# Stepwise Evolution in Development of Radiology Guidelines during COVID 19 Pandemic

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Coronavirus disease (COVID-19) is a WHO-declared pandemic, since the first case was reported in China and has challenged all fields of medicine. At the time of this writing, the total number of diagnosed cases globally is above 8 million with more than 439,000 deaths. The role of radiology in COVID-19 is three-fold: diagnosis, progression and severity [1,2]. Progression and severity can be assessed in moderate to severe clinical scenarios. For mild symptoms in a patient with COVID-19, there is no role of imaging and isolation with observation is being suggested routinely. Although the progression and severity of disease can be assessed with arterial blood gases (ABGs), imaging like chest X-ray or CT scan, depending upon availability, can be used for assessment of the extent of pneumonic infiltrates[1-5].

Radiology role in diagnosis, progress, prognosis, management and screening of COVID-19 is known all over the world. The role of radiology has been well established in Chinese clinical pathways during the pandemic which have been advocating the use of CT scan particularly in recent publications in peer-reviewed high-impact factor journals. In comparison, its role in the West, both in USA and Europe, has been evolving that can be judged by the changing statements from the European, British and American radiological societies [7-9].

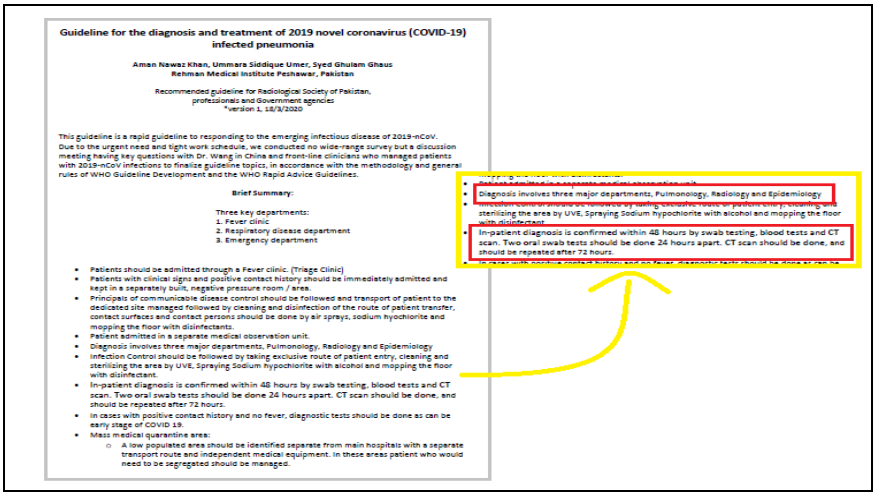
Many countries like China, few centers in UK and in Pakistan have been using Imaging like High resolution Computed Tomography (HRCT) scanning as screening tool. Use of Chest X-Ray (CXR) and CT scan is beneficial in assessing the stage, progress and prognosis of disease with CT being more sensitive as compared to CXR. Use of CT in triage, however has faced criticism not only from non-radiology but also from within the radiology family. RT-PCR (real time PCR) remains the gold standard for diagnosing COVID-19, but it can be false negative in 30% cases. In such cases, CT scan has a role to triage and pick out positive cases along with the stage of disease. Appearance of COVID-19 pneumonia is specific and is seen on CT scan and CXR as patchy areas of ground glass opacities or/and consolidations with a peripheral and basal predominance, interspersed areas of interstitial septal thickening with/without crazy paving. This finding has been seen previously as well, before the COVID-19 Pandemic, in cases with atypical infections, organizing pneumonias etc, which is the biggest critique from those speaking up against its use as screening tool.

Till now the role of imaging in Pakistan is limited mostly for progression and severity, and that too in selected cases [6,10]. Internationally, publications in different journals and online forums highlight the importance of CT scan as diagnostic tool. We from the forum of radiological society of Pakistan have been working on radiology guidelines since the start of pandemic in Pakistan (February 2020). Different versions have been made and put up for discussion and analysis. Website of RSP is being regularly updated with latest guidelines to help radiology community in fight against COVID-19 pandemic [11].

**18-03-2020 (Version 1):**

**CT inclusive in initial diagnostic workup** – We strongly recommended use of CT scan in the initial diagnostic workup for suspected COCID-19 along with swab test and epidemiology.

