

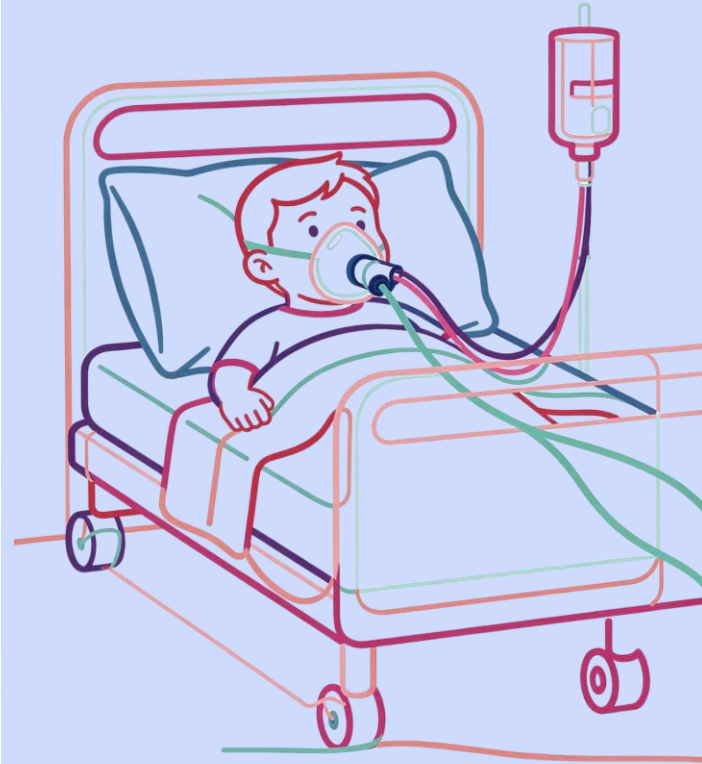
Acute Respiratory Distress in Children: Oxygen Escalation

By **Reza Yazdan Panah**

Supervised by **Dr. Amir Naghshzan** (AmirNaghshzan@gmail.com)

CONDITION

ACUTE RESPIRATORY DISTRESS - OXYGEN ESCALATION



Brief Report

Acute respiratory distress is a common and potentially life-threatening pediatric emergency.

It presents with **rapid breathing difficulty**, **increased work of breathing**, and **decreased oxygen saturation**. Prompt identification and proper oxygen escalation are critical because children deteriorate faster than adults.

Rapid Onset

Children deteriorate significantly faster than adults, demanding immediate action.

Key Presentation

Breathing difficulty, increased work of breathing, and falling oxygen saturation.

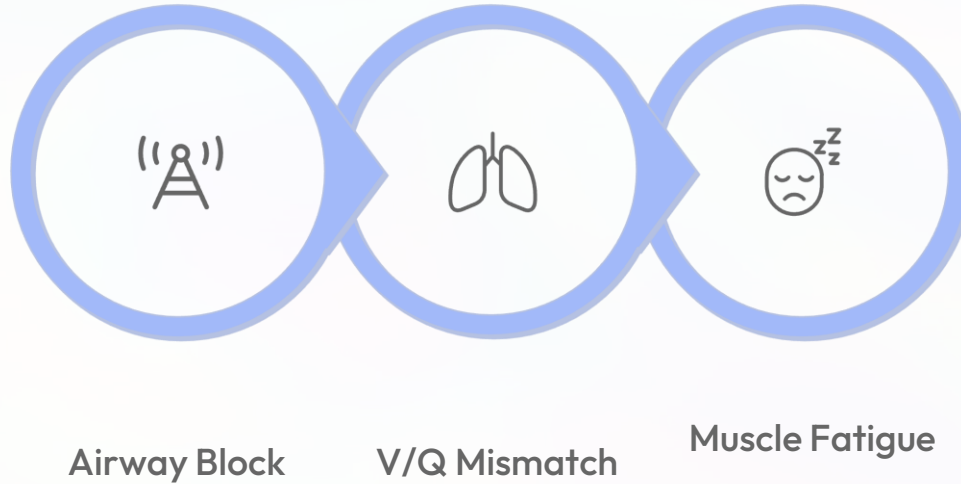
Critical Priority

Prompt identification and stepwise oxygen escalation are life-saving interventions.



Pathophysiology

Understanding the mechanism of acute respiratory distress helps guide timely and effective intervention.



As the cascade progresses from impaired gas exchange to hypoxemia and ultimately respiratory muscle fatigue, the window for intervention narrows rapidly — making early recognition and escalation essential.

Clinical Features

Respiratory Signs to Recognize

1

Tachypnea

Abnormally rapid breathing rate — often the earliest and most sensitive sign of distress.

2

Nasal Flaring

Widening of the nostrils during breathing, indicating increased respiratory effort.

3

Chest Retractions

Intercostal, subcostal, and suprasternal retractions signal significant work of breathing.

4

Grunting

Expiratory grunting reflects the child's attempt to maintain positive end-expiratory pressure.

Stridor

High-pitched inspiratory noise indicating **upper airway obstruction** — requires urgent assessment.

Wheezing & Cyanosis

Wheezing suggests lower airway obstruction. **Cyanosis** is a late and ominous sign indicating severe hypoxemia.



Risk Factors

Several underlying conditions and exposures significantly increase a child's vulnerability to acute respiratory distress.



Prematurity & Chronic Lung Disease

Underdeveloped lungs and pre-existing pulmonary conditions reduce respiratory reserve.



Pneumonia

Both bacterial and viral pneumonia cause alveolar consolidation and impaired gas exchange.



Congenital Heart Disease

Structural cardiac defects can cause pulmonary congestion and secondary respiratory compromise.



Viral Infections

RSV bronchiolitis and influenza are leading triggers of acute respiratory deterioration in children.



Asthma / Reactive Airway

Bronchospasm and airway inflammation lead to significant lower airway obstruction.



Immunodeficiency & Neuromuscular

Impaired immunity increases infection risk; neuromuscular disorders reduce effective airway clearance.

⚠️ Aspiration risk is elevated in children with GERD, seizures, or developmental delays — always assess swallowing safety.

Management

A structured, stepwise approach is essential to stabilize the child and prevent progression to respiratory failure.

1 Rapid Assessment

Evaluate airway, breathing, circulation, mental status, and oxygen saturation immediately upon presentation.

2 Stepwise Oxygen Escalation

Progress from **nasal cannula** → **face mask** → **non-rebreather mask** → **HFNC** → **CPAP/BiPAP** → **intubation** only if all prior steps are insufficient.

3 Treat the Underlying Cause

Pneumonia → antibiotics · Asthma → bronchodilators + steroids · Bronchiolitis → supportive care · Sepsis → fluids + antibiotics.

4 Continuous Monitoring

Monitor SpO₂, work of breathing, vital signs, and blood gases continuously in severe cases.



Key Home Message



Medical Emergency

Acute respiratory distress in children is a medical emergency that **progresses rapidly** — every minute counts.



Early Recognition

Identify signs early: **tachypnea, retractions, and low oxygen saturation** are the critical warning triad.



Stepwise Escalation

Oxygen therapy must be escalated in a stepwise manner — begin with low-flow methods and progress to advanced support as needed.



Prevent Intubation

High-flow oxygen and non-invasive ventilation **can prevent intubation** if applied early and appropriately.



Treat the Cause

Management must always include **treating the underlying cause** while simultaneously supporting breathing.



Reference: Essential Nelson Pediatrics, 9th Edition