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2nd Edition

A Clinical Compendium of Medicine 2026

Editors-in-Chief
Jyotirmoy Pal
Nandini Chatterjee

JAYPEE

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SECTION 7

INFECTIOUS DISEASES

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CHAPTER

54

An Approach to a Case of SARI in the Elderly

Nandini Chatterjee

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CASE VIGNETTE

A 70-year-old man presented with history of fever for the last 5 days with cough and expectoration. He came to the emergency with breathing difficulty since this morning on examination temperature 101.7°F, pulse 120 beats/min, respiratory rate 34 breaths/min, BP 100/65 mm Hg.

Chest scattered rhonchi bilaterally along with coarse crepitations at the lower right infra scapular area.

Other systemic examinations were noncontributory.

PROVISIONAL DIAGNOSIS

The patient is experiencing influenza-like illness (ILI), defined by the World Health Organization as an acute respiratory infection with a fever of 38°C or higher and a cough, starting within the past 10 days. If hospitalization becomes necessary, the illness is reclassified as a severe acute respiratory infection (SARI).

When do the patients require hospitalization?

The red flag signs are to be promptly recognized **(Fig. 1)**, e.g.:

- Difficulty in breathing or shortness of breath
- Persistent pain or pressure in the chest or abdomen
- Persistent dizziness, confusion, inability to arouse
- Seizures
- Diminished urine output

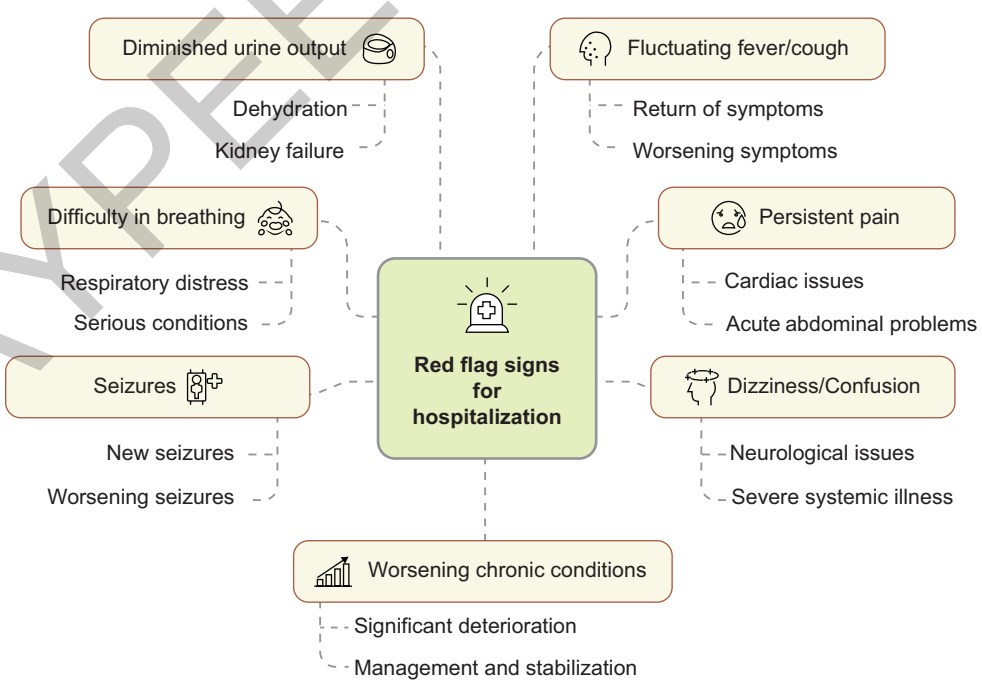

FIG. 1: Red flag signs for hospitalization in patients with severe acute respiratory infection (SARI).

