PRESENTATION

INCUBATION PERIOD
- Most cases occur about 4-5 days after exposure\(^1\,^9\)
- 97.5% of patients will develop symptoms by day 12\(^9\)

SYMPTOMS, IN ORDER OF DECREASING FREQUENCY

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>FREQUENCY</th>
</tr>
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<tbody>
<tr>
<td>Fever</td>
<td>83-99% during disease course(^1,^7)</td>
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<tr>
<td></td>
<td>44-52% at presentation(^5,^8)</td>
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<tr>
<td>Cough</td>
<td>59-83%(^1,^9)</td>
</tr>
<tr>
<td></td>
<td>Productive in 23-41%(^1,^3,^5,^7)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>23-70%(^1,^4,^7)</td>
</tr>
<tr>
<td>Myalgia</td>
<td>10-35%(^1,^6)</td>
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<tr>
<td>Dyspnea</td>
<td>May be as low as 19% in a mix of inpatients/outpatients(^5)</td>
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<tr>
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<td>On presentation to the hospital ranges 31-76%(^1,^3,^4,^7,^8)</td>
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<tr>
<td>Sore throat</td>
<td>5-17%(^1,^2,^2), although one case series reported rates up to 61%(^9)</td>
</tr>
<tr>
<td>Headache</td>
<td>6-14%(^1,^5)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>2-15%(^1,^3,^5,^8)</td>
</tr>
<tr>
<td>Nausea</td>
<td>1-10%(^1,^2,^5,^6)</td>
</tr>
<tr>
<td>Rhinorrhea</td>
<td>4-6%(^2,^4,^5,^9)</td>
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<tr>
<td>Chest pain</td>
<td>2%(^2,^4)</td>
</tr>
</tbody>
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SEVERITY

<table>
<thead>
<tr>
<th>REQUIRING ICU</th>
<th>PERCENTAGE</th>
</tr>
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<tbody>
<tr>
<td>Inpatients/outpatients</td>
<td>5%(^5,,10)</td>
</tr>
<tr>
<td>Hospitalized patients</td>
<td>23-32%(^1,^3,^6)</td>
</tr>
</tbody>
</table>

TIME TO PRESENTATION

<table>
<thead>
<tr>
<th>NUMBER OF DAYS</th>
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<tbody>
<tr>
<td>Days to hospital admission</td>
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<tr>
<td>Days from illness onset to ICU admission</td>
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</tbody>
</table>
## Laboratory Data

### Labs

<table>
<thead>
<tr>
<th>Labs</th>
<th>Abnormal Laboratory Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Blood Cell Count</td>
<td>Lymphocytopenia (~70%)&lt;sup&gt;3,6,11&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Normal WBC count or leukopenia&lt;sup&gt;1-5&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><strong>Elevated WBC can be seen in severe disease and is associated with nonsurvivors</strong>&lt;sup&gt;11&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Elevated neutrophils&lt;sup&gt;1,5&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Mild Thrombocytopenia&lt;sup&gt;11&lt;/sup&gt;</td>
</tr>
<tr>
<td>Biochemistry&lt;sup&gt;1,5,11&lt;/sup&gt;</td>
<td><strong>↑</strong> BUN and creatinine</td>
</tr>
<tr>
<td></td>
<td><strong>↑</strong> AST, ALT, total bilirubin</td>
</tr>
<tr>
<td></td>
<td><strong>↓</strong> albumin</td>
</tr>
<tr>
<td></td>
<td><strong>↑</strong> LDH (~40%), D-dimer, CRP, ESR, troponin</td>
</tr>
<tr>
<td>Coagulation Function</td>
<td>Prolonged prothrombin time&lt;sup&gt;3,11,12&lt;/sup&gt;</td>
</tr>
<tr>
<td>Biomarkers</td>
<td>Procalcitonin not elevated in the majority of cases and if elevated may be associated with secondary infection&lt;sup&gt;1-5,12&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><strong>↑</strong> IL-6 and IL-10&lt;sup&gt;6,12&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><strong>↑</strong> ferritin&lt;sup&gt;6,12&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

### Laboratory abnormalities associated with increased severity<sup>3,6,11,12</sup>

- Higher white blood cell and neutrophil counts
- Higher ESR, D-dimer, lactate dehydrogenase, creatinine kinase, troponin, and creatinine levels

