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Committee on Infectious Diseases

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AMERICAN ACADEMY OF PEDIATRICS

TECHNICAL REPORT

# Recommendations for COVID-19 Vaccines in Infants, Children, and Adolescents, 2026–2027: Technical Report

Committee on Infectious Diseases

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*All authors contributed substantially to the conception and design; review and interpretation of relevant literature; drafting and revisions; and final approval of the published version.*

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**ABSTRACT. This technical report accompanies the American Academy of Pediatrics policy statement recommendations for COVID-19 vaccination during the 2026–2027 respiratory virus season. The rationale is presented for recommending vaccination in all infants and children 6 through 23 months of age, children 6 months through 18 years of age who are moderately or severely immunocompromised, and children 2 through 18 years of age in certain additional risk groups, including those at high risk of severe COVID-19, residents of long-term care facilities or other congregate settings, children who have never been vaccinated against COVID-19, and children whose household contacts are at high risk for severe COVID-19. The report synthesizes currently available evidence on SARS-CoV-2 epidemiology, disease burden, COVID-19 vaccine**

**effectiveness, vaccine safety, and vaccine cost-effectiveness in pediatric populations. Additionally, the report provides an overview of available COVID-19 vaccine products, formulations, storage and handling considerations, and coadministration with other immunizations.**

ABBREVIATIONS: aRR, adjusted risk ratio; AAP, American Academy of Pediatrics; CDC, Centers for Disease Control and Prevention; CI, confidence interval; COID, Committee on Infectious Diseases; ED, emergency department; FDA, US Food and Drug Administration; COVID-NET, COVID-19 Hospitalization Surveillance Network; GBS, Guillain-Barré syndrome; ICU, intensive care unit; ITP, immune thrombocytopenia; mRNA, messenger RNA; RR, risk ratio; UC, urgent care; UV, ultraviolet; VAERS, Vaccine Adverse Event Reporting System; VE, vaccine effectiveness; VISION, Virtual SARS-CoV-2, Influenza, and Other respiratory viruses Network; VSD, Vaccine Safety Datalink.

## INTRODUCTION

This technical report accompanies the policy statement recommendations of the American Academy of Pediatrics (AAP) for the routine use of the COVID-19 vaccine in the prevention of COVID-19 in infants, children, and adolescents during the 2026–2027 respiratory virus season.[1]

## METHODOLOGY

This technical report and the accompanying policy statement were developed by the AAP Committee on Infectious Diseases (COID) to inform recommendations for COVID-19 vaccination during the 2026–2027 respiratory virus season. The COID convened a COVID-19 subgroup consisting of COID members and external experts with relevant expertise to review evidence and develop proposed recommendations. Recommendation development was informed, in part, through evidence reviews and scientific updates provided through the Vaccine Integrity Project process, which involved collaboration with medical professional societies and other organizations, including the American Medical Association and the Council on Medical Specialty Societies.

To guide the evidence review process, the subgroup developed priority clinical questions and evaluated available evidence addressing those questions, including evidence related to SARS-CoV-2 epidemiology, COVID-19 burden, vaccine effectiveness (VE), vaccine safety, and cost-effectiveness. Priority was given to evidence specific to infants, children, and adolescents and to the most recent available data reflecting the current epidemiologic context whenever possible. Sources reviewed included peer-reviewed literature, public health surveillance data, vaccine safety monitoring reports, guidance from professional organizations, and other relevant evidence. Recommendation development was further informed by considerations of domains within the Evidence to Recommendations framework.[2]

All participants submitted conflict of interest disclosures, and individuals with relevant conflicts recused themselves from deliberation and voting in accordance with AAP policies. Recommendations and supporting evidence were reviewed and deliberated by the COID, and eligible COID members voted on proposed recommendations. Approved recommendations were incorporated into the accompanying policy statement and technical report. The AAP continues to monitor emerging data related to COVID-19 and may update recommendations as additional evidence becomes available. Additional information about the 2026-2027 AAP immunization recommendation development process can be found at https://www.aap.org/en/patient-care/immunizations/aap-immunization-recommendations-process-2026/.

