**COVID-19 ASSESSMENT:**

**SELECTION OF PERSONAL HEALTH METRICS FOR VISUALIZATION USING HGRAPH**

Last updated on: April 2, 2020

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| Selected metrics – Good candidates for visualization using hGraph | | | | |
| Signs and symptoms | | | |  |
| Sign or symptom: | | **Normal values:** | **Suggestive of COVID-19 infection if:** | **Reason for selection:** |
| Fever (elevated temperature) | | 97.7–99.5 °F | Elevated | Elevated in 83-99% of hospitalized cases at some point2,5 (but 56% are afebrile on admission2,5). |
| Labs | | | |  |
| Lab: | | **Normal values:** | **Suggestive of COVID-19 infection if:** | **Reason for selection:** |
| Complete Blood Count (CBC) with differential | **White blood cells (WBC)** | 4,500 to 11,000 cells per microliter (cells/mcL) | Low | Low in 30-45% of patients (but elevated in 5% of patients)2,5. |
| **Platelets** | 150,000 to 450,000 platelets/mcL | Low | Lowin 12-36% of patients3,5. |
| **White blood cell differential:**   * **Lymphocyte percentage** | 20 to 40% | Low | Lowin 83% of patients2,6. Predicts disease severity2,6. Associated with mortality2. |
| **White blood cell differential:**   * **Neutrophil percentage** | 40 to 60% | Elevated | Elevatedin 38% of patients2,3. Predicts disease severity2. |
| Comprehensive Metabolic Panel (CMP) | **Albumin** | 40.0 to 55.0 g/L | Low | Low in 98% of patients3. |
| **Blood Urea Nitrogen (BUN)** | 2.5 to 7.1 mmol/L | Elevated | Elevated in 44% of patients2. |
| **Creatinine** | 0.7 to 1.2 milligrams per deciliter (mg/dL) for males and 0.5 to 1.0 mg/dL for females | Elevated | Elevated in an undetermined percentage of patients11. Predicts disease severity11. |
| **Alanine amino transferase (ALT, SGPT)** | 29 to 33 units per liter (IU/L) for males and 19 to 25 IU/L for females | Elevated | Elevated in 4-53% of patients2. Predicts disease severity2. |
| **Aspartate amino transferase (AST, SGOT)** | 7 to 56 units per liter (IU/L) | Elevated | Elevated in 4-53% of patients2. Predicts disease severity2. |
|  | **Procalcitonin (PCT)** | 0.15 ng/mL or less | Elevated | Elevated in 5.5% of patients overall (14% if severe, 24% in ICU patients)2. |
|  | **Ferritin** | 12 to 300 nanograms per milliliter of blood (ng/mL) for males and 12 to 150 ng/mL for females | Elevated | Elevated in an undetermined percentage of patients2. Predicts disease severity2. |
|  | **D-dimer** | 500 ng/mL or less | Elevated | Elevated in an undetermined percentage of patients4. Associated with mortality2. IL-6 and D-Dimer predict disease severity with 93.3% specificity (tandem testing) and 96.4% sensitivity (parallel testing)4. |
|  | **Interleukin-6 (IL-6)** | 5-15 pg/ml | Elevated | Elevated in an undetermined percentage of patients4. IL-6 and D-Dimer predict disease severity with 93.3% specificity (tandem testing) and 96.4% sensitivity (parallel testing)4. |
|  | **C-reactive protein (CRP)** | Less than 10 milligram per liter (mg/L) | Elevated | Elevated in 61-86% of patients2. Predicts disease severity2. |
|  | **LDH** | 140 units per liter (IU/L) to 280 IU/L | Elevated | Elevated in 27-75% of patients2,11. Predicts disease severity2. |
|  | **International normalized ratio (INR)** | 1.1 or below | Elevated | Elevated in an undetermined percentage of patients2. Predicts disease severity2. |
|  | **Prothrombin time (PT)** | 10.5 to 13.5 seconds | Elevated | Elevated in 58% of patients11 (but low in 30% of patients according to other studies2,3). |
|  | **Thrombin time (TT)** | 15 to 19 seconds | Elevated | Elevated in an undetermined percentage of patients4. Predicts disease severity4. |
|  | **Fibrinogen (FIB)** | 150–400 mg/dl | Elevated | Elevated in an undetermined percentage of patients4. Predicts disease severity4. |
|  | **Glucose (GLU)** | 72-99mg/dL while fasting | Elevated | Elevated in 51% of patients3,4. Predicts disease severity4. |

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| Other non-selected metrics – Not good candidates for visualization using hGraph | | | |
| Signs and symptoms | | | |
| Sign or symptom: | **Normal values:** | **Suggestive of COVID-19 infection if:** | **Reason for non-selection:** |
| Cough | Absent | Present | Present in 46-82% of patients2,5, but information is difficult to capture from free-text clinical narrative. |
| Fatigue | Absent | Present | Present in 35% of patients2, but information is difficult to capture from free-text clinical narrative. |
| Anorexia | Absent | Present | Present in 40-84% of patients2, but information is difficult to capture from free-text clinical narrative. |
| Shortness of breath | Absent | Present | Present in 20-64% of patients2, but information is difficult to capture from free-text clinical narrative. |
| Sputum production | Absent | Present | Present in 28–33% of patients2, but information is difficult to capture from free-text clinical narrative. |
| Myalgias | Absent | Present | Present in 11-35% of patients2, but information is difficult to capture from free-text clinical narrative. |
| Sore throat, rhinorrhea, and other upper respiratory infection symptoms | Absent | Present | Present in <15% of patients2,5, but information is difficult to capture from free-text clinical narrative. |
| Diarrhea and other gastrointestinal symptoms | Absent | Present | Present in <10% of patients2, but information is difficult to capture from free-text clinical narrative. |
| Imaging | | | |
| Test: | **Normal value:** | **Suggestive of COVID-19 infection if:** | **Reason for non-selection:** |
| Portable CXR | Absence of abnormalities | Variable, bilateral patchy opacities most common. | This imaging pattern is non-specific and overlaps with other infections2,15. Information is difficult to capture from free-text clinical narrative. |
| CXR PA/Lateral | Absence of abnormalities | Variable, bilateral patchy opacities most common. | This imaging pattern is non-specific and overlaps with other infections2,15. Information is difficult to capture from free-text clinical narrative. |
| CT Chest | Absence of abnormalities | Ground glass opacification with or without consolidative abnormalities; more likely bilateral with peripheral distribution2. | This imaging pattern is non-specific and overlaps with other infections2,15. Information is difficult to capture from free-text clinical narrative. |

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