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APRIL 27 – APRIL 29, 2026
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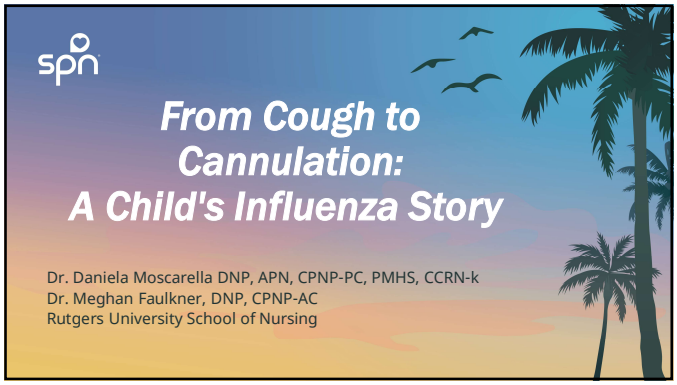
From Cough to Cannulation:
A Child's Influenza Story
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Dr. Meghan Faulkner, DNP, CPNP-AC
Rutgers University School of Nursing

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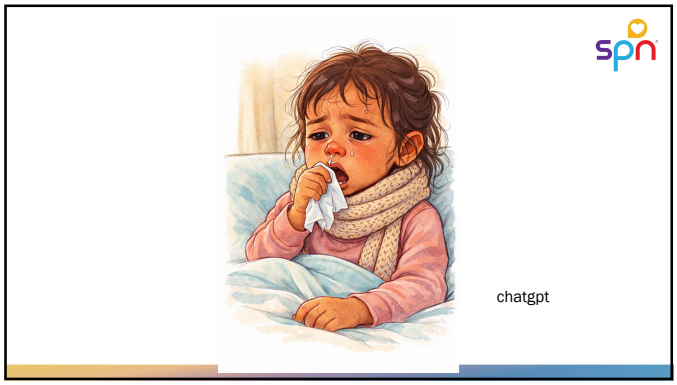

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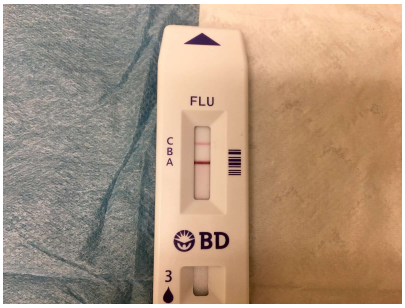

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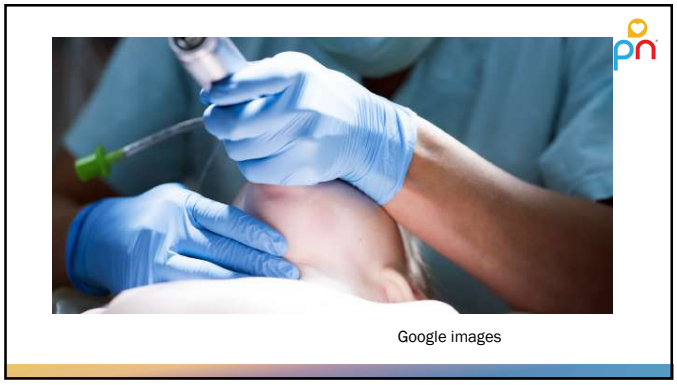

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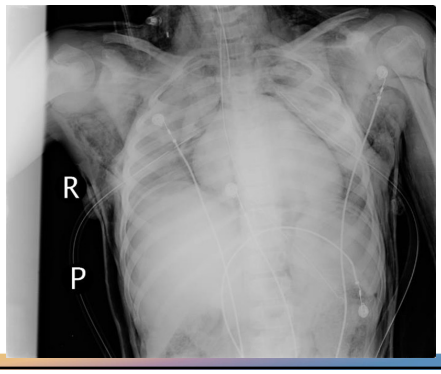