## SUMMARY OF RECENT SARS-CoV-2 ACTIVITY IN THE UNITED STATES

SARS-CoV-2, the virus that causes COVID-19, continues to circulate globally. However, activity levels during the 2025–2026 respiratory virus season, thus far, have remained lower than those observed during the same periods in recent respiratory seasons.[3] As of spring 2026, all World Health Organization (WHO) regions, including the Americas, reported lower SARS-CoV-2 test positivity rates compared with previous seasons.[3] Importantly, these data must be interpreted in the context of ongoing limitations in SARS-CoV-2 reporting and surveillance.

Since its emergence, SARS-CoV-2 activity in the United States has generally followed a seasonal pattern, characterized by increased activity in late summer and early winter, although the timing and magnitude of peaks have varied across jurisdictions.[4] Data from the National Respiratory and Enteric Virus Surveillance System show that across the 2022–2023, 2023–2024, and 2024–2025 respiratory virus seasons, summer peaks were greater in magnitude than winter peaks.[4] Although a winter peak occurred in January 2026 at the national level, data for the late summer period are still being reported, limiting the ability to assess whether this seasonal pattern has been maintained for the 2025–2026 season.[4]

Centers for Disease Control and Prevention (CDC) genomic surveillance indicates that the 2025–2026 season has been characterized by predominance of the JN.1 lineage, which accounted for over 95% of SARS-CoV-2 viruses circulating nationally as of mid-April 2026.[5] XFG, a descendant of the JN.1 lineage, remained the most prevalent variant during this period, accounting for more than 60% of SARS-CoV-2 viruses detected nationally, despite a recent decline in its relative proportion.[5] BA.3.2, the only variant exceeding 1% prevalence that is not descended from the JN.1 lineage, accounted for approximately 4% of circulating SARS-CoV-2 viruses in the United States as of mid-April 2026.[5]

These findings regarding SARS-CoV-2 activity should be interpreted in the context of several important limitations in surveillance. In the United States and globally, reductions in SARS-CoV-2 testing, driven in part by hospitals changing from universal admission testing to symptom-based testing, higher thresholds for testing among clinicians, and changes in patient health care-seeking behavior, along with the use of home-based tests, variability and lack of uniformity in state-level reporting, and the transition from comprehensive case-based reporting to sentinel surveillance systems, have resulted in increasing gaps in epidemiologic data. As a result, surveillance data may provide an incomplete picture of actual activity levels. Lower testing volume is also associated with less sequencing data, further limiting the ability to characterize current activity and predict future trends. In this context, morbidity and mortality data may provide a more reliable assessment of current activity.

## COVID-19 MORBIDITY AND MORTALITY IN CHILDREN

Although the national public health emergency has ended, COVID-19 continues to represent an ongoing public health concern. COVID-19 imposes a substantial disease burden, contributing to illness, hospitalization, and death across the US population. From October 1, 2025, through July 4, 2026, the CDC estimates 4.1 to 12.7 million illnesses, 860,000 to 2.3 million outpatient visits, 130,000 to 250,000 hospitalizations, and 14,000 to 42,000 deaths associated with COVID-19 in the United States.[6]

Following exposure to SARS-CoV-2, individuals may develop COVID-19, which can range in clinical severity from asymptomatic infection to life-threatening illness.[7] Among those with symptomatic infection, the severity may vary.[7] The most common symptoms are fever, chills, and sore throat for the currently circulating SARS-CoV-2 variants.[8] Although most individuals experience asymptomatic, mild, or moderate illness, SARS-CoV-2 infection and associated complications can progress to severe disease requiring hospitalization and, in the most severe cases, result in death.[7]

In addition to acute illness, some individuals develop postacute sequelae of SARS-CoV-2 (long COVID), characterized by persistent or recurring symptoms, such as fatigue, postexertional malaise, shortness of breath, persistent dry cough, cognitive difficulties ("brain fog"), headaches, gastrointestinal complaints, fevers, or sleep disturbances.[9,10] Postacute sequelae symptoms may vary depending on age and can occur following mild infection.[9,10] In a recent large longitudinal cohort study, children 0 through 5 years of age were more likely to experience fever and persistent dry cough, whereas older children were more likely to experience 1 or more multisystem symptoms.[10]

