

# LITERATURE REVIEW SARS-CoV 2 Clinical Presentation

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## TYPICAL PRESENTATION

### COMMON SYMPTOMS

**Fever (70%)**
**Cough (70%)**
**Dyspnea (70%)**
**Muscle Aches (36%)**
**Headaches (34%)**

**Others:** fatigue, anorexia, anosmia, dysgeusia, diarrhea, nausea / vomiting, abdominal pain, sputum production, hemoptysis, cutaneous manifestations

### LABS

lymphopenia, hypoalbuminemia, elevated CRP, elevated LDH, elevated ESR, normal procalcitonin

### IMAGING

Bilateral multi-focal opacities on CXR, bilateral ground glass opacities on CT  
Chest ultrasound useful in detecting peripheral pulmonary pathologies and interstitial syndromes

### INCUBATION PERIOD

14 days from time of exposure  
4 to 5 days median incubation period

### DURATION OF ILLNESS

**Mild to moderate disease:** 2 weeks  
**Severe disease:** 3-6 weeks

### ASYMPTOMATIC PRESENTATION

**40-45%** of those infected with SARS-CoV-2 will remain asymptomatic for duration of illness  
May be associated with CT abnormalities

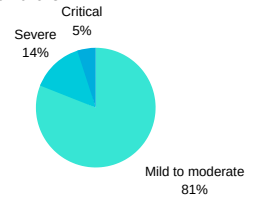
### DISEASE SEVERITY

Among 72,314 persons with COVID-19 in China.

**Mild:** no or mild pneumonia

**Severe:** dyspnea, respiratory distress

**Critical:** respiratory failure, septic shock, and/or multi-organ dysfunction or failure



## \*\*\*SEVERE DISEASE AND MORTALITY

### IMMUNOCOMPROMISED

- CANCER PATIENTS:** healthcare exposure is significant risk factor; breast & prostate cancer are more prevalent among US & UK patients, with increased risk of severe outcomes, including intubation & death. Highest fatality rates seen with hematologic and lung malignancies, and in age groups 45-60 years and >75 years.
- HEMATOLOGIC MALIGNANCY:** higher levels of immunosuppression lead to more severe respiratory viral infections than solid tumors. There is an increased risk of COVID-19-related serious events (ICU admission, MV support, or death).
- BONE MARROW TRANSPLANT RECIPIENTS:** increased risk of poor outcomes with COVID-19 infection due to immunosuppressive agents
- ON LONG TERM GLUCOCORTICOIDS:** longer incubation and viral shedding periods shown in single familial cluster report
- HIV+ PATIENTS:** inconclusive data if higher risk of severe disease
- ORGAN TRANSPLANTS:** inconclusive data if higher risk of severe disease. It may be that underlying chronic illnesses which lead to transplant may dictate risk, more so than transplant status.

### CHILDREN

Visit [pediatric infographic](#)

### PREGNANT WOMEN

- Most are mild and often asymptomatic.
- Most common symptoms are fever (62.9%) and cough (36.8%)
- Pregnant women with COVID-19 are more likely to be hospitalized and are at increased risk for ICU admission and receipt of mechanical ventilation than nonpregnant women.
- Incidence of preterm birth, low birth weight, C-section, NICU admission are higher than the general population
- Maternal death, pregnancy loss, and laboratory evidence of vertical transmission are infrequently reported

### ELDERLY

- Significantly higher rate of severe disease, ICU admission, and mortality than younger patients
- Nonspecific signs & symptoms are falls, general health decline, delirium, and GI symptoms
- Can be asymptomatic

### RISK FACTORS FOR SEVERE DISEASE AND MORTALITY

#### Non-Modifiable

- Older age (>65 years)
- Black, Hispanic, or South Asian ethnicity
- Male sex
- In patients age >60 years: muscle aches, absence of fever
- Cancer
- High SOFA score
- Down Syndrome

#### Modifiable

- Hypertension, cardiovascular disease, cerebrovascular disease
- Overweight (BMI 25 - <30), obesity (BMI ≥ 30 kg/m<sup>2</sup>), diabetes mellitus
- Smoking history (current/former), COPD
- High-dose corticosteroid use
- Acute kidney injury (AKI) during hospitalization

### PROGNOSTIC MARKERS OF SEVERE DISEASE

#### Hematologic

- Thrombocytopenia, lymphopenia
- Elevated RDW (>14.5%) at admission and increasing RDW during hospitalization
- High neutrophil:lymphocyte ratio (especially in males)
- Significantly elevated WBC count (WMD: 4.15×10<sup>9</sup>/L), CD8+ T cells ≤ 75 cell/microliter, decreased CD4+ count

#### Coagulation Parameters

- Prolonged PT
- Increased fibrin degradation products; D-dimer > 1 microgram/mL
- Fibrinolysis shutdown (elevated D-Dimer and complete failure of clot lysis at 30 minutes on TEG) predicts thromboembolic events and need for hemodialysis