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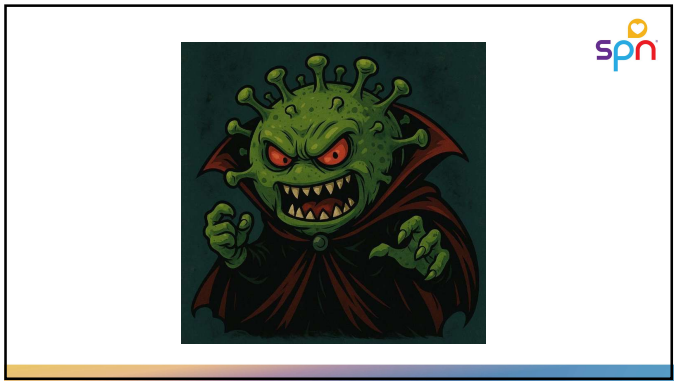

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FENTANYL
INJECTION
IV USE ONLY
PERAMIVIR
Injection
VANCOMYCIN
For Intravenous
Use
MEROPENEM

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Objectives

By the end of this session, participants will be able to:
1. Recognize early clinical features, progression patterns, and potential complications of key respiratory pathogens, including influenza, RSV, COVID-19, and viral co-infections.
2. Apply evidence-based strategies for diagnosis, risk stratification, and outpatient versus inpatient management of respiratory illnesses, including the use of antivirals, monoclonal antibodies, and supportive care.
3. Identify risk factors that predispose patients to severe disease, hospitalization, or the need for advanced interventions such as mechanical ventilation and ECMO.
4. Interpret current CDC and WHO surveillance data and epidemiologic trends to anticipate local and regional respiratory season impacts.
5. Develop and implement strategies to enhance respiratory illness prevention, including vaccination campaigns, RSV prophylaxis, and community-based health initiatives.

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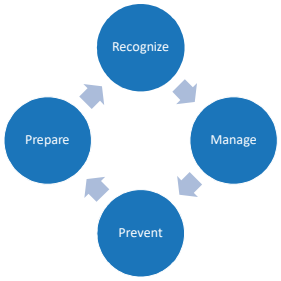
Riding the Wave: the 2025-2026 Respiratory Season



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CDC & WHO Respiratory Pathogen Trends

- Influenza
- RSV
- COVID

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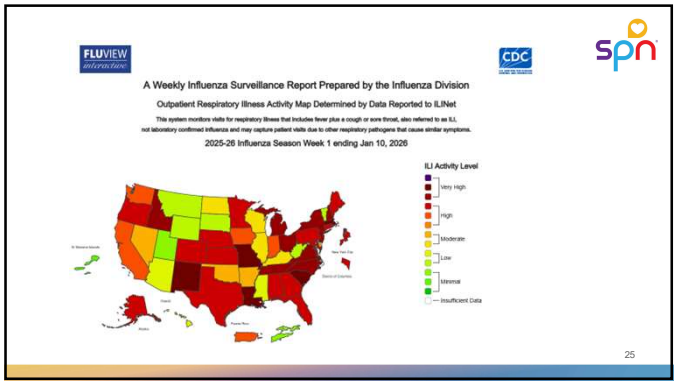

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Influenza Facts & Strains

- Season
  - October to March
  - Peaks January – March
- Transmission
  - Droplet, Contact, Aerosol
- Incubation
  - 1-4 days
- Clinical Presentation
  - Nonspecific febrile illness
  - Pharyngitis
  - Upper respiratory symptoms
  - GI Symptoms
    - Vomiting, diarrhea, abdominal pain

- Types A, B, & C (Rare)
  - Then classified into subtypes
  - H1N1, H3N2
- 89% of influenza viruses were Influenza A in 2025 endemic
- Avian Influenza (H5N1)
  - Consider exposure to wildlife/ birds/cattle
- Influenza A (H3N2 Subclade K): New Strain

(Wolf & Antoon, 2025)

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What happened in 2024-2025?

