به نام خدا

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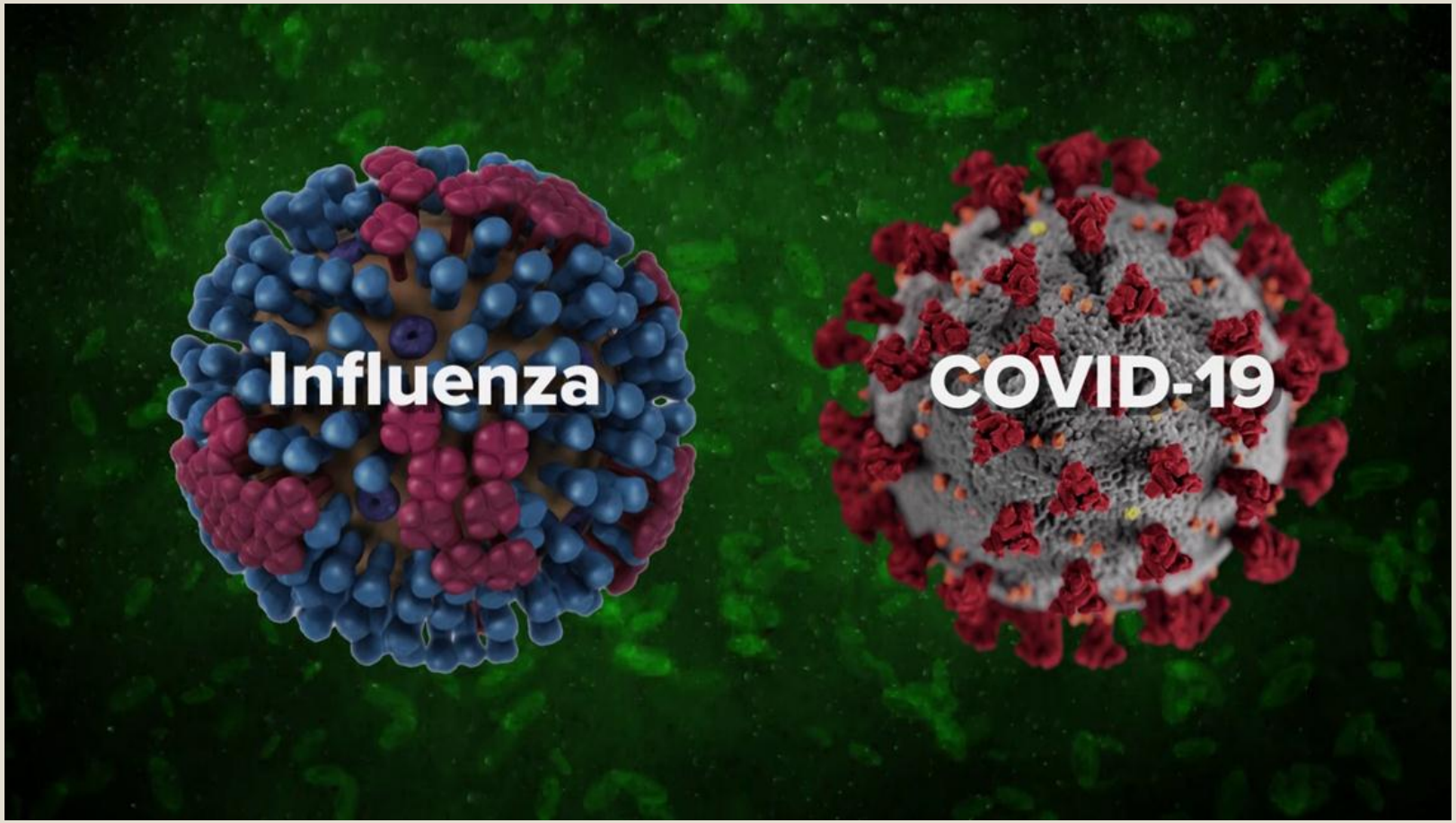

Influenza
COVID-19

- The most common and frequent infections in humans are respiratory virus infections. Influenza viruses and coronaviruses have been the agents responsible for the largest infectious disease pandemics.