- Fever or cough that improve but then return or worsen
- Worsening of chronic medical conditions

CURB-65 is a score for assessment of pneumonia patients and ascertain whether they require admission:

- Confusion (based upon a specific mental test or new disorientation to person, place, or time)
- Urea (blood urea nitrogen in the United States) >7 mmol/L (20 mg/dL)
- Respiratory rate ≥30 breaths/min
- Blood pressure (systolic <90 mm Hg or diastolic <60 mm Hg)
- Age ≥65 years

A score of 1 is assigned for each criterion. If the patient scores 2 or more, hospitalization is required, while scores of 3–5 typically indicate the need for intensive care unit admission.

The physicians' discretion is important here. The patients aged greater than 65 years are especially vulnerable.

DIFFERENTIAL DIAGNOSIS

Differential diagnosis for ILI is as follows in **(Table 1)**.

Noninfectious causes are essential mimickers that must be ruled out. Additionally, besides typical respiratory pathogens, diseases such as malaria, dengue, scrub typhus, leptospirosis, and even hepatitis viruses can sometimes present similarly to an acute respiratory infection.

CLINICAL APPROACH

- Clinical evaluation
- History is suggestive of the diagnosis.

TABLE 1: Influenza-like illness (ILI): Infectious versus noninfectious causes.

Infections	Noninfectious causes
• Influenza virus A/B • Rhinovirus • Respiratory syncytial virus • Adenovirus • Parainfluenza • COVID-19 • HSV • *Streptococcus pneumoniae* • *Mycoplasma* • *Legionella* • Malaria • Dengue • Scrub typhus • Leptospirosis • Hepatitis	• Acute hypersensitivity pneumonitis • SLE pneumonitis • Lung malignancy

- One has to look for red flag signs to ascertain prognosis and take decision regarding need for hospitalization:
  - Higher function
  - Respiratory rate
  - Pulse
  - BP
  - Cyanosis
  - Oxygen saturation
  - Systemic examination

Typically, ILI is mild and self-limiting, so investigations are often unnecessary. However, if the patient fails to improve or develops red flag signs, the following tests should be conducted:

- CBC with PBS
- MPDA
- NS1 antigen
- RT-PCR for COVID-19
- Sputum for stain and culture
- Urine RE/ME
- Chest X-ray PA view
- Blood/Urine culture
- LFT/RFT/Electrolytes/ABG
- Typhidot IgM, scrub typhus IgM/*Leptospira* IgM
- Test for influenza (PCR from nasopharyngeal, oropharyngeal swab) is done if results will change clinical management or for surveillance

PATHOPHYSIOLOGY

- *Pathogen entry and initial infection*: Pathogens usually enter the respiratory tract through inhaled droplets, direct contact, or fomites, and then attach to and invade the epithelial cells lining the tract using specific host cell receptors.
- *Immune response and inflammation:* The initial immune response activates innate immune cells (like macrophages and neutrophils) and releases proinflammatory cytokines (e.g., IL-1, IL-6, TNF-α). This causes inflammation, increasing vascular permeability, leading to edema and immune cell infiltration in the lungs, along with the release of reactive oxygen species (ROS) and proteases that further damage tissues.
- *Damage to respiratory epithelium*: The pathogen and inflammatory response damage the respiratory epithelial cells, causing cell death and disrupting the mucociliary escalator. This impairs pathogen clearance, increases susceptibility to secondary infections, and allows fluids and proteins to leak into the alveolar space.
- *Altered gas exchange*: Fluid accumulation in the alveoli and interstitial spaces impairs oxygen and carbon dioxide exchange, leading to reduced blood oxygen levels (hypoxemia) and increased carbon dioxide levels (hypercapnia). This can result in respiratory distress and potentially lead to organ failure **(Fig. 2)**.