- This season was a high-severity season
  - First since 2017-2018
- CDC estimated the burden of disease of all ages to be:
  - 47 to 82 million illnesses
  - 21 to 37 million influenza related medical visits
  - 610,000 to 1.3 million flu related hospitalizations (GLOBALLY)
  - Adult deaths: 28,000
- A total of 289 influenza-associated pediatric deaths reported
  - 90% of these children were not fully vaccinated against influenza
  - 42% occurred in children without a high-risk medical condition

(AAP, 2025; CDC, 2025; Wolf & Antoon, 2023)

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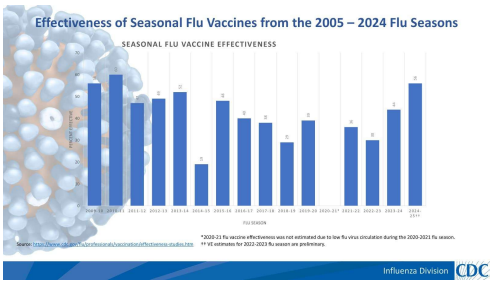
Flu Vaccine Effectiveness



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Preliminary 2025 - 2026 U.S. Flu In-Season Disease Burden Estimates

Since October 1, 2025, CDC estimates there have been between:

Flu Illnesses	Flu Medical Visits	Flu Hospitalizations	Flu Deaths
30 Million - 54 Million	14 Million - 24 Million	370,000 - 770,000	23,000 - 76,000

Based on data from October 1, 2025, through March 28, 2026

Because influenza surveillance does not capture all cases of flu, CDC provides these estimated ranges to better reflect the full burden of flu in the United States. These estimates are calculated using a mathematical model based on CDC's weekly influenza surveillance data and are preliminary and are updated weekly throughout the season.

FluVIEW CDC

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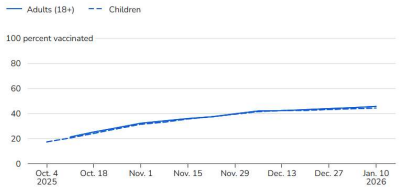
Current Vaccine Rates and Effectiveness



- Early estimates 40-60% efficacy against strains like H3N2
- Significant benefits against complications and hospitalizations

Vaccine Hesitancy and Inequity

- Through April 26, 2025, only 49.2% of children 6 months – 17 years had been vaccinated for influenza
  - 14.5 % lower than at the end of 2020
  - SDOH inequities large component
    - Disparities in vaccine access and delivery
    - Vaccine hesitancy
- Racial disparities
  - Higher rates of hospitalizations and in-hospital deaths in Black, Hispanic, and Asian/ Pacific Islander children

(AAP, 2025; CDC, 2025; Wolf & Antoon, 2023)

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Implications for Children

- Children consistently have highest attack rates during seasonal epidemics
- Higher risk for morbidity and mortality
  - Age <5 years
  - Underlying medical conditions
  - Prematurity
  - Resides in a chronic care facility
  - Chronic Pulmonary disease
  - Cardiovascular disease
  - Kidney disease
  - Immunosuppression
  - Extreme obesity
- Causes as many as 10% of all pediatric hospitalizations during the winter season
- 2026: 128 Pediatric Flu Related deaths
  - 90% unvaccinated

(AAP, 2025; Wolf & Antoon, 2023)

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The Ugly Side of Flu

- Encephalitis
- Myocarditis
- Pericarditis
- Myositis
- Rhabdomyolysis
- Necrotizing Pneumonia
- Bacteremia

Image created using chatgpt.com

(AAP, 2025; CDC, 2025)

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Acute Necrotizing Encephalopathy (ANE)

- Severe form of influenza-associated encephalopathy (IAE) or encephalitis
  - 9 Pediatric-related deaths with IAE in 2025
- Preceding fever with rapid neurologic deterioration
- Clinical symptoms
  - Seizures
  - Altered mental status, Decreased LOC, delirium
  - Lethargy, hallucinations
- Imaging
  - Bilateral symmetric lesions affecting the thalami or other parts of the brain
  - Edema
- Treatment
  - Supportive, encephalitis management