#### Liver/Kidney Biomarkers and Enzymes

- High LDH levels
- Significant elevations in ALT, AST, total bilirubin
- Significant elevations in BUN and creatinine
- Elevated C-reactive protein (CRP)
- Elevated procalcitonin associated with a nearly 5-fold higher risk of severe disease

#### Others

- Cardiac troponin significantly elevated (WMD: 32.7 ng/L)
- Acute cardiac injury 13 times more common in ICU-COVID patients than in non-ICU COVID patients
- Cancer patients - advanced tumor stage, elevated TNF-α and NT-proBNP, and decreased CD4+ T cells and albumin-globulin ratio
- Chills, body temperature > 37.5 °C, findings of pneumonia on chest X-ray

## POTENTIAL COMPLICATIONS

<p><b>LUNGS</b></p> <ul style="list-style-type: none"> <li>ARDS: 15-33% of cases (8 days after sx onset); increased risk in older age, neutrophilia, increased LDH, increased D-Dimer, age &gt;65yrs, DM, HTN</li> <li>Acute respiratory failure: 8% of cases; leading cause of mortality</li> <li>Pneumonia</li> </ul>	<p><b>THROMBOTIC</b></p> <ul style="list-style-type: none"> <li>31% incidence of thrombotic complications in one study of 184 pts</li> <li>Predisposes to venous and arterial thromboembolic events due to excessive inflammation, hypoxia, immobilization and DIC</li> <li>PE is most frequent thrombotic complication</li> <li>Age and coagulopathy (PT&gt;3s, APTT&gt;5s) are independent predictors</li> </ul>
<p><b>CARDIO-VASCULAR</b></p> <ul style="list-style-type: none"> <li>Reported in 7-20% of cases. Prevalence high among patients who are severely ill</li> <li>Vascular inflammation cardiac arrhythmias, myocarditis, cardiomyopathy, acute onset heart failure, MI, cardiac arrest</li> <li>Less common: myocarditis, cardiac tamponade, fulminant myocarditis</li> <li>1 case of ITP</li> </ul>	<p><b>KIDNEY</b></p> <ul style="list-style-type: none"> <li>Low prevalence, but is a marker of multi organ failure and severe disease</li> <li>40% pts with proteinuria and 26% with hematuria on admission</li> <li>5% pts developed AKI and increased hospital mortality</li> <li>Stage 3 AKI in 50% of pts; rhabdomyolysis, metabolic acidosis, and hyperkalemia</li> <li>Old age, DM, severe illness, and positive fluid balance are associated factors</li> </ul>
<p><b>LIVER</b></p> <ul style="list-style-type: none"> <li>Reported in 14-53% of cases</li> <li>Abnormal aminotransferase levels in patients with severe illness (AST and ALT &gt;40)</li> <li>Clinically significant liver injury is uncommon</li> </ul>	<p><b>NEUROLOGIC</b></p> <ul style="list-style-type: none"> <li>Viral invasion of CNS in patients with severe illness</li> <li>Observed in 36% of 214 patients in one study</li> <li>Acute CVA disease, impairment of consciousness, ataxia, seizures, and encephalopathy; prognosis is poor for these patients</li> <li>Guillain-Barre syndrome seen in 4 cases</li> </ul>
<p><b>INFECTION</b></p> <ul style="list-style-type: none"> <li>Sepsis and septic shock reported in 4-8% of cases</li> <li>Secondary infection reported in 6-10% of cases; staph and strep are common</li> <li>DIC: cytokine release syndrome with persistent fevers, increased ferritin, D-dimer, and proinflammatory cytokines</li> <li>Conjunctivitis seen in several cases</li> </ul>	<p><b>CUTANEOUS</b></p> <ul style="list-style-type: none"> <li>Exanthematous rash in several cases at disease onset or after recovery</li> <li>"COVID toes" - pernio acral lesions reported across age spectrum</li> <li>Retiform purpura and necrotic vascular lesions with severe cases</li> <li>Vesicular varicella-like eruptions in several reports</li> <li>Multisystem inflammatory syndrome in children (Kawasaki-like)</li> </ul>
<p><b>MIS-A</b></p> <ul style="list-style-type: none"> <li>Adult multisystem inflammatory syndrome (MIS-A)</li> <li>Often has features of Kawasaki Disease: conjunctivitis, cracked lips, edema of hands and feet, palmar erythema, diffuse maculopapular rash, cervical lymphadenopathy.</li> <li>Lab features: elevated inflammatory markers, abnormal coagulation profiles, markers of organ dysfunction.</li> <li>Diagnosis of exclusion (sepsis, toxic shock, and autoimmune diseases).</li> </ul>	

For details and references please visit <https://oume.uthscsa.edu/longco/>