- These viruses are easily transmitted by contact, droplets, and fomites. Furthermore, transmission can occur before the appearance of symptoms.

- Although infections with systemic viruses often induce lifelong immunity against disease, respiratory viruses that do not cause high-grade viremia usually can reinfect the same host many times throughout life.

- Reinfection with the same virus is common because of incomplete or waning immunity after natural infection.

CLINICAL MANIFESTATIONS

- Manifest typically within 4–5 days after exposure with fever, respiratory symptoms (cough, dyspnea, sore throat), myalgias, and anosmia/hyposmia, gastrointestinal symptoms of nausea, vomiting, or diarrhea.
- A substantial proportion of patients (possibly a third of those infected) are asymptomatic, but those individuals can transmit the virus to others.
- Most individuals with symptomatic infection have mild disease (no pneumonia).
- Severe disease, typically requiring hospitalization and involving pneumonia and associated manifestations (dyspnea, radiographic involvement of more than half of the lung, and/or hypoxia with oxygen saturation ≤94%), is common.
- Critical disease with manifestations of respiratory failure requiring mechanical ventilation, multiorgan failure, or shock occurs and requires intensive care.

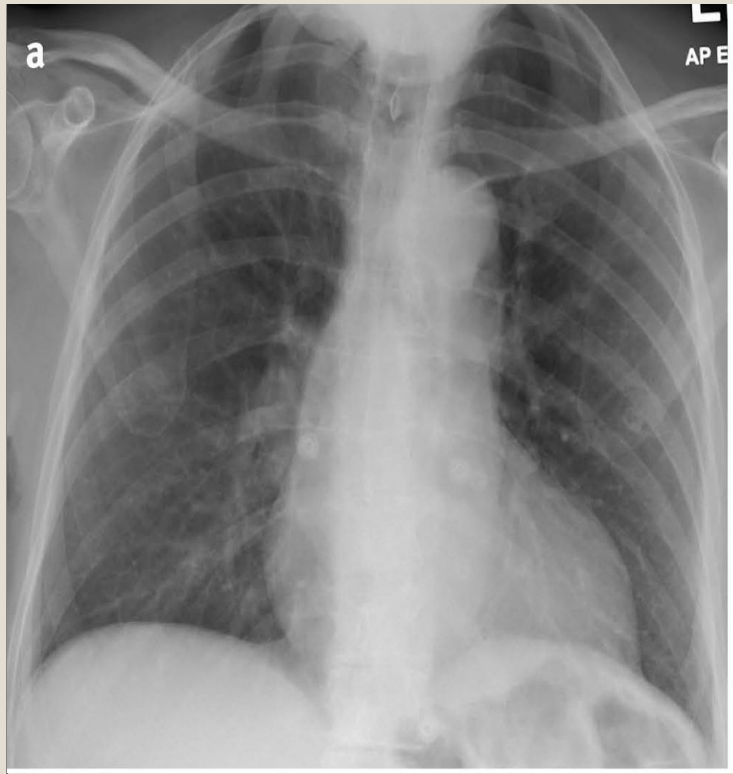
DIAGNOSIS

- The specific diagnosis of infection typically is made using nucleic acid amplification testing (PCR) of respiratory tract secretions. Nasopharyngeal swabs are used mostly commonly, while saliva testing also has been implemented, especially in large-scale population screening efforts.

- Abnormalities consistent with systemic disease including lymphopenia and thrombocytopenia; elevated inflammatory markers, such as interleukin 6 (covid19), tumor necrosis factor α, ferritin, and C-reactive protein; elevated liver enzymes and lactate dehydrogenase; elevated markers of acute kidney injury; elevated D-dimer and prothrombin time; and elevated troponin and creatine phosphokinase.