Morbidity and Mortality Weekly Report

Reports of Encephalopathy Among Children with Influenza-Associated Mortality — United States, 2010–11 Through 2024–25 Influenza Seasons

(CDC, 2025; US Department of Health and Human Services, 2025)

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AAP Recommendations: 2025-2026 Policy Statement: Vaccines

- AAP Recommends annual influenza vaccination of all children without medical contraindications starting at 6 months of age.
  - Reduces risk for hospitalization and reduces overall burden of respiratory illness
    - Should occur as soon as vaccine is available
    - All children should be vaccinated by October of season
- Live attenuated vaccines should not be used for immunocompromised persons/persons with chronic conditions
  - Intranasal vaccine
- Evaluate for history of severe allergic reaction or egg allergy
- AAP Flu Toolkit

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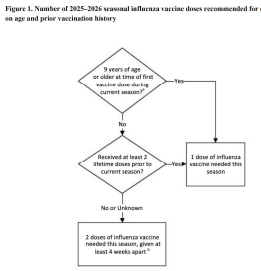

Figure 1. Number of 2025–2026 seasonal influenza vaccine doses recommended for children based on age and prior vaccination history

[a] Must be at least 6 months of age to be eligible for influenza vaccine.
[b] Second dose still required for children who turn 9 between first and second dose.

(AAP, 2025)

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Live Attenuated (Intranasal) Vaccine

- Available for home use for eligible patients >2 years of age
- NOT available to any patient who is high risk or immunocompromised
- May be administered at home by a caregiver

(AAP, 2025)

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Influenza Testing

- At home tests
- In hospital viral PCRs
- COVID/Flu Combination Assays

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Antiviral Treatment

Role depends on illness severity and risk for complications

Best results observed when person is treated within 48 hours of onset

Consider side effects: gastrointestinal intolerance, hallucinations, seizure

Drug	Route	Pediatric Considerations
Oseltamivir (Tamiflu)	Enterally	Only drug recommended by AAP for hospitalized children – 14 days or older
Zanamivir (Relenza)	Inhaled	Must consider ability to use inhaler
Peramivir (Rapivab)	Intravenous	Must be used in children 6 months and older – symptomatic no more than 2 days
Baloxavir (Xofluza)	Enteral (single dose)	Children ≥5 years of age; all individuals 12 years and older

(AAP, 2025; Abdelaziz et al., 2025; Byun et al., 2024)

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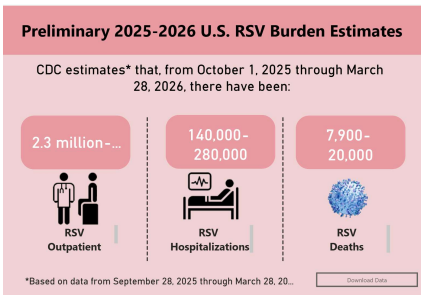
Respiratory Syncytial Virus (RSV)



(https://www.cdc.gov/rsv/php/surveillance/burden-estimates.html)

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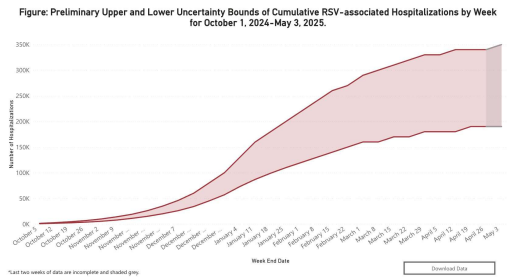
Peak Season



(Pediatrics, 2025)