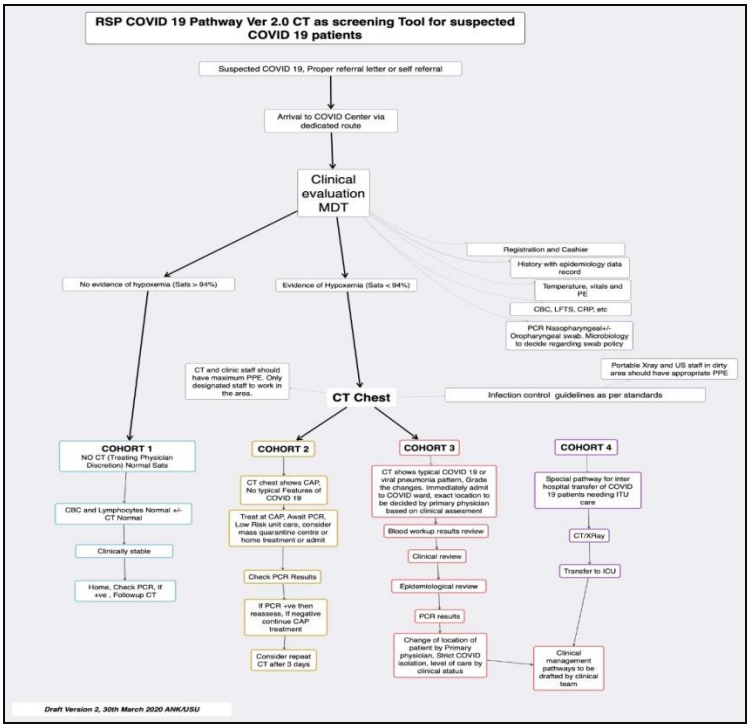
Fig1: Version 1 of proposed guidelines (18-03-2020).



**27-03-2020 (Version 2):**

**Role of imaging in diagnosis and triage:** There is enough evidence that CT can help diagnose, stage and prognosticate COVID 19 infection. In Chinese experience, CT (low dose non-contrast) was used as one of the preliminary test along with CBC and other blood tests. This has the benefit of triaging patients and following clinical pathways. If available, CT would be the best way of diagnosis and allocating a treatment pathway to patients with suspected COVID infection. RSP proposed pathway for clinical management of COVID patients is given below.

Fig 2: Version 2 of proposed guidelines and role of CT chest in COVID-19 pathway (30-03-2020)




**6th April 2020 (Critique of NIH Clinical Pathway):**

NIH uploaded clinical classification of suspected or confirmed COVID-19 on their website. Radiologists from RSP forum had suggestions for role of imaging in NIH Clinical Pathway, which were addressed to Government representative in an online zoom meeting through RSP forum. RSP also had suggestion on managing acutely unwell patients during COVID-19 pandemic.

Figure.3 Critique and suggestions for NIH pathway in COVID-19 management.

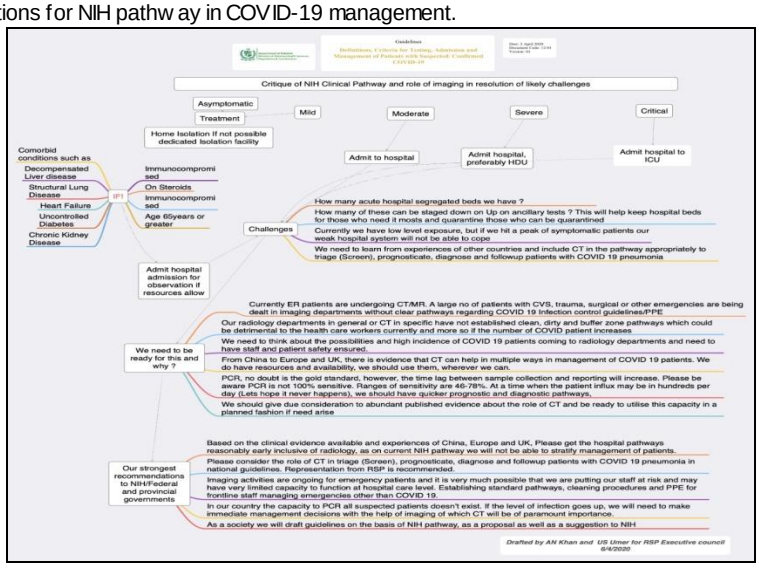



Figure 4: RSP recommendation for managing acutely unwell ER patients during COVID-19 Pandemic