On the basis of data from the COVID-19 Hospitalization Surveillance Network (COVID-NET), COVID-19-associated hospitalization rates among children 0 through 17 years of age have followed a seasonal pattern, peaking in the summer and winter in alignment with trends in SARS-CoV-2 activity.[4,11] As of July 2026, the highest weekly hospitalization rate observed during the 2025–2026 season was 0.5 hospitalizations per 100,000 children.[11] In comparison, peak winter and summer weekly hospitalization

rates reached 0.9 and 0.8 hospitalizations per 100,000 population, respectively, during the 2024–2025 season.[11] Corresponding peaks during the 2023–2024 season were 1.7 and 1.1 hospitalizations per 100,000 population.[11] These findings demonstrate a continued decline in peak weekly hospitalization rates in recent years.

Despite declines in peak COVID-19-associated weekly hospitalization rates, substantial age-related differences persist, with infants and young children experiencing the highest burden. Hospitalization rates among infants younger than 12 months have been consistently higher than those observed among older children across seasons.[11] As of July 2026, the highest weekly hospitalization rate among infants during the 2025–2026 season was 4.7 hospitalizations per 100,000 population, nearly 10-fold higher than the peak rate observed among children overall.[11] Rather than exhibiting a single, distinct winter peak, weekly hospitalization rates among infants remained elevated throughout much of December 2025 through February 2026 and were characterized by multiple periods of increased activity.[11] Similarly, young children 12 through 23 months of age experienced persistently elevated hospitalization rates relative to older children, with peak weekly hospitalization rates ranging from 1.6 to 2.1 hospitalizations per 100,000 population during January through March 2026.[11]

Following declines in weekly hospitalization rates, COVID-19–associated cumulative hospitalization rates, which are calculated as the sum of weekly hospitalization rates over the respiratory season, have declined each respiratory season since the 2021–2022 season.[11] As of July 2026, the cumulative hospitalization rate among children 0 through 17 years of age during the 2025–2026 season to date was 9.6 hospitalizations per 100,000 population and was lower than rates observed during the same period in recent years (see Figure 1); however, this rate does not yet include potential increases during a summer peak.[11] By comparison, cumulative hospitalization rates for the complete respiratory season were 22.9, 42.6, 47.4, and 107.4 per 100,000 population during the 2024–2025, 2023–2024, 2022–2023, and 2021–2022 seasons, respectively.[11]

During the 2024-2025 season, COVID-19-associated cumulative hospitalization rates among children were highest among the youngest age groups. The highest cumulative hospitalization rate occurred in infants younger than 6 months of age (251.4 per 100,000 population), followed by infants 6 through 11 months of age (130.0 per 100,000) and young children 12 through 23 months of age (69.8 per 100,000).[11] Rates declined substantially thereafter, reaching 20.1 hospitalizations per 100,000 among young children 2 through 4 years of age and remaining below 10 per 100,000 among children and adolescents 5 through 17 years of age.[11] Similar age-related patterns have been observed in prior respiratory seasons, with infants and children younger than 2 years consistently experiencing substantially higher cumulative hospitalization rates than older children and adolescents.[11]

Notably, cumulative hospitalization rates among infants were higher than those observed among adults 50 through 64 years of age and 65 through 74 years of age (see Figure 2).[11] During the 2024–2025 season, the cumulative hospitalization rate among infants younger than 6 months (251.4 per 100,000 population) exceeded that of adults 65 through 74 years of age (209.9 per 100,000), and the rate among infants 6 through 11 months of age (130.0 per 100,000) exceeded that of adults 50 through 64 years of age (80.8 per 100,000).[11] Although adults ≥75 years of age experienced the highest rate of hospitalization (708.5 per 100,000), hospitalization rates across all ages were highest among both extremes of ages, demonstrating a pronounced age-related distribution.[11]

