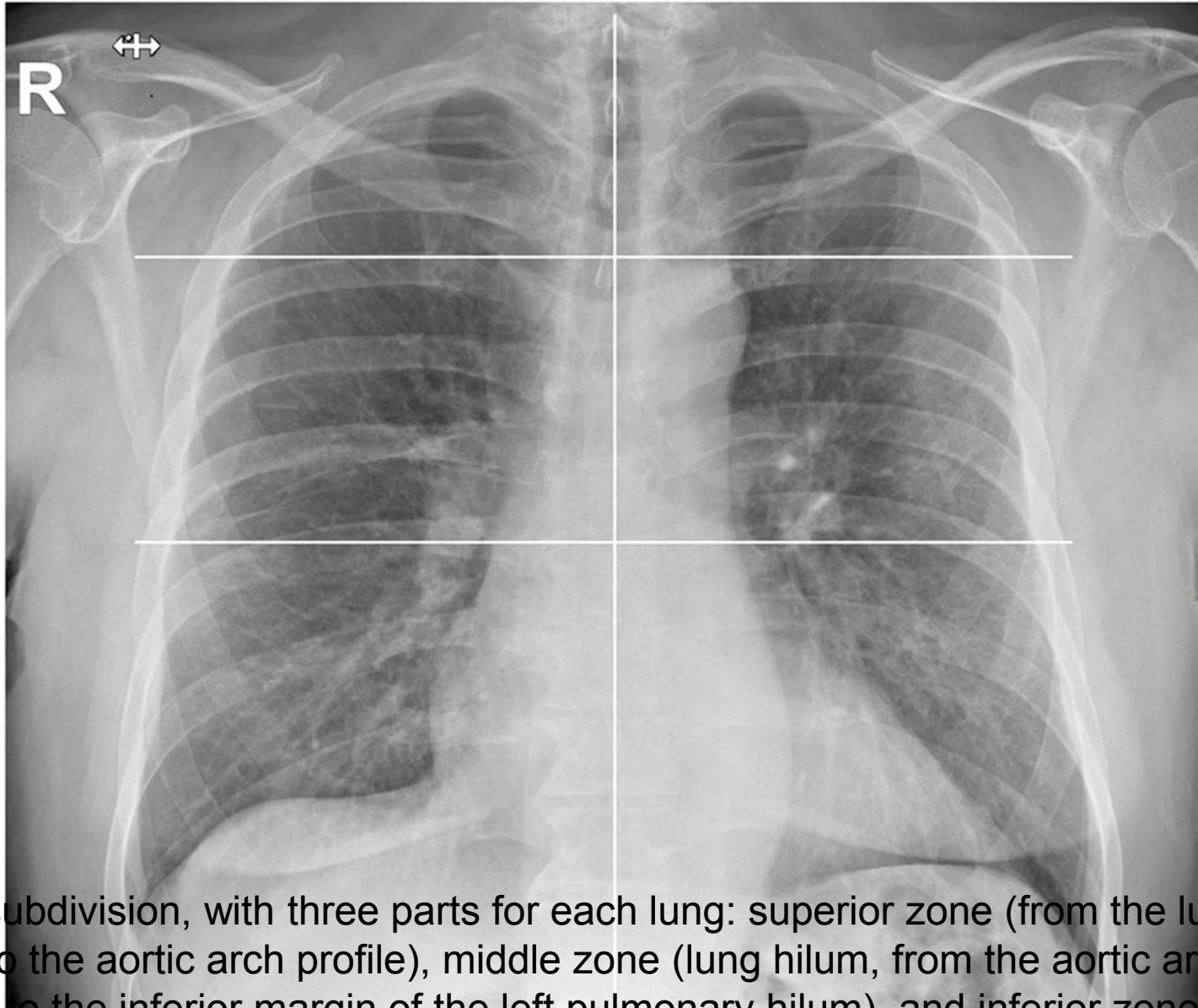


**Chest x-ray severity score in
COVID-19 patients on
emergency department
admission: a two-centre study**



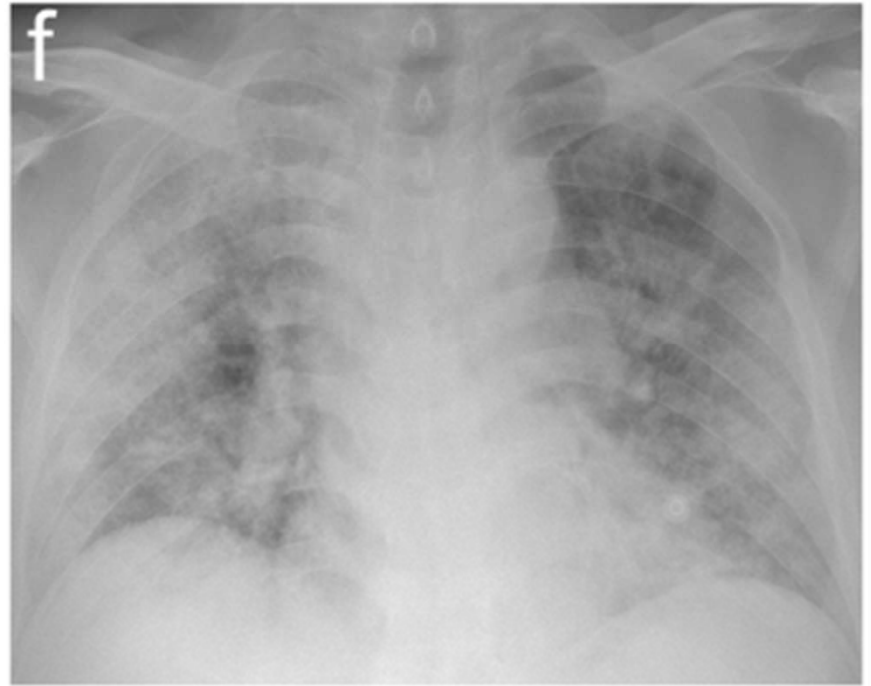
CXR subdivision, with three parts for each lung: superior zone (from the lung apex to the aortic arch profile), middle zone (lung hilum, from the aortic arch profile to the inferior margin of the left pulmonary hilum), and inferior zone (from the inferior margin of the left pulmonary hilum to the diaphragm)



The CXR score for each patient was (upper zones R-L; middle zones R-L; lower zones R-L): **a** 0-0, 0-0, 1-1 (total 2); **b** 0-0, 2-2, 1-1 (total 6);



c 1-1, 2-3, 2-3 (total 12); **d** 1-1, 2-2, 2-2 (total 10);



e 2-2, 3-3, 3-3 (total 16); **f** 3-1, 3-3, 3-3 (total 17)

RESULT

- As of June 30, 2020, after a median follow-up length of 104 days (IQR 100–109 days), censoring was applied, recording 58 deaths during hospitalisation; these patients had a significantly higher median CXR severity score on admission (16.5, IQR 13–20) than surviving patients (15, IQR 13–16, $p = 0.003$), being also significantly older ($p < 0.001$) than surviving patients (median age 76 years with IQR 70–83 years, and median age 66 years with IQR 55–75 years, respectively).
- Overall, median CXR severity score was 8 (IQR 6–11), without any significant difference between men and women ($p = 0.758$), showing however a significant but weak correlation with age ($\rho = 0.177$, $p = 0.002$).

RESULT

- Correlation between CXR severity score and clinical data
- Median CXR severity score showed weak correlations with clinical data, in particular significant negative correlations with SpO₂ on ED admission ($\rho = -0.242$, $p < 0.001$), lymphocytes ($\rho = -0.162$, $p = 0.005$), and PaO₂ at blood gas analysis ($\rho = -0.203$, $p = 0.004$), significant positive correlations with total white blood cell count ($\rho = 0.277$, $p < 0.001$), platelets ($\rho = 