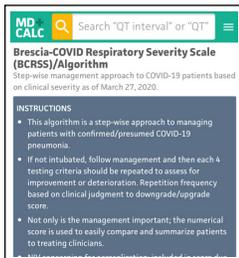# Calculated Decisions

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# Brescia-COVID Respiratory Severity Scale (BCRSS)/Algorithm

The Brescia-COVID respiratory severity scale/algorithm is a stepwise management approach to COVID-19 patients based on clinical severity; this information is current as of March 27, 2020.

## Points & Pearls

- The Brescia-COVID respiratory severity scale (BCRSS) and algorithm were rapidly developed in Brescia, Italy, during that nation's COVID-19 crisis. The scale has not been validated or tested in other populations and was developed as the world continued to learn more about COVID-19 each day.
- Clinicians in Brescia have been referring to COVID-19 patients by level number; in the intensive care unit, a patient's assigned level is taped above the bed and updated daily.
- Patients are also assigned a subscore using daily chest x-ray findings for further stratification. Three quadrants of each lung are each assigned a score of 0 to 3, with 0 points assigned for no opacification in the quadrant and 3 points for full opacification; the points assigned for each quadrant are then added together. For example, a patient at "Level 3 with 12 points on chest x-ray" would be in much more serious condition than a patient at "Level 3 with 2 points on chest x-ray."
- Many clinicians in North America have raised concerns about the risk of viral particle spread with the use of noninvasive ventilation and high flow nasal cannulas. The creators of the BCRSS in Italy included those ventilation strategies because they did not have enough ventilators to accommodate all of the patients who needed them, and the only alternative for those patients would have been death.

## Critical Actions

Patients with tachypnea and patients who require significant levels of oxygen or ventilatory support are at very high risk for clinical decompensation and death.

## Instructions

- The BCRSS/algorithm presents a stepwise approach to managing patients with confirmed or presumed COVID-19 pneumonia.
- If the patient is not intubated, follow management recommendations, then repeat each of the 4 testing criteria to assess for improvement or deterioration. Repetition frequency is based on clinical judgment to downgrade or upgrade the score.

### CALCULATOR REVIEW AUTHORS

**Andrea Duca, MD**
Emergency Department, Papa Giovanni XXIII Hospital, Bergamo, Italy

**Simone Piva, MD**
Department of Medical and Surgical Specialties, Radiological Sciences and Public Health, University of Brescia; Department of Anesthesia, Critical Care and Emergency, Spedali Civili University Hospital, Brescia, Italy

**Emanuele Focà, MD, PhD**
Division of Infectious and Tropical Diseases, Department of Clinical and Experimental Sciences, University of Brescia School of Medicine and Brescia Spedali Civili Hospital, Brescia, Italy

**Nicola Latronico, MD**
Professor of Anesthesia and Critical Care Medicine, University of Brescia; Clinical Director, Department of Anesthesia, Critical Care and Emergency, Spedali Civili University Hospital, Brescia, Italy

**Marco Rizzi, MD**
Department of Infectious Diseases, Azienda Ospedaliera Papa Giovanni XXIII Hospital, Bergamo, Italy

- The role of the BCRSS/algorithm in guiding management is important, but the numerical score is also used by treating clinicians to easily compare and summarize patients.
- Noninvasive ventilation is concerning for aerosolization, but is included in the BCRSS/algorithm due to ventilator scarcity in Italy.

## Evidence Appraisal

This scale has not been externally validated and has been published by MDCalc as a possible method to easily assess and compare patients in a time of crisis.

## Use the Calculator Now

Click here to access the BCRSS/Algorithm on MDCalc.

## References
### Original/Primary Reference

- Italian Society of Infectious and Tropical Diseases (SIMIT). [Guidelines on therapeutic and supportive management for patients with COVID-19 coronavirus infection.] 2020. Available at: **https://www.eahp.eu/sites/default/files/ linee_guida_sulla_gestione_terapeutica_e_di_supporto_ per_pazienti_con_infezione_da_coronavirus_covid-19.pdf**. Accessed April 1, 2020.

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### Why to Use
The BCRSS/algorithm uses patient examination features along with the need for escalating levels of respiratory support (noninvasive ventilation, intubation, proning) to suggest treatment recommendations. The scale drastically simplifies the clinical summary of a patient's status, and allows clinicians to compare patients to one another and to track the trend of a patient's level of respiratory severity over time. It also allows clinicians to more closely monitor patients nearing a critical action point (eg, Level 3–possibly nearing the need for intubation).

### When to Use
- The BCRSS/algorithm is being used in Italy for patients who have COVID-19 pneumonia, **or** patients who have had COVID-19 symptoms for ≥ 7 days **and** either have a positive PCR test result for COVID-19 **or** have high clinical suspicion for COVID-19.
- The scale is designed for use in **every patient** who meets the diagnostic criteria. It has been a critical tool for the hospital in Brescia, Italy, where it was developed during the current pandemic in order to compare and quickly summarize a patient's clinical severity.

### Next Steps
- Information about COVID-19 is rapidly changing; MDCalc will attempt to update this scale as frequently as possible to keep up with the evolving nature of the COVID-19 pandemic.
- While the BCRSS/algorithm indicates increasing levels of respiratory severity, local hospital guidelines and/or drug availability may indicate different treatment recommendations.
- The scale is meant to be dynamic, reassessed frequently, and rescored after interventions. The frequency of reassessment is guided by clinical judgment; for example, a new patient in the ED may need to be reassessed every 15 minutes, while a stable patient on the medical floor may need reassessment every 6 to 12 hours. If a patient is assigned a new level, the medical and respiratory management should change accordingly.

Abbreviations: BCRSS, Brescia-COVID repiratory severity scale; ED, emergency department; PCR, polymerase chain reaction.