findings in relationship to the time between symptom onset and the initial CT scan.

You might also like: [RSNA Launches Free Diagnostic COVID-19 Community Resource](#)

Their findings show that a pattern of ground-glass and consolidative pulmonary opacities, often with a bilateral and peripheral lung distribution, is emerging as the chest CT hallmark of COVID-19 infection.

### Materials and Methods

This retrospective study covered 121 adult patients admitted to four hospitals in [four provinces in China with confirmed COVID-19](#) from 18 January to 2 February 2020. Patient selection was consecutive in each of the four institutions, but those below 18 years of age were excluded. Travel and exposure history of each patient was also recorded.

All patients were positive for COVID-19 via laboratory testing with real-time reverse transcriptase polymerase chain reaction (rRT-PCR) of respiratory secretions obtained by bronchoalveolar lavage, endotracheal aspirate, nasopharyngeal swab, or oropharyngeal swab.

The amount of time between the initial appearance of patient symptoms (such as fever, cough, etc.) and the date of both the first positive rRT-PCR test as well as the date of the initial chest CT examination were noted for each patient.

### Results

The time between initial onset of symptoms and subsequent chest CT was known for 94 patients and assigned as early (0-2 days), 36 patients; intermediate (3-5 days), 33 patients; or late (6-12 days), 25 patients. Analyses of chest CT findings showed the "hallmarks" of COVID-19 infection on imaging were bilateral and peripheral ground-glass and consolidative pulmonary opacities.

Notably, 20/36 (56%) of early patients had a normal CT. With a longer time after the onset of symptoms, CT findings were more frequent, including consolidation, bilateral and peripheral disease, greater total lung involvement, linear opacities, "crazy-paving" pattern and the "reverse halo" sign. In addition, bilateral lung involvement was observed in 10/36 early patients (28%), 25/33 intermediate patients (76%), and 22/25 late patients (88%).

### Discussion and Conclusion

Only one of the patients in the early group had an initially negative rRT-PCR result, suggesting that rRT-PCR is positive even in patients with normal chest CT. Chest CT therefore has limited sensitivity and negative predictive value early after symptom onset, which means this modality is unlikely a reliable standalone tool to rule out [COVID-19 infection](#).

This study shows that frequency of CT findings is related to infection time course. Recognising imaging patterns based on infection time course can help clinicians and researchers in two ways: 1) Understand the pathophysiology and natural history of infection; and 2) Predict patient progression and potential complication development.

Since the virus outbreak is at a stage of evolving from the acute to a more subacute phase in many patients, future studies may evaluate imaging findings in chronic patients. Such work could evaluate if long-term complications absent in this study (such as pleural effusions, empyema, lymphadenopathy, and lung cavitation) potentially arise.

Source: [RSNA](#)  
Image credit: Radiology

reference Bernheim A, Mei X, Chung M et al. (2020) Chest CT Findings in Coronavirus Disease-19 (COVID-19): Relationship to Duration of Infection. Radiology; Published Online: 20 February. <https://doi.org/10.1148/radiol.2020200463>

