

Emergency Department COVID-19 Severity Classification

This tool was developed to assist in determining the appropriate evaluation and disposition for adult patients with suspected or confirmed COVID-19.



ANY CRITICAL INTERVENTION

- HFNC or NIPPV
- Mechanical Ventilation
- Vasopressors

- Other clinical presentations or pre-existing conditions other than the items listed may additionally increase a patient's risk profile.
- Do not use if the patient is having an acute MI, stroke, or other life-threatening condition.
- Further consideration should be given to patients on immunosuppression and/or have recent steroid usage as this may alter their clinical presentation and severity risk.

	MILD-LOW RISK	MILD-AT RISK	MODERATE	SEVERE	CRITICAL																								
	Requires ALL in column		Fulfilled with ANY ONE in column																										
1 Assess Vital Signs																													
Heart Rate (BPM)	<input type="checkbox"/> < 100	<input type="checkbox"/> 101 - 120	<input type="checkbox"/> ≥ 121																										
Blood Pressure (mmHg)					<input type="checkbox"/> SBP < 90																								
SpO2 (lowest documented)	<input type="checkbox"/> ≥ 93%	+0	<input type="checkbox"/> 89 - 92%	+2	<input type="checkbox"/> < 88%																								
Respiratory Rate	<input type="checkbox"/> < 22	+0	<input type="checkbox"/> ≥ 29	+2																									
O2 Flow Rate (L/min)	<input type="checkbox"/> None	+0	<input type="checkbox"/> NC O2 (3-4)	+4	<input type="checkbox"/> NC O2 (≥5)																								
2 Calculate qCSI^A	_____ + _____ + _____ + _____																												
=	<input type="checkbox"/> 0	<input type="checkbox"/> 1-2	<input type="checkbox"/> 3-5	<input type="checkbox"/> 6-8	<input type="checkbox"/> ≥9																								
3 Assess Symptoms^B			<input type="checkbox"/> Persistent dyspnea	<input type="checkbox"/> Hemoptysis	<input type="checkbox"/> Altered LOC																								
Ask About Risk Factors^C	<input type="checkbox"/> 0-1 Risk Factors	<input type="checkbox"/> ≥ 2 Risk Factors	<input type="checkbox"/> LT Care Resident ^D																										
4 Discharge Home Criteria	If all else in green above is true, and...																												
Exertional O2 ^E Saturation	<input type="checkbox"/> Normal	<input type="checkbox"/> < 90% or 3% drop																											
Clinical Gestalt	<input type="checkbox"/> Well/Healthy																												
Work of Breathing	<input type="checkbox"/> Normal/Comfortable																												
Blood Pressure	<input type="checkbox"/> Normal for Patient ^F																												
Any concern for other conditions or reasons to admit	<input type="checkbox"/> None	<input type="checkbox"/> Other condition that warrants further workup	<input type="checkbox"/> Other condition that warrants admission																										
5 Diagnostic Testing	<table border="1"> <tr> <td><input type="checkbox"/> Recommend</td> <td><input type="checkbox"/> Consider</td> <td><input type="checkbox"/> CXR</td> <td><input type="checkbox"/> CXR</td> <td><input type="checkbox"/> CXR</td> <td><input type="checkbox"/> CXR</td> </tr> <tr> <td><input type="checkbox"/> Obtain Labs</td> <td><input type="checkbox"/> Obtain Labs</td> <td><input type="checkbox"/> POCUS Cardiac Exam</td> <td><input type="checkbox"/> POCUS Cardiac Exam</td> <td><input type="checkbox"/> POCUS Cardiac Exam</td> <td><input type="checkbox"/> POCUS Cardiac Exam</td> </tr> </table>					<input type="checkbox"/> Recommend	<input type="checkbox"/> Consider	<input type="checkbox"/> CXR	<input type="checkbox"/> CXR	<input type="checkbox"/> CXR	<input type="checkbox"/> CXR	<input type="checkbox"/> Obtain Labs	<input type="checkbox"/> Obtain Labs	<input type="checkbox"/> POCUS Cardiac Exam	<input type="checkbox"/> POCUS Cardiac Exam	<input type="checkbox"/> POCUS Cardiac Exam	<input type="checkbox"/> POCUS Cardiac Exam												
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RISK FACTORS

Demographics

- Male
- Age >60
- Black

Medical Conditions

- Cardiovascular Disease
- Cerebrovascular Disease
- COPD
- Diabetes Type II
- Hypertension
- Malignancy
- Obesity (BMI > 30)
- Renal Disease

SUGGESTED LABS

- CMP
- CBC w/ diff
- CRP
- D-Dimer
- Ferritin
- Lactate
- LDH
- Troponin

SEVERE LABS

- Troponin (>99%)
- D-dimer (≥1µg/mL)
- Lymphopenia (<0.8 x 10⁹/L)
- LDH (<250 U/L)
- CRP (≥10 mg/L)
- Creatinine (>133 µmol/L)
- ALT (>40 U/L)
- AST (>40 U/L)
- Neutrophils (8,000/mm³)
- Thrombocytopenia (<150,000/mm³)
- WBC (<4,000/mm³ or >10,000/mm³)