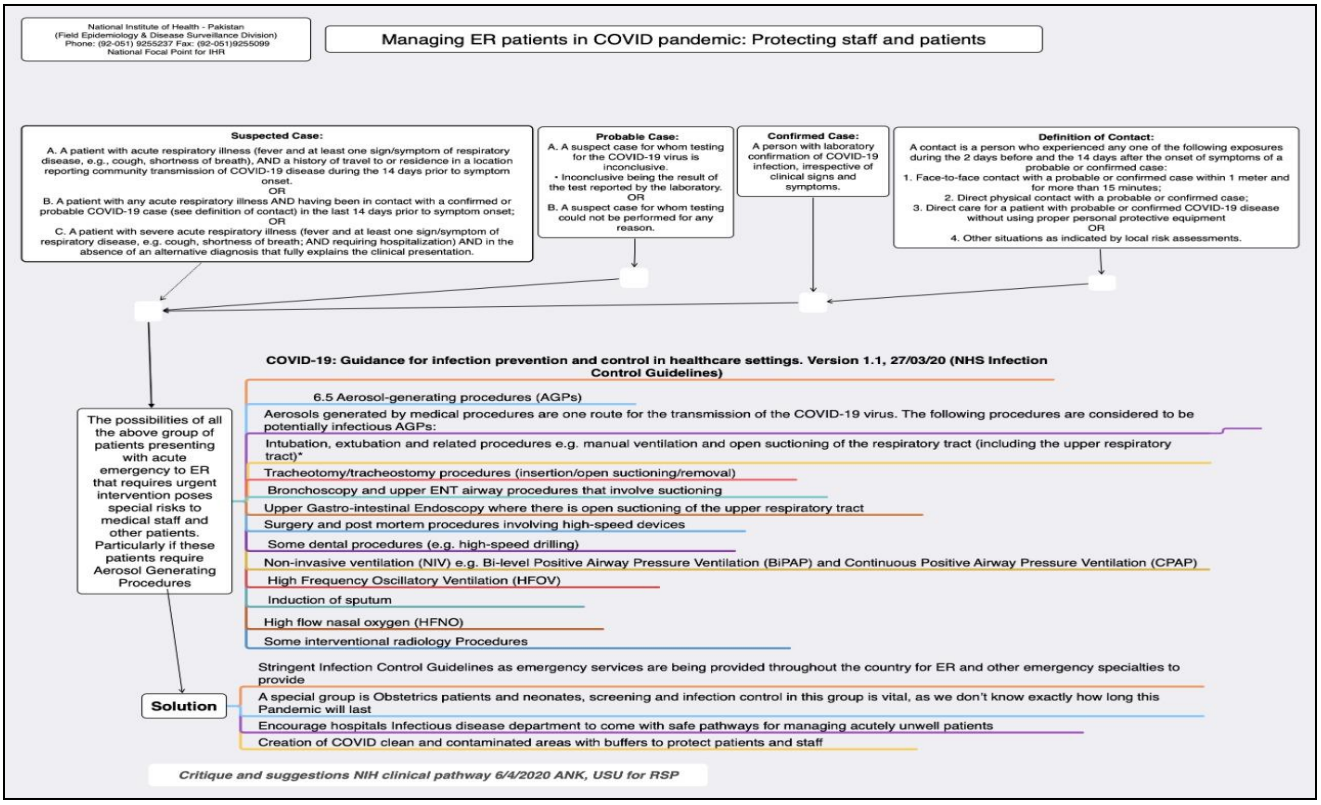
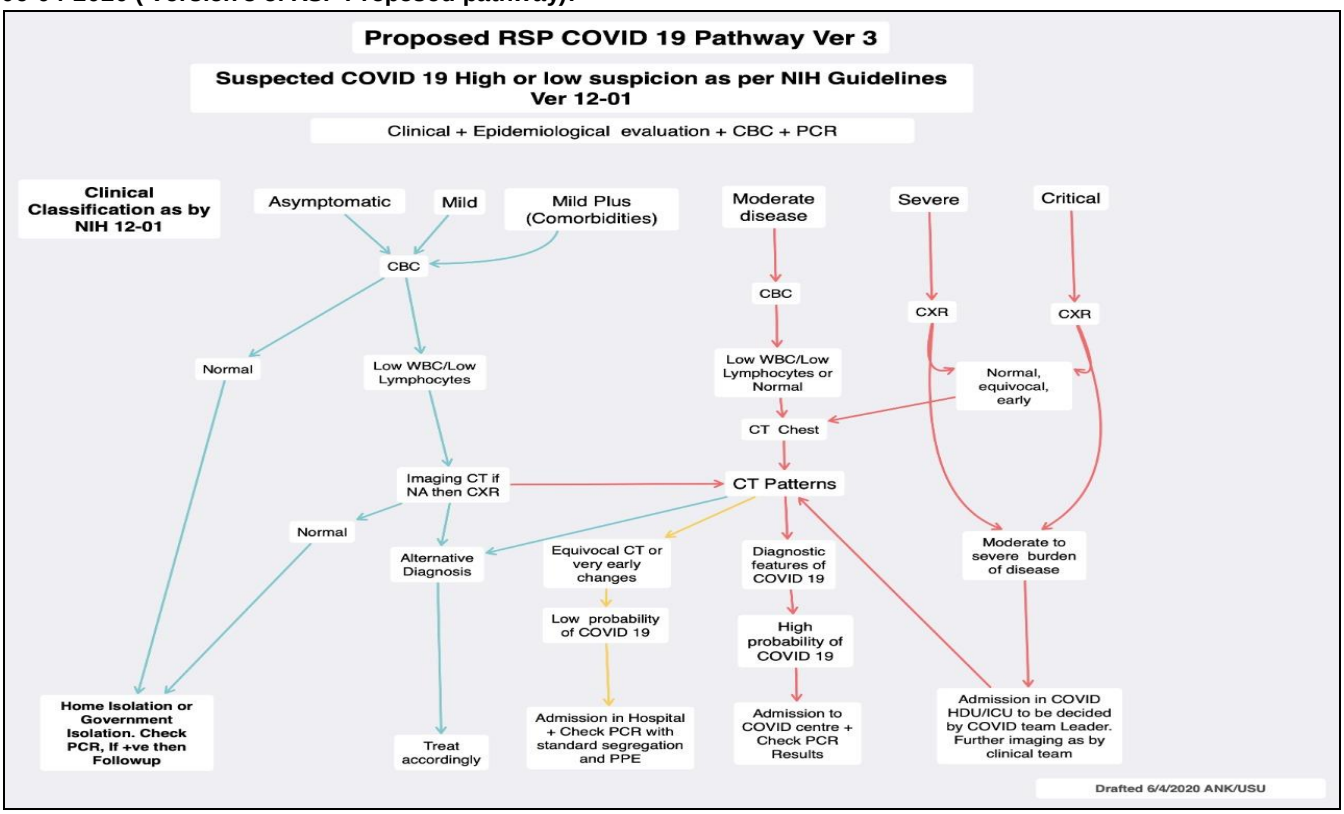