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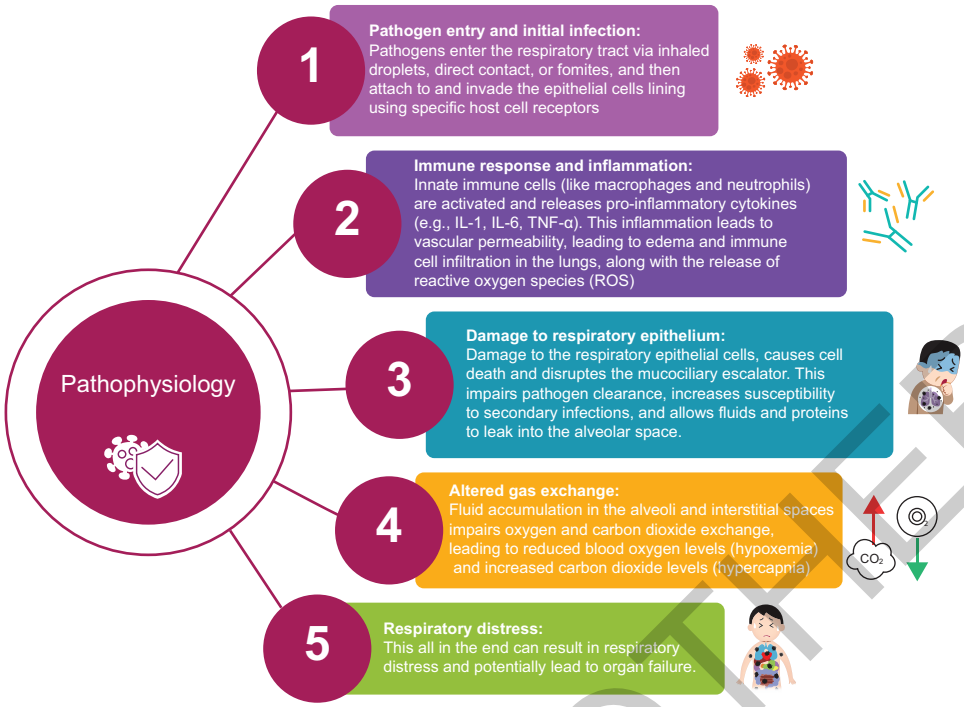

FIG. 2: Pathophysiology of severe acute respiratory infection (SARI).

TREATMENT

Before initiating therapy, it is important to assess the duration of the illness to determine the therapeutic window. Additionally, the disease severity—whether mild or severe, progressive, or complicated—must be evaluated. Treatment should be tailored based on the specific etiology of SARI, requiring an individualized approach. Mild ILI should be managed with oral fluids, rest, and home isolation. Acetaminophen or ibuprofen may be used for symptom relief, but salicylates, including aspirin, are contraindicated.

Patients at higher risk of complications are:

- *Age*: <2 years, >65 years
- *Comorbidity*: Hypertension, diabetes mellitus, COPD/asthma, chronic kidney disease, chronic liver disease, malignancy or connective tissue disorders
- *Addiction*: Smoking, alcoholism
- Pregnancy

For SARI patients:

- Admission in ITU
- IV fluids are to be started.
- Oxygen therapy is given if SO_2 <90%, and mechanical ventilation if not corrected by O_2, drowsiness, or respiratory failure
- Ibuprofen/paracetamol/nutrition/electrolyte balance/circulation are to be maintained.
- For hospitalized patients with suspected or confirmed influenza, initiation of antiviral treatment with oral or enterically administered oseltamivir is recommended as soon as possible. Dosage 75 mg BD for 5 days.
- If the clinical course remains severe or progressive, the duration of the antiviral treatment is recommended to be extended longer.
- All patients at higher risk for influenza complications or worsening of comorbidities also to be given oseltamivir.