- Chest radiographs may exhibit abnormal findings such as consolidation and ground-glass opacities that are distributed bilaterally, especially in the lower lung regions, but also may be normal despite respiratory compromise.

- Chest computed tomography (CT) has features (ground-glass opacifications with or without mixed consolidation, pleural thickening, interlobular septal thickening, and air bronchograms) that can be systematically interpreted as typical, indeterminate, or atypical.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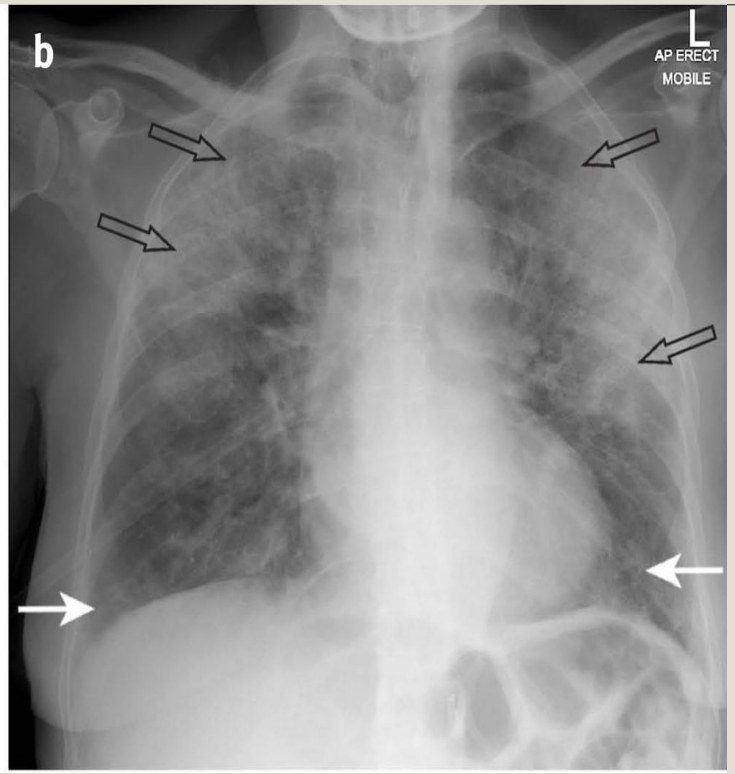
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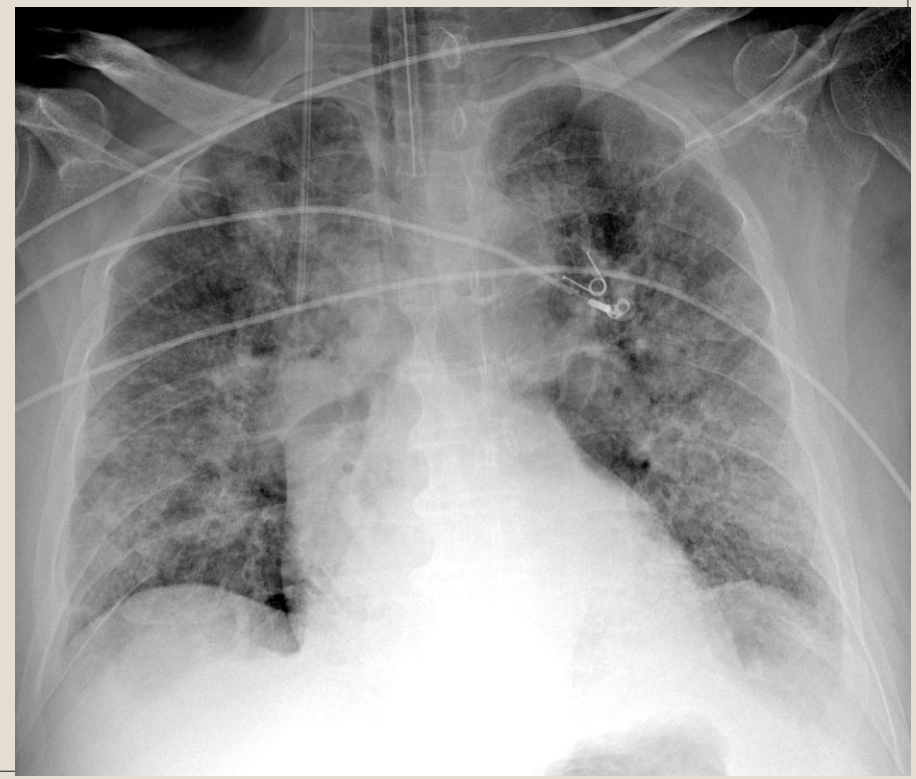