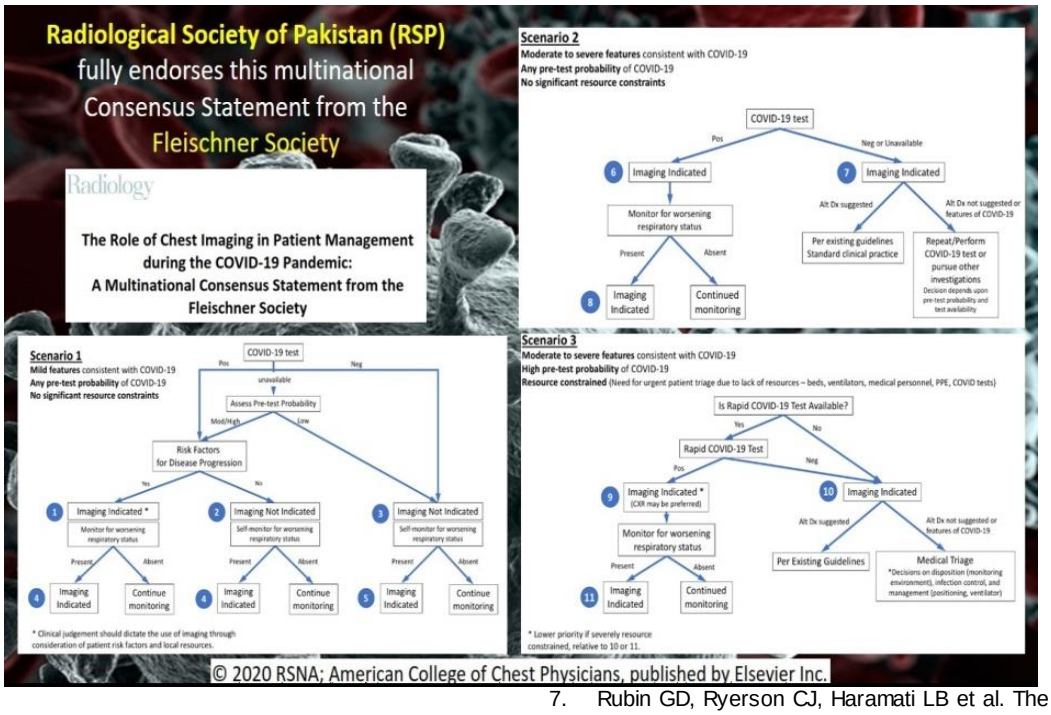

Figure.5 Version 3 of proposed RSP pathw ay for COVID-19 as per NIH guidelines (6th April 2020)

**06-04-2020 ( Version 3 of RSP Proposed pathway):**




**8th April 2020:**

Endorsement of Multinational Consensus statement from the Fleischner Society.

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