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.

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- 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.

ANY CRITICAL INTERVENTION

- ☐ HFNC or NIPPV
- ☐ Mechanical Ventilation
- ☐ Vasopressors

	MILD-LOW RISK		MILD-AT RISK		MODERATE		SEVERE		CRITICAL
	Requires ALL in column		Fullfilled with ANY ONE in column						
1 Assess Vital Signs									
Heart Rate (BPM)	☐ < 100		☐ 101 - 120		☐ ≥ 121				
Blood Pressure (mmHg)									☐ SBP < 90
SpO2 (lowest documented)	☐ ≥ 93%	+0			☐ 89 - 92%	+2	☐ < 88%	+5	
Respiratory Rate	☐ < 22	+0	☐ 23 - 28	+1	☐ ≥ 29	+2			
O2 Flow Rate (L/min)	☐ None	+0	☐ NC O2 (1-2)	+0	☐ NC O2 (3-4)	+4	☐ NC O2 (≥5)	+5	
2 Calculate qCSI[A]	_____ +		_____ +		_____ +		_____ +		_____
=	☐ 0		☐ 1-2		☐ 3-5		☐ 6-8		☐ ≥9
3 Assess Symptoms[B]					☐ Persistent dyspnea		☐ Hemoptysis		☐ Altered LOC
Ask About Risk Factors[C]	☐ 0-1 Risk Factors		☐ ≥ 2 Risk Factors		☐ LT Care Resident[D]				
4 Discharge Home Criteria	**If all else in green above is true, and...**								
Exertional O2[E] Saturation	☐ Normal		☐ < 90% or 3% drop						
Clinical Gestalt	☐ Well/Healthy								
Work of Breathing	☐ Normal/Comfortable								
Blood Pressure	☐ Normal for Patient[F]								
Any concern for other conditions or reasons to admit	☐ None		☐ Other condition that warrants further workup		☐ Other condition that warrants admission				
5 Diagnostic Testing			CXR Obtain Labs		CXR POCUS Cardiac Exam Obtain Labs		CXR POCUS Cardiac Exam Obtain Labs		CXR POCUS Cardiac Exam Obtain Labs
6 Imaging Results[G]									
CXR					☐ CXR Score 2		☐ CXR Score ≥3		
POCUS Cardiac Exam							☐ Bilateral Pneumonia ☐ RV Enlargement		
Lab Results[H]							☐ ≥ 1 Severe Lab (see chart) ☐ Lactate 2-4		☐ Lactate ≥4
7 Disposition	Discharge Home		Observation Discharge Home ☐ If pulse oximetry and/or follow-up can be arranged ☐ If reduced bed capacity		Inpatient		Intermediate Inpatient ☐ With additional rounding Transfer ☐ If your hospital doesn't have the resources to care for patient		ICU Transfer ☐ If your hospital doesn't have the resources to care for patient

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 10^9/L)
- ☐ LDH (<250 U/L)
- ☐ CRP (≥10 mg/L)
- ☐ Creatinine (>133 µmol/L)
- ☐ ALT (>40 U/L)
- ☐ AST (>40 U/L)
- ☐ Neutrophils (8,000/mm^3)
- ☐ Thrombocytopenia (<150,000/mm^3)
- ☐ WBC (<4,000/mm^3 or >10,000/mm^3)

Recommend / Consider

Last Updated- July 2020

Footnotes

All numbers shown with risk factors are for Odds Ratios that are statistically significant

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 mortality[2], 1.9 higher level of care[4], 8.3 disease severity[2]
- Hemoptysis - 4.5 higher level of care[4], 7 disease severity[2]
- Altered LOC - 4.7 higher level of care[4], 6.3 disease severity[2]

C. Risk Factors

- Male - 1.8 mortality[2], 1.9-2 higher level of care[2-3], 1.5 disease severity[2]
- Age ≥60 - 3.8 mortality[2], 4.1 disease everity[2]
- African-American - 2.1 higher level of care[3], 2.1 severity[3]
- Cardiovascular Disease (including CHF) - 3.4 mortality[2], 3.4 higher level of care[2], 3.5 disease severity[2]
- Cerebrovascular Disease - 3 mortality[2], 2.8 disease severity[2]
- COPD - 3.7 mortality[2], 4.4 disease severity[2]
- Diabetes - 1.9 mortality[2], 1.8-2.1 higher level of care[3-2], 2 disease severity[2]
- Hypertension - 2.5 mortality[2], 3 higher level of care[2], 2.8 disease severity[2]
- Malignancy - 1.9 mortality[2], 3-4.1 higher level of care[2,4], 2.2 disease severity[2]
- Obesity (BMI >30) - 3 mortality[1-2], 2 higher level of care[3]
- Renal Disease - 4.3 mortality[2], 1.2 higher level of care[2], 2.2 disease severity[2]

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 mortality[2], 2.4 disease severity2
- RV Enlargement - 4.5 mortality[5]

H. Lab Results

- Troponin (>99th % per test) - 13.7 mortality[2]
- D-dimer (>1µg/mL) - 6 mortality[2], 3.4 disease severity[2]
- Lymphopenia (< 0.8 × 10^9/L) - 2.2 mortality[2], 1.1-3 higher level of care[2,4], 4.2 disease severity[2]
- LDH (>250 U/L) - 3.2 mortality[2], 1 higher level of care[4], 5.5 disease severity[2]
- CRP (≥10 mg/L) - 4.5 mortality[2], 6.5 disease severity[2]
- Creatinine (>133µmol/L) - 2.8 mortality[2]
- AST (>40 U/L) - 3.3 mortality[2], 3.6 disease severity[2]
- ALT (>40 U/L) - 2.1 mortality[2], 2.1 disease severity[2]
- Neutrophils (>8,000/mm^3) - 5.6 mortality[2]
- Thrombocytopenia (< 150,000/mm^3) - 7.3 mortality[2], 1.1 higher level of care[2], 1.8 disease severity[2]
- WBC (<4,000/mm^3) - 0.3 mortality[2], 0.9 higher level of care[2]. (>10,000/mm^3) - 4.3 mortality[2], 3.4 disease severity[2]
- 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 ng/ml) - 9.1 mortality[7]

Citations

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