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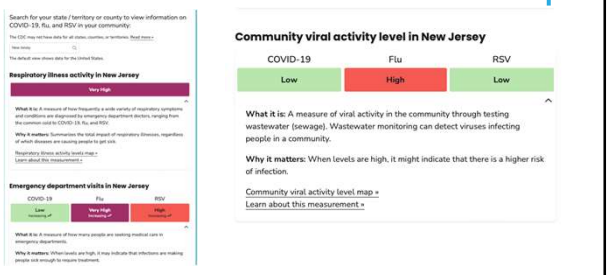
Your Community Snapshot at CDC.org



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RSV

Risk

- Pre-mature infants
- Pre-existing conditions
  - Cardiac
  - Pulmonary
  - Neurologic

Signs and Symptoms

- Fever (greater than 100.4)
- Cough (loose staccato)
- Rhinorrhea
- Congestion
- Difficulty/ poor feeding
- Tachypnea
- Nasal Flare/ grunting
- Cyanosis and apnea
- Expiratory wheeze

(Cardo McKegney & Quinn, 2025)

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Table 1
Common management of the RSV patient in the primary care setting

Considerations from the AAP Clinical Practice Guidelines	
Management Options	**Rationale**
Hydration	• Breastfeeding and bottle-feeding should be encouraged in small frequent feeds to ensure adequate hydration at home • Fluid replacement often is necessary when dehydration occurs secondary to difficulty breathing. Infants who are consuming <50% of their normal fluid intake may need nasogastric feeding
Antipyretics	• The use of antipyretic in the presence of fever of 100.4°F great for comfort is recommended
Saline nasal drops and nasal suctioning	• Simple nasal irrigation with frequent superficial suctioning can reduce the build of nasal mucus and improve work of breathing[4]
Oxygen therapy	• Apnea and decreased oxygenation are commonly seen in moderate-to-severe RSV bronchiolitis • Infants who maintain a Pa_2 of <82% and increased work of breathing should be considered for supplemental oxygen • Preferred method of oxygen supplementation is via high flow nasal cannula and or continuous positive pressure[4]
Radiographs	• Chest radiographs are not routinely suggested in the diagnosis and management of RSV bronchiolitis
Bronchodilators, prolonged epinephrine, corticosteroids, and chest physiotherapy	• Most acute RSV bronchiolitis patients do not show any improvement in wheezing with the use of these therapies • These management options are noted to improve airway function in the asthmatic; however, they do not improve lung function or shorten the course of the illness when compared to hydration, inhaled saline solution, and supplemental oxygen when indicated
Antibiotics	• Antibiotics are not indicated in the treatment of RSV bronchiolitis • When comorbid infection such as an acute otitis media and or pneumonia are suspected then antibiotic therapy is warranted

Ralston et al (2014).[4]

(Cardo McKegney & Quinn, 2025)

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AAP Prevention Guidelines

Table 2
Summary of current secondary prophylaxis for respiratory syncytial virus for maternal child protection

Immunization Approach		Generic *Trade Name*	Considerations
Maternal vaccination	Bivalent RSVpreF vaccine	RSV vaccine *Abrysvo*	• Single dose during 32–36 wk of pregnancy • September through January • Offers protection of the neonate from birth
mAbs	Short-acting mAb	Palivizumab *Synagis* (Sweden)	• Infants born <29 wk and aged 12 mo or younger at the beginning of RSV season • Comorbidities: cardiac and respiratory cardiovascular • 5 intramuscular doses • Increased cost
	Long-acting mAb	Nirsevimab-alip *Beyfortus* (Sweeden)	• Available to all newborns in their first RSV season • One intramuscular dose • Rapid and direct protection • Provides at least 5 mo of protection
Pediatric vaccines	Not universally available		• In clinical trials for older infants and children

(Cardo McKegney & Quinn, 2025)