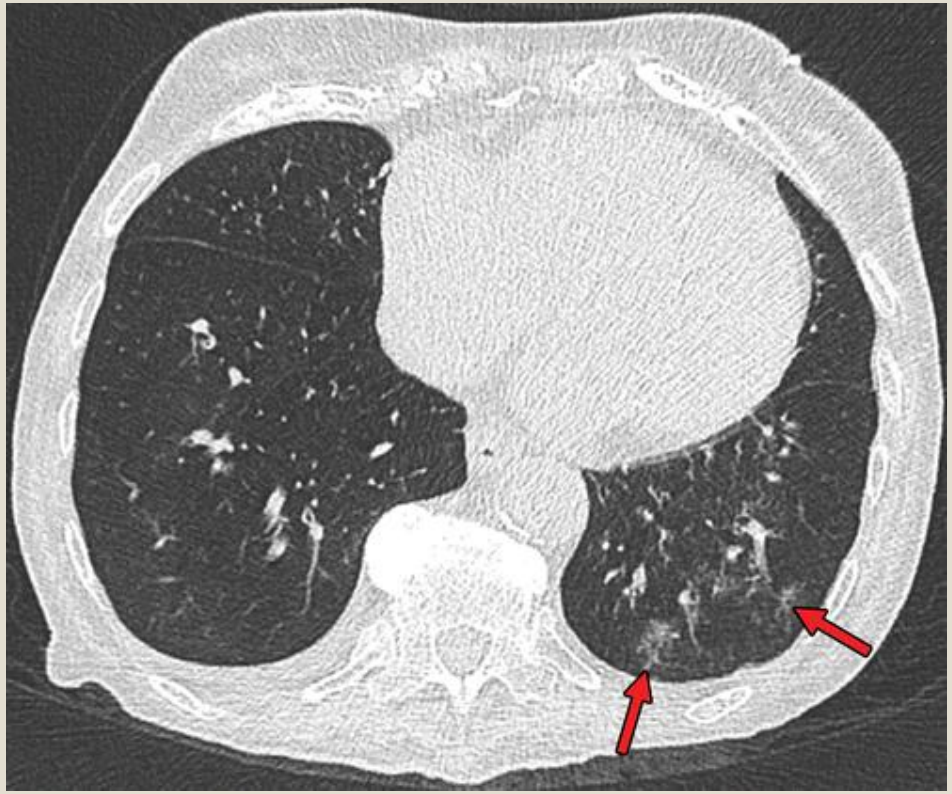

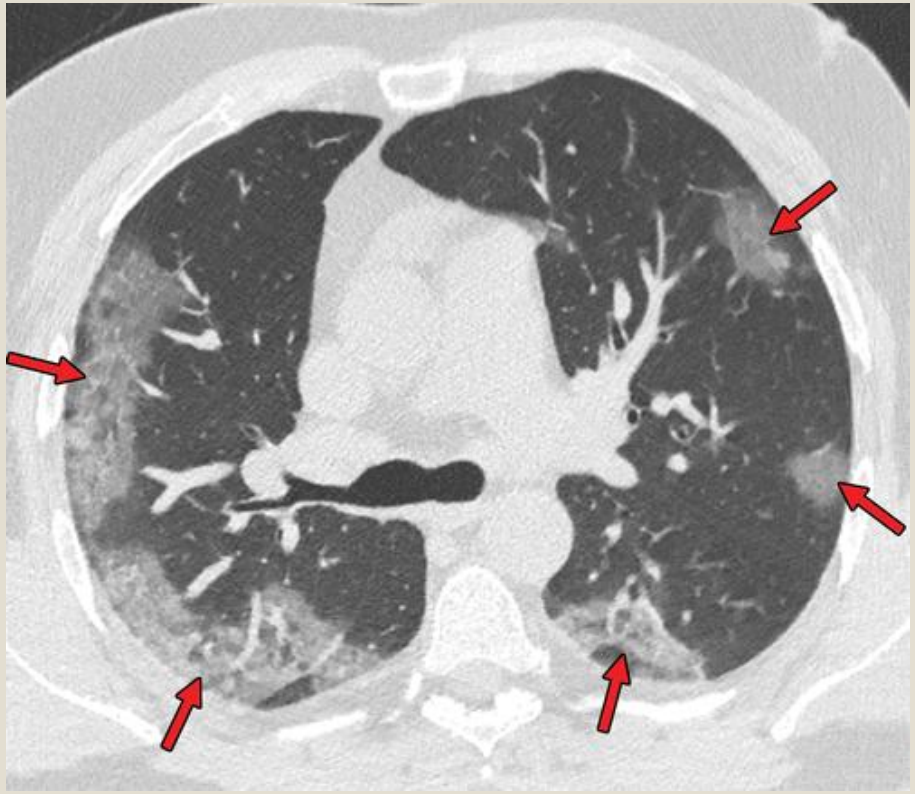

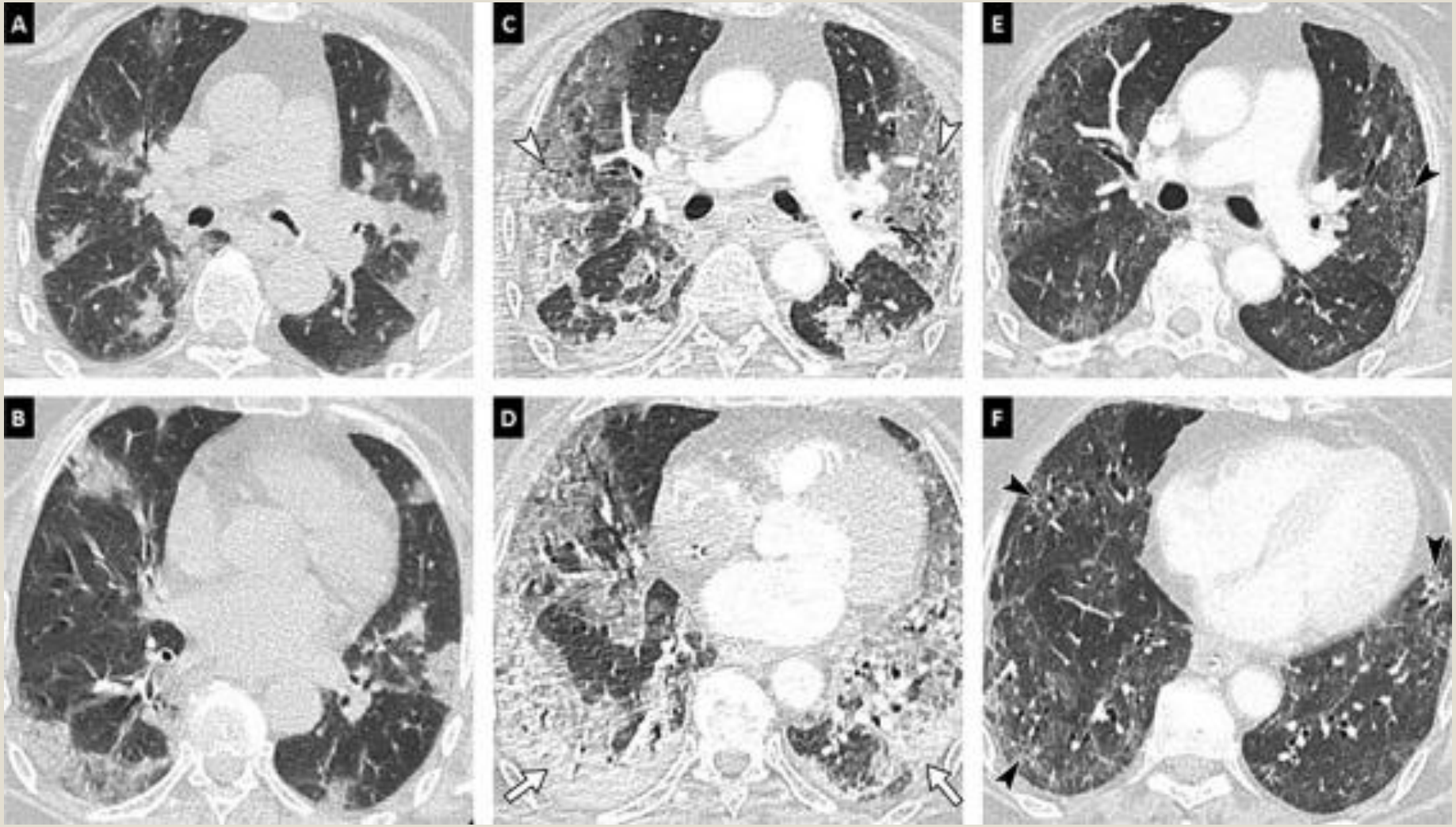
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- **Most medical conditions increase the risk of severe illness, but conditions that especially increase risk are as follows:**
- (1) chronic lung diseases, including COPD, moderate-tosevere asthma, cystic fibrosis, and pulmonary hypertension interstitial lung disease; (2) cancer or cancer treatments, including hematologic malignancies, solid organ transplant, and stem cell transplant; (3) immunodeficiency, including primary immunodeficiency caused by inherited genetic defects or secondary or acquired immunodeficiency caused by prolonged use of corticosteroids, other immunosuppressive drugs, or HIV type 1 (HIV-1) infection; (4) hemoglobin blood disorders, including thalassemia or sickle cell disease; (5) cerebrovascular disease, such as stroke; (6) cognitive impairment or