In addition to exceeding rates observed among some older adult age groups, COVID-19–associated cumulative hospitalization rates among infants 0 through 11 months of age were also higher than those for influenza during the 2024–2025 season (see Figure 3).[11,12] Among infants, cumulative COVID-19–associated hospitalization rates were 190.7 per 100,000 population compared with 154.3 per 100,000 for influenza-associated hospitalizations.[11,12] In contrast, COVID-19–associated cumulative hospitalization rates during the same season were substantially lower than influenza-associated rates for children and adolescents 1 through 17 years of age.[11,12] These data demonstrate that, despite overall

declines in pediatric COVID-19 morbidity, infants and young children continue to experience a substantial burden of severe disease.

Among children hospitalized for COVID-19 in 2022–2024, vaccination coverage was low. According to COVID-NET data, fewer than 4% of vaccine-eligible children were up to date with all recommended COVID-19 vaccine doses. Of those who were not up to date, most (85.9%; 95% confidence interval [CI], 84.2–87.4) had not received a COVID-19 vaccine dose in the year prior to SARS-CoV-2 infection.[13]

In alignment with trends observed in hospitalization rates, pediatric deaths in which COVID-19 was the underlying or a contributing cause have decreased every respiratory season among children 0 through 17 years of age but remain disproportionately concentrated among children 0 through 4 years of age.[14] From October 1, 2025, through June 25, 2026, a total of 58 pediatric deaths have been reported, although this figure does not include data from summer 2026.[14] Total pediatric deaths in the 2024–2025 season reached 148, corresponding to approximately 2.0 deaths per million children 0 through 17 years of age, a decrease from 265 total deaths in 2023–2024, 325 deaths in 2022–2023, and 891 deaths in 2021–2022.[14,15]

Although COVID-19–associated hospitalization and mortality rates have declined during the 2025–2026 season to date, current surveillance data do not yet capture potential increases during the summer months, when SARS-CoV-2 activity has historically peaked. In addition, the predominance of descendants of the JN.1 lineage, which emerged in late 2023, suggests that population immunity may be contributing to lower rates of hospitalization and death.[16] Whether these declining trends will persist in the setting of substantial viral evolution or strain replacement remains uncertain.

## HIGH-RISK GROUPS IN PEDIATRICS

Certain pediatric populations experience a disproportionate burden of COVID-19–associated severe outcomes. Infants younger than 6 months of age experience the highest rates of COVID-19–associated hospitalization among pediatric age groups; however, because COVID-19 vaccines are not authorized for this age group, considerations regarding maternal vaccination and protection of young infants through vaccination of household contacts are addressed in guidance from the American College of Obstetricians and Gynecologists at https://www.acog.org/clinical/clinical-guidance/practice-advisory/articles/2020/12/covid-19-vaccination-considerations-for-obstetric-gynecologic-care.[11]

In alignment with AAP recommendations, high-risk groups recommended to receive COVID-19 vaccination include all infants and children 6 through 23 months of age, children 6 months through 18 years of age who are moderately or severely immunocompromised, and children and adolescents 2 through 18 years of age in certain additional risk groups.[1,13,17,18,19,20,21,22] Examples of populations for whom COVID-19 vaccination is recommended are summarized in Table 1. COVID-19 vaccination is recommended for these groups because of their increased risk of severe disease, increased likelihood of exposure, absence of vaccine-derived immunity, and potential for indirect protection of vulnerable household contacts.

Children who are moderately or severely immunocompromised may require additional vaccine doses to optimize protection.[17,23,24] For individuals who meet criteria for more than 1 high-risk group, recommendations for persons who are moderately or severely immunocompromised supersede other population-specific recommendations.

In addition to populations at increased medical risk, disparities in COVID-19 burden have been observed among children from historically marginalized and vulnerable communities. These disparities warrant consideration in COVID-19 vaccination efforts.