- A. qCSI** - The qCSI is a predictive model of early hospital respiratory decompensation among patients with COVID-19. Eight hospitals were used for development and internal validation (n = 932) and 1 hospital for model external validation (n = 240). Prediction of critical respiratory disease within 24-hours was defined by high oxygen requirements, non-invasive ventilation, invasive ventilation, or death.
- Components of qCSI include- nasal cannula flow rate, respiratory rate, and minimum documented pulse oximetry
 - qCSI scoring
 - I. qCSI score of ≤ 2 : Low-risk (4%)
 - II. qCSI score 3-5: Low-intermediate risk (19%)
 - III. qCSI score 6-8: High-intermediate risk (40%)
 - IV. qCSI score > 9 : High risk (73%)
 - Results- During the study period, 1172 patients qualified for the final cohort. Of these patients, 144 (12.3%) met the composite endpoint within the first 24 hours. The qCSI had a high AUC (0.90) that exceeded the qSOFA (0.76).
- B. Symptoms**
- Persistent Dyspnea - 3 mortality², 1.9 higher level of care⁴, 8.3 disease severity²
 - Hemoptysis - 4.5 higher level of care⁴, 7 disease severity²
 - Altered LOC - 4.7 higher level of care⁴, 6.3 disease severity²
- C. Risk Factors**
- Male - 1.8 mortality², 1.9-2 higher level of care²⁻³, 1.5 disease severity²
 - Age ≥ 60 - 3.8 mortality², 4.1 disease severity²
 - African-American - 2.1 higher level of care³, 2.1 severity³
 - Cardiovascular Disease (including CHF) - 3.4 mortality², 3.4 higher level of care², 3.5 disease severity²
 - Cerebrovascular Disease - 3 mortality², 2.8 disease severity²
 - COPD - 3.7 mortality², 4.4 disease severity²
 - Diabetes - 1.9 mortality², 1.8-2.1 higher level of care³⁻², 2 disease severity²
 - Hypertension - 2.5 mortality², 3 higher level of care², 2.8 disease severity²
 - Malignancy - 1.9 mortality², 3-4.1 higher level of care^{2,4}, 2.2 disease severity²
 - Obesity (BMI > 30) - 3 mortality¹⁻², 2 higher level of care³
 - Renal Disease - 4.3 mortality², 1.2 higher level of care², 2.2 disease severity²
- D. Long Term Care Resident** - these patients will often need admission due to the risk of them transmitting COVID to other nursing home residents.

- E. Exertional O2 Saturation** - a 1-minute sit-to-stand test can be performed within the patient's room. With this, they sit and stand as many as they can over the course of 1 minute.
- A 3% drop in pulse oximeter reading is considered a positive test
- F. Blood Pressure** - "normal for patient" means that the patient's BP is normal for them in consideration of past medical history of HTN and whether they are on antihypertensive medications.
- G. Imaging Results**
- CXR Score - A scoring system devised to calculate a severity score based on the presence or absence of opacities on chest x-ray. The score is computed by dividing each lung into 3 zones. A severity score is assigned based on the presence or absence of opacity in each zone.
 - ≥ 2 - A score of ≥ 2 indicates a higher likelihood of hospital admission (OR 6.2)¹⁷.
 - ≥ 3 - A score of ≥ 3 is a predictor of need for intubation (OR 4.7)¹⁷.
 - Bilateral Pneumonia - 1.6 mortality², 2.4 disease severity²
 - RV Enlargement - 4.5 mortality⁵
- H. Lab Results**
- Troponin (> 99 th % per test) - 13.7 mortality²
 - D-dimer ($> 1\mu\text{g/mL}$) - 6 mortality², 3.4 disease severity²
 - Lymphopenia ($< 0.8 \times 10^9/\text{L}$) - 2.2 mortality², 1.1-3 higher level of care^{2,4}, 4.2 disease severity²
 - LDH ($> 250 \text{ U/L}$) - 3.2 mortality², 1 higher level of care⁴, 5.5 disease severity²
 - CRP ($\geq 10 \text{ mg/L}$) - 4.5 mortality², 6.5 disease severity²
 - Creatinine ($> 133\mu\text{mol/L}$) - 2.8 mortality²
 - AST ($> 40 \text{ U/L}$) - 3.3 mortality², 3.6 disease severity²
 - ALT ($> 40 \text{ U/L}$) - 2.1 mortality², 2.1 disease severity²
 - Neutrophils ($> 8,000/\text{mm}^3$) - 5.6 mortality²
 - Thrombocytopenia ($< 150,000/\text{mm}^3$) - 7.3 mortality², 1.1 higher level of care², 1.8 disease severity²
 - WBC ($< 4,000/\text{mm}^3$) - 0.3 mortality², 0.9 higher level of care². ($> 10,000/\text{mm}^3$) - 4.3 mortality², 3.4 disease severity²
 - Lactate (≥ 2) - a lactate ≥ 2 has been demonstrated in other disease processes to be associated with poor outcomes and mortality. If the lactate is ≥ 4 , an assessment should be performed for severe sepsis.
 - Ferritin ($> 300 \text{ ng/ml}$) - 9.1 mortality⁷

Citations

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