other neurologic conditions; (7) heart conditions, including arterial hypertension, heart failure, coronary artery disease, and cardiomyopathies; (8) obstructive sleep apnea; (9) chronic inflammatory, autoimmune diseases and rheumatic diseases; (10) type 1 or type 2 diabetes mellitus; (11) chronic liver disease, especially cirrhosis; and (12) genetic conditions, especially Down syndrome.

MANAGEMENT OF COVID-19

- The approach to specific treatment of COVID-19 of varying levels of severity.
- Individuals who are infected but have mild disease can be treated with supportive care only.
- Outpatients with certain high-risk factors may be eligible for therapy with monoclonal antibodies (postexposure prophylaxis) or during early mild infection (treatment).
- Individuals with severe respiratory disease (marked by hypoxia [oxygen saturation ≤94% on room air]) are administered oxygen therapy and tracheal intubation and mechanical ventilation if respiratory failure occurs.

- Remdesivir for certain hospitalized COVID-19 patients
- Remdesivir plus baricitinib combination;
- Two different SARS-CoV-2 spike protein–specific monoclonal antibody cocktails
- Systemic treatment with glucocorticoids including dexamethasone, prednisone, methylprednisolone, and hydrocortisone reduces inflammation during severe COVID-19 and may be of clinical benefit, especially in reducing mortality or the need for mechanical ventilation; dexamethasone has the most data supporting benefit in COVID-19.
- The FDA approved IL-6 inhibitors (monoclonal antibodies binding to either the IL-6 cytokine itself [siltuximab] or to the IL-6 receptor [sarilumab or tocilizumab]) reducing the effects of elevated IL-6 could benefit subjects with severe COVID-19.
- The most robust data for efficacy exists for tocilizumab, and many experts suggest adding tocilizumab to dexamethasone therapy in patients with severe or progressive COVID-19.