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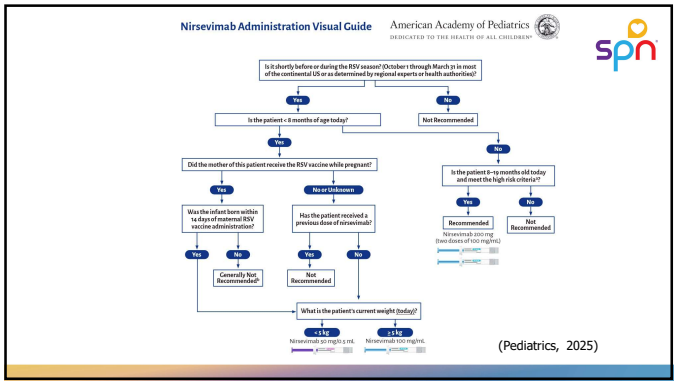

(Pediatrics, 2025)

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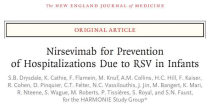
Preventing Complications



Data from the VISION Multi-Site Network of Electronic Health Records of 160 emergency departments and 131 hospitals showed nirsevimab was 63% effective at preventing RSV-associated ED encounters and 79% effective at preventing RSV-associated hospitalization (AAP.org, 2025)

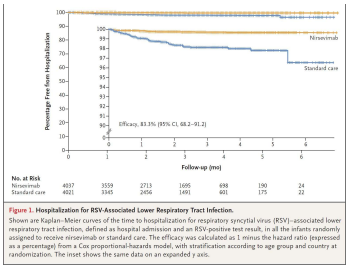


Figure 1. Hospitalization for RSV-Associated Lower Respiratory Tract Infection.
Shown are Kaplan–Meier curves of the time to hospitalization for respiratory syncytial virus (RSV)–associated lower respiratory tract infection, defined as hospital admission and an RSV-positive test result, in all the infants randomly assigned to receive nirsevimab or standard care. The efficacy was calculated as 1 minus the hazard ratio (expressed as a percentage) from a Cox proportional-hazards model, with stratification according to age group and country at randomization. The inset shows the same data on an expanded y axis.

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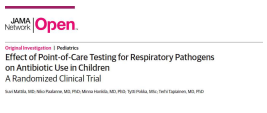
Point of Care Testing (POCT)

- Not useful in the outpatient setting
  - Parental push is strong
- JAMA study concluded did not reduce use of antibiotics in the ED
- Limited impact on clinical decision making



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Acute Care Management

- Hospitalization
  - Hypoxia
  - Respiratory Insufficiency
  - Acute Respiratory Failure
- Management Strategies
  - Supplemental oxygen
    - High Flow Nasal Cannula (HFNC)
  - Frequent suctioning
  - Non-Invasive Ventilation

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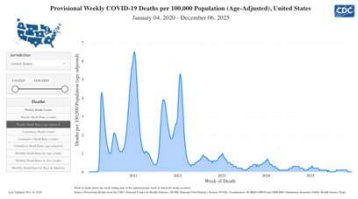
COVID-19

- SARS-CoV-2 infections mild
- New prevention and treatment



(CDC, 2025)

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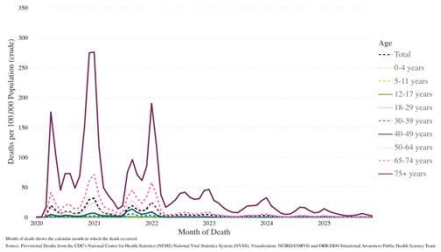
Covid-19 Deaths per 100,000 Population by age



(CDC, 2026)

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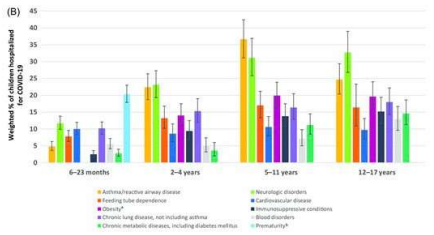
COVID-19

RISK

- Asthma/ RAD
- Feeding Tube
- Obesity
- Chronic lung
- Metabolic disorder
- Neurologic
- CV
- Immunosuppressive disorders
- Blood Disorders
- Prematurity