Combination antiviral therapy is generally not recommended for severe influenza. However, for patients with severe influenza complicated by pneumonia, otitis media, or sinusitis, a treatment regimen including both an antibiotic and an antiviral agent is advised. *However, the specific treatment is to be given if etiology is ascertained with investigations.*

If a bacterial infection is detected, antibiotics such as ampicillin/sulbactam, amoxicillin/clavulanate, third-generation cephalosporins, and respiratory quinolones, which are effective against *Staphylococcus aureus, Streptococcus pneumoniae, Streptococcus pyogenes, Moraxella catarrhalis*, and *Haemophilus influenzae*, should be used. Systemic corticosteroids are not recommended for treating severe influenza, except in cases where their therapeutic benefit is well-established, such as in asthma, COPD, and adrenal insufficiency.

PREVENTION

- Regular hand washing with proper drying of the hands
- Good respiratory hygiene—covering mouth and nose when coughing or sneezing, using tissues and disposing of them correctly
- Early self-isolation of those feeling unwell, feverish and having other symptoms of influenza

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- Avoiding close contact with sick people
- Avoid touching one's eyes, nose or mouth.

Immunization

The national guidelines for adult immunization recommend influenza and pneumonia vaccinations for individuals over 65 years of age.

For Influenza

There are two types of vaccines:

1. *Inactivated vaccine*: Trivalent and quadrivalent (preferred), available in split virion and subunit types. Administered via IM injection in the deltoid, 0.5 mL once a year.
2. *Live attenuated vaccine*: Intranasal spray (LAIV4).

Timing

For adults, only one annual dose of the influenza vaccine is recommended. In India, the peak influenza season occurs during the monsoon, so the vaccine should be administered before the monsoon, ideally in April–May. For adults aged ≥65 years, the recommended vaccines include the quadrivalent high-dose inactivated influenza vaccine (HD-IIV4), quadrivalent recombinant influenza vaccine (RIV4), or quadrivalent adjuvanted inactivated influenza vaccine (aIIV4). If these are not available, any other age-appropriate influenza vaccine can be used.

Pneumococcal Vaccine

There are two types of pneumococcal vaccines:

1. *PPSV23 (pneumococcal polysaccharide vaccine):* It contains capsular polysaccharides from 23 serotypes of *Streptococcus pneumoniae*.
2. *PCV13 (pneumococcal conjugate vaccine)*: It contains 13 serotypes of *Streptococcus pneumoniae*.

Dosing

- In healthy individuals over 65 years of age, only one dose of PPSV23 is recommended.
- In immunocompetent individuals with comorbidities, one dose of PPSV23 should be given, followed by PCV13 after 5 years, based on shared clinical decision-making, only if there is a high risk of pneumococcal infection.
- In immunocompromised patients with comorbidities, PCV13 should be given first, followed by PPSV23 after 8 weeks, and another dose of PPSV23 after 5 years.

What are the Complications of SARI?

- Ear infections
- Sinus infections
- Bronchitis
- Pneumonia
- Encephalopathy/Encephalitis
- Myocarditis
- Sepsis, MOF, shock
- Worsening of chronic medical conditions

Points to Ponder

- *Pathogens:* SARIs are caused by viruses like influenza, RSV, and coronaviruses. Understanding the specific pathogen is crucial for targeted treatment and control measures.
- *Global burden*: High morbidity and mortality, particularly affecting healthcare systems during peak seasons especially in low-resource settings.
- *Preparedness:* Requires stockpiling, healthcare training, and community awareness for outbreaks.
- *Surveillance*: Timely diagnosis is vital for managing SARIs. Systems like WHO's SARI surveillance enable early detection and response.
- *At-risk populations*: Especially impacts children, elderly, and immunocompromised individuals. Prevention strategies often focus on these high-risk populations to reduce severe outcomes.
- *Vaccination*: Influenza vaccines are crucial for prevention. Expanding vaccination coverage, especially in vulnerable groups, is a priority for reducing the incidence and severity of SARIs.
- *Treatment challenges*: Limited effective antivirals; supportive care remains primary. Managing SARIs involves supportive care, oxygen therapy, and sometimes antiviral medications, depending on the pathogen.
- *Antimicrobial stewardship*: Essential to manage bacterial superinfections and reduce resistance. Implementing antimicrobial stewardship programs is essential to prevent antibiotic resistance, growing global health concern.
- *COVID-19 impact*: Boosted research on SARIs and highlighted preparedness gaps.