Influenza

- Three influenza viruses occur in humans: A, B, and C. These viruses are irregularly circular in shape, measure 80–120 nm in diameter, and have a lipid envelope and prominent spikes that are formed by the two surface glycoproteins, hemagglutinin (H) and neuraminidase (N).

- The hemagglutinin functions as the viral attachment protein, binding to sialic acid receptors on the cells that line the superficial epithelium of the respiratory tract.
- The neuraminidase cleaves the virus from the cell membrane to facilitate its release from the cell and prevents self aggregation of viruses.

- When a major shift in the hemagglutinin and/or the neuraminidase occurs, with introduction of a new serotype from an animal or avian reservoir, an influenza A strain has the potential to cause a pandemic. The influenza B and c viruses are more genetically stable than the influenza A viruses and are mainly associated with human infection.

- Vaccination is the best approach to prevent influenza. These vaccines fall into two broad categories: parenterally administered inactivated influenza vaccines and intranasally administered live-attenuated influenza vaccines.

- Current vaccines are further classified based on production substrate (eggs, cell), antigen dose and valence (trivalent or quadrivalent), and the presence or absence of adjuvants. Current inactivated influenza vaccines are designed with the common goal to induce immunity to the hemagglutinin surface glycoprotein of the influenza virus.

- Two doses of vaccine should be given to children <9 years of age who are getting their first or second yearly vaccination. Groups at special risk of experiencing or transmitting influenza and for whom influenza immunization is a particularly high priority.

- In general, influenza vaccine is not recommended for persons with a history of severe allergic reaction to the vaccine or to components other than egg.

TABLE 200-2

High-Risk Groups Who Should Be Assigned a High Priority for Influenza Immunization and Treatment[a]

High-Risk Group
Children 6–59 months of age
Adults ≥50 years of age
Persons with chronic pulmonary (including asthma), cardiovascular (except isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus)
Persons who are immunocompromised (any cause, including medications or HIV infection)
Women who are or plan to be pregnant during the influenza season
Children and adolescents (6 months through 18 years of age) who are receiving aspirin- or salicylate-containing medications and who might be at risk for Reye syndrome
Residents of nursing homes and other long-term-care facilities
American Indians/Alaska Natives
Persons who are extremely obese (BMI ≥40)

- Use of neuraminidase inhibitors should be considered in selected high-risk cases despite a history of vaccination.
- The available neuraminidase inhibitors are oral oseltamivir, nasal-spray zanamivir, and intravenous peramivir.
- Gastrointestinal symptoms, especially nausea, may accompany the administration of oseltamivir.
- The usual duration of therapy with either oral oseltamivir or intranasal zanamivir is 5 days, with twice-a-day dosing.
- Oseltamivir is preferred for treatment of pregnant women and is approved for treatment at any age, beginning at 14 days of life in infants. Asthma and COPD are relative contraindications to the use of intranasal zanamivir; this agent is approved for treatment in persons 7 years and older.
- For hospitalized patients with suspected or confirmed influenza, initiation of oseltamivir is recommended as soon as possible. For patients who cannot tolerate or absorb oral or enterically administered oseltamivir, the use of a single infusion of intravenous peramivir should be considered.

TREATMENT OF COMPLICATIONS

- Bacterial superinfection of COVID-19 and Influenza probably occurs, but the incidence is uncertain.

- Other complications occur, including acute respiratory distress syndrome, acute cardiac injury, arrhythmias, thromboembolic events, acute kidney injury, and shock.

- Anticoagulation in the face of COVID-19–associated thromboembolic events is an especially complex situation and requires expert consultation

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