**Infants and Children 6 Through 23 Months of Age**

Infants and young children 6 through 23 months of age experience a disproportionate COVID-19 burden compared with older pediatric age groups. This burden is characterized by substantially higher hospitalization rates than those observed among older children, a high proportion of infants and young children hospitalized for COVID-19 without underlying medical conditions, and COVID-19-associated deaths that remain concentrated among the youngest pediatric age groups.[11,13,14]

During the post-Omicron period, analyses of COVID-NET data from October 2022 through April 2024 showed that children 6 through 23 months of age accounted for approximately 45% of COVID-19 hospitalizations among vaccine-eligible children and adolescents.[13] Nearly 40% experienced severe COVID-19 and approximately 25% required intensive care, even as overall pediatric morbidity and mortality declined during this period.[11,13,14] Notably, only 41.8% (95% CI, 38.7–45.0) of children 6 through 23 months of age hospitalized for COVID-19 had 1 or more underlying medical conditions, indicating that severe disease occurred in otherwise healthy young children.[13] COVID-19–associated deaths also remain concentrated among the youngest children (see Figure 4). During the 2024–2025 season, 112 (75.7%) of the 148 total COVID-19–associated deaths among children occurred among infants and young children 0 through 4 years of age.[14]

The concentration of COVID-19–associated hospitalizations and deaths among infants and young children demonstrates the substantial burden of severe COVID-19 in this pediatric population, supporting the recommendation for COVID-19 vaccination for infants and young children 6 through 23 months of age without contraindications.

**Children 6 Months Through 18 Years Who Are Moderately or Severely Immunocompromised**

Children and adolescents 6 months through 18 years of age who are moderately or severely immunocompromised represent a high-risk pediatric population because of both an increased risk of severe COVID-19 and the potential for disruption of treatment for underlying medical conditions. As defined by the CDC, moderate or severe immunocompromise encompasses a range of conditions and

treatments, summarized in Box 1.[25] Because children who are moderately or severely immunocompromised may require additional COVID-19 vaccine doses and specific timing considerations to enhance protection against severe disease, recommendations for this population take precedence over recommendations based on age or membership in other high-risk groups.[17,23] Guidance on COVID-19 vaccination in immunocompromised individuals is available through the Infectious Diseases Society of America at https://www.idsociety.org/practice-guideline/Seasonal-RTI-Vaccinations-in-Immunocompromised-Patients/.[17]

Most immunocompromised children and adolescents are capable of mounting immune responses to COVID-19 vaccination, although the magnitude of response varies by underlying condition and treatment.[24] In a prospective study of 125 children and adolescents receiving biologic response modifiers, post solid organ transplantation, or receiving cancer chemotherapy, antibody and T-lymphocyte responses after a third COVID-19 vaccine dose were close to levels reported in healthy children, whereas responses were lower among children receiving chemotherapy.[26] Similarly, among individuals with sickle cell disease, COVID-19 vaccination was associated with seroconversion in all previously seronegative participants, and vaccine reactogenicity was comparable to that observed in the general population.[27]

However, vaccine immunogenicity may vary according to the specific immunosuppressive therapies received. In a smaller observational study of patients with neuroinflammatory conditions on immunosuppressive therapy, vaccine responses varied by immunosuppressive therapy, with substantially reduced responses among those receiving B-cell–depleting agents (rituximab) and more modest reductions among those receiving mycophenolate mofetil.[28] Despite variability in immune responses across conditions and therapies, these data support COVID-19 vaccination in children who are moderately or severely immunocompromised and provide a rationale for additional vaccine doses to optimize protection in this population.[24]

Evidence indicates that children who are immunocompromised are at increased risk for severe COVID-19 compared with children who are immunocompetent. A systematic review and meta-analysis extracting data from 24 studies published through August 2023 on individuals ≤21 years of age who were

immunocompromised found that this population had more than twice the odds of developing critical COVID-19, defined as intensive care unit (ICU) admission, invasive mechanical ventilation, or death, compared with individuals without immunocompromising conditions (odds ratio, 2.15; 95% CI, 1.58–2.91).[29] Earlier reviews similarly identified immunocompromise as a risk factor for severe COVID-19 and demonstrated higher rates of hospitalization, ICU admission, mechanical ventilation, and mortality among children and young people who are immunocompromised.[30,31]