(Free et al, 2025)

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Signs and Symptoms

- Fever
- Cough
- Shortness of breath
- Sore throat
- Rhinorrhea/ congestion
- Anorexia
- N/V/D
- Headache
- Muscle aches
- Fatigue
- Irritability

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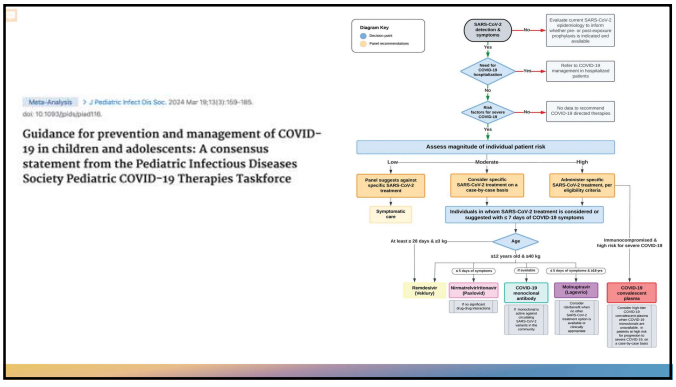

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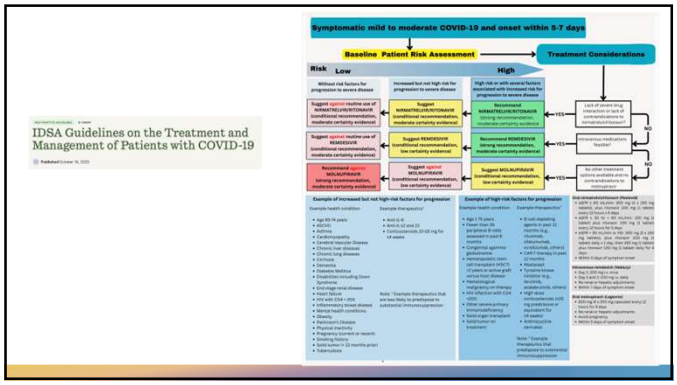

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Pediatric Prevention Through Vaccines

Infants and Children 6-23 months at high risk should receive the series

Children 6m-18 years immunocompromised require 2 or more doses, depending on previous status

Single age-appropriate dose for all children in specific risk groups

Children 2-18 years a single dose after last was received at least 8 weeks ago

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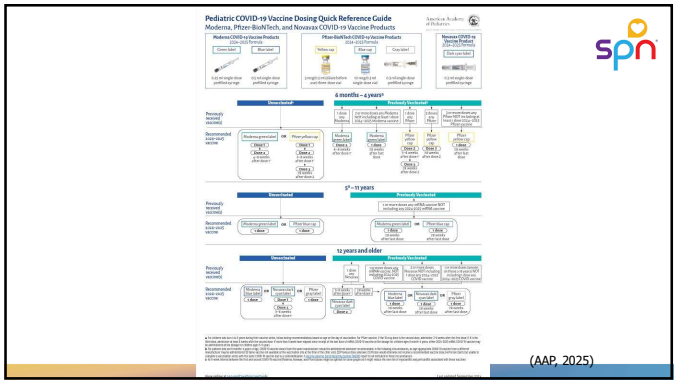

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Available Covid-19 Vaccines

Vaccine	Can be given to:
2025–2026 Moderna COVID-19 Vaccine: Spikevax	Anyone ages 6 months and older
2025–2026 Moderna COVID-19 Vaccine: mNexspike	Anyone ages 12 years and older
2025–2026 Pfizer-BioNTech COVID-19 Vaccine: Comirnaty	Anyone ages 5 years and older
2025–2026 Novavax COVID-19 Vaccine: Nuvaxovid	Anyone ages 12 years and older

(CDC, 2026)

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Taking Action: Vaccines for Children (VFC) Program

- Provides free vaccines to underserved children
- Funded by CMS

(CDC.gov, 2025)

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Questions?

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