0.161$, $p = 0.006$), lactate dehydrogenase ($\rho = 0.308$, $p < 0.001$), and C-reactive protein values ($\rho = 0.367$, $p < 0.001$). Among other arterial blood gas values on ED admission, none except lactate levels ($\rho = 0.257$, $p < 0.001$) showed a significant correlation with CXR severity score: pH ($\rho = 0.129$, $p = 0.060$), pCO₂ ($\rho = 0.031$, $p = 0.657$), HCO₃⁻ ($\rho = 0.028$, $p = 0.682$).

AI Tool Uses Chest X-Rays to Identify COVID-19 Patients Likely to Develop Life-Threatening Complications with 80% Accuracy

By Hospimedia International staff writers

Posted on 13 May 2021



Trained to see patterns by analyzing thousands of chest X-rays, a computer program predicted with up to 80% accuracy which patients with COVID-19 would develop life-threatening complications within four days.

Developed by researchers at NYU Grossman School of Medicine (New York, NY, USA), the program used several hundred gigabytes of data gleaned from 5,224 chest X-rays taken from 2,943 seriously ill patients infected with SARS-CoV-2, the virus behind the infections.

The authors of the study cited the “pressing need” for the ability to quickly predict which patients with COVID-19 are likely to have lethal complications so that treatment resources can best be matched to those at increased risk. For reasons not yet fully understood, the health of some patients with the disease suddenly worsens, requires intensive care, and increases their chances of dying. In a bid to address this need, the NYU Langone team fed not only X-ray information into their computer analysis, but also patients’ age, race, and gender, along with several vital signs and laboratory test results, including weight, body temperature, and blood immune cell levels. Also factored into their mathematical models, which can learn from examples, was the need for a mechanical ventilator and whether each patient survived (2,405) or died (538) from their infections.



Illustration