### Imaging

#### Chest CT

- Up to 50% of COVID-19 positive patients may have a normal CT scan 0-2 days after onset of symptoms<sup>13</sup>
- Early Lung Abnormalities<sup>1-5,12-15</sup>
  - Multifocal or peripheral focal ground-opacities bilaterally in ~ 50-75% of patients
- Progressive/Severe Disease Abnormalities<sup>6,7</sup>
  - Consolidation with air bronchograms, crazy paving, bronchial wall thickening
- Atypical Findings<sup>14,15</sup>
  - Reverse Halo sign
  - Discrete pulmonary nodules with halo sign
  - Pleural Effusion
  - Mediastinal Lymphadenopathy

#### Point of Care Lung Ultrasound<sup>16,17,18</sup>

- Presence of B-lines
- Irregular, thickened pleural line with scattered discontinuities
- Subpleural consolidations
- Alveolar consolidation with air bronchograms associated with severe disease
PRESENTATION
(CONTINUED)

CRITERIA FOR TESTING
- COVID should be considered in patients with new onset fever and/or respiratory symptoms (shortness of breath, cough).
- Given the large degree of community transmission, patients with an acute lower respiratory process that is severe with no apparent cause should also be considered for testing.

TREATMENT

Chloroquine/Hydroxychloroquine | Remdesivir | Ritonavir/Lopinavir | Tocilizumab
--- | --- | --- | ---
 Mech: Interferes with virus entry into the cell at ACE-2 receptor | Mech: Nucleotide analogue that inhibits RNA-Dependent RNA Polymerase preventing viral replication | Mech: Reverse transcriptase inhibitor, blocks viral replication by inhibiting proteinases | Mech: Binds to the IL-6 receptor and inhibits its function. Decreases inflammatory response to the virus.

In vitro data shows promise:
- 2020 Wang et al
- 2020 Yao et al

In vivo data encouraging:
- 2020 Gautret et al

Active Trials:
- NCT04303507

Active trials:
- NCT04280705, NCT04292899, NCT04292730

Active Trials:
- NCT04307693, NCT04255017

Active Trials:
- NCT04317092, NCT04320615, NCT04322773

Other Drugs Under Investigation
- RNA polymerase inhibition: Favipiravir - NCT04310228, NCT04303299
- Membrane fusion inhibitor: Umifenovir - NCT04260594
- Interleukin 6 inhibition: Sarilumab - NCT04315298
- Vasoactive intestinal peptide analog: Aviptadil - NCT04311697
76% patients placed on NIV progressed to invasive ventilation.4

Worse outcomes with septic shock, ARDS & AKI 5

Watch for sudden cardiac deterioration after lung recovery

Median hospital LOS in severe patients 13 days (11.5 - 17.0) vs 11 days (10.0 - 13.0) in nonsevere patients5

Respiratory failure, circulatory failure, and combined failure are the commonest causes of death25

The disease presentation and prognosis may vary significantly with 81% of people having mild pneumonias or no respiratory issues, 14% of cases having severe disease requiring supplemental oxygen and 5% being critical cases characterized by respiratory failure, shock or multiorgan disfunction.3

Older age, high Sequential Organ Failure Assessment (SOFA) score, and blood d-dimer levels >1 μg/mL are risk factors for poor prognosis and in-hospital mortality in patients with COVID-19. 6

The MuLBSTA score may be useful in predicting poor prognosis in patients with COVID-19. The factors included in this score are multilobular infiltration, lymphopenia, bacterial co-infection, smoking history, hypertension, and age.2, 26

Of the patients who recover, a significant number of patients will still have radiological abnormalities (ground-glass opacities on CT) at time of discharge.27

Other serious complications other than acute respiratory distress syndrome ARDS (29%) included anemia (15%), acute cardiac injury (12%) and secondary infection (10%).3

The current overall all-cause mortality rate in patients with COVID is 4.2%28 – ranging from 0.5% to 5.9% depending on the country and the percentage of the population being tested in that country.

Mortality also varies significantly depending on the age of the patient. Among people under 49, 0.2% of those who contracted the disease died, compared to 14.8% of those who were 80 and older.29 Young children appear to be mildly affected but may serve as a vector for transmission.

In the US, out of a total of 4,226 COVID-19 cases, there are 44 known deaths. Among these, 15 (34%) deaths were reported among adults aged ≥85 years, 20 (46%) among adults aged 65–84 years, and nine (20%) among adults aged 20–64 years.30


22. Chinese CDC. http://weekly.chinacdc.cn/en/article/id/e53946e2-c6c4-41e9-9a9b-f0b1a8f51