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MULTIPLE CHOICE QUESTIONS

1. What is a common clinical sign of severe acute respiratory infection?

A. Bradycardia
B. Hyperthermia
C. Hypertension
D. Hypoglycemia

2. Which symptom is typically associated with severe acute respiratory infections?

A. Persistent headache
B. Severe dyspnea
C. Abdominal pain
D. Joint pain

3. **Which of the following is a recommended preventive measure for severe acute respiratory infections?**
   A. Frequent hand washing and respiratory hygiene
   B. Increased dietary intake of carbohydrates
   C. Regular use of antihypertensive medications
   D. Avoidance of high-fat foods
4. **Which diagnostic test is most useful for identifying bacterial pathogens in severe acute respiratory infections?**
   A. Sputum culture
   B. Complete blood count (CBC)
   C. Liver function test
   D. Serum electrolytes
5. **What is the role of corticosteroids in treating severe acute respiratory infections?**
   A. To treat bacterial infections
   B. To reduce inflammation and immune response
   C. To manage electrolyte imbalances
   D. To enhance fluid balance

Answers

1. (B); 2. (B); 3. (A); 4. (A); 5. (B)

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A Clinical Compendium of Medicine 2026

"A Clinical Compendium of Medicine 2026", 2nd edition aims to deliver a case-based approach to disease management, including sections on diagnosis, pathophysiology, treatment, and self-evaluation through MCQs. New problem-based chapters have been added for more comprehensive coverage of medical dilemmas.

Salient Features

- **Comprehensive case-based approach:** This edition emphasizes a case-based methodology, presenting real-world scenarios to enhance understanding and application of clinical knowledge in managing various diseases.
- **Structured format:** Each case is systematically organized, covering key aspects such as diagnosis, pathophysiology, treatment, and management strategies.
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Jyotirmoy Pal MD(General Medicine) FRCP FICP FACP WHO Fellow is Professor of General Medicine at University College of Medicine and Sagore Datta Medical College, Kamarhati, West Bengal, India. He is the President of Association of Physicians of India (API). His fields of interest are infectious and tropical diseases and geriatric medical and public health. In the last 21 years, he has published more than 90 research articles in national and international indexed journals. He served as a Secretary and an Editor for the Journal of Indian Medical Association (JIMA). He contributed chapters in more than 30 books and is the Editor of Monograph Dengue, Clinical Methods in Respiratory Medicine, and Mucormycosis, Tropical Fever, and General Practice: An Approach to Differential Diagnosis. He is also the Editor-in-Chief, MacMaster Textbook of Internal Medicine, South-Asian Edition. He has been a member of the Expert Committee on COVID Care, Dengue Management, Department of Health and Family Welfare, Government of West Bengal.

Nandini Chatterjee MD FRCP(Glasgow, London) FICP is working as Professor, Department of Medicine at IPGMER and SSKM Hospital, Kolkata, West Bengal, India. She has 20 years of teaching experience, and her field of interest is tropical diseases. She has published over 80 research articles in different national and international indexed journals. She has previously served as an Editor for the Journal of the Indian Medical Association (JIMA) and presently serves as the Editor-in-Chief of the Bengal Physician Journal (Association of Physicians of India) as well as Executive Editor of API Journal of Case reports. She has been an invited author of different books—API Textbook of Medicine, Medicine Update, Eye in Systemic Diseases, 100 Best Cases in India, COVID 2nd Wave, etc. She is also the Editor of Mucormycosis and co-Editor-in-Chief of McMaster Textbook of Internal Medicine, South-Asian Edition, Tropical Fever, and Dengue, 3rd edition, An Approach to Differential Diagnosis.

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