These findings are supported by studies of critically ill and transplant recipient populations. Among patients <21 years of age admitted to an ICU between March 2020 and December 2021 for COVID-19, prior existence of an immunocompromising condition was associated with worse outcomes compared with those without immunocompromising conditions.[32] Similarly, in a 2013–2023 study of allogeneic hematopoietic cell transplant recipients 16 years and older with community-acquired respiratory virus infections, SARS-CoV-2 infection was identified as a risk factor for progression to lower respiratory tract disease (odds ratio, 7.33; $P<.001$).[33] Rates of progression from SARS-CoV-2 infection to lower respiratory tract disease were substantially higher during the pre-Omicron period, occurring in 45% of pre-Omicron infections compared with 6% after mass vaccination during the Omicron period.[33]

Beyond the increased risk of severe COVID-19 outcomes, SARS-CoV-2 infection has been associated with clinically significant complications in children who are immunocompromised, including treatment interruptions and organ-specific morbidity. In one study of children receiving treatment for acute lymphoblastic leukemia or lymphoma between March 2020 and June 2022, 87% experienced interruptions in chemotherapy following SARS-CoV-2 infection.[34] A separate registry study conducted from 2020 to 2022 among children and young adults found that 10% of kidney transplant participants developed acute kidney injury following COVID-19; among those with moderate to severe COVID-19, acute kidney injury occurred in more than 40%, and acute dialysis was required in approximately one-third of patients.[35]

On the basis of increased risk of severe disease and COVID-19–associated complications that may disrupt treatment of underlying conditions, COVID-19 vaccination is recommended for children 6

months through 18 years of age who are moderately or severely immunocompromised. Because these children may require additional vaccine doses to optimize protection, recommendations for individuals who are moderately or severely immunocompromised supersede recommendations based on age or membership in other risk groups.

**Children and Adolescents 2 Through 18 Years of Age in Certain Additional Risk Groups**

Children and adolescents 2 through 18 years of age in certain additional risk groups are recommended to receive a single dose of age-appropriate COVID-19 vaccine. These groups include children at high risk of severe COVID-19 because of underlying medical conditions, residents of long-term care facilities or other congregate settings, children who have never been vaccinated against COVID-19, and children whose household contacts are at high risk of severe COVID-19.

*Persons at High Risk of Severe COVID-19*

Children and adolescents 2 through 18 years of age with certain underlying medical conditions are considered a high-risk pediatric population. Examples of medical conditions for which COVID-19 vaccination is recommended are included in Table 1. COVID-NET data from October 2022 through April 2024 indicate that underlying medical conditions are common among children hospitalized for COVID-19; during this period, approximately 73% of children 2 through 17 years of age hospitalized for COVID-19 had at least 1 underlying medical condition.[13]

Specific underlying medical conditions were associated with an increased risk of severe COVID-19 among hospitalized children. Among children 2 through 17 years of age, chronic lung disease excluding asthma (adjusted risk ratio [aRR], 1.9; 95% CI, 1.5–2.3), diabetes mellitus (aRR, 1.5; 95% CI, 1.2–1.8), and neurologic disorders (aRR, 1.4; 95% CI, 1.2–1.6) were associated with severe COVID-19.[13] These findings support recommendations for COVID-19 vaccination among children and adolescents with underlying medical conditions.

*Residents of Long-Term Care Facilities or Other Congregate Settings*

Children and adolescents residing in long-term care facilities or other congregate settings may be at increased risk of COVID-19 because of both increased exposure risk and the higher prevalence of underlying medical conditions among residents. Long-term care and other congregate settings can facilitate SARS-CoV-2 transmission through shared living spaces and contact with caregivers. Further, pediatric long-term care facilities serve children and adolescents with medical complexity and underlying medical conditions.[36] The CDC notes that residents of long-term care facilities and other congregate settings may be at increased risk of SARS-CoV-2 infection.[18] The combination of increased opportunities for SARS-CoV-2 exposure and higher prevalence of conditions associated with severe COVID-19 among residents supports recommendations for COVID-19 vaccination among children and adolescents residing in long-term care facilities and other congregate settings.

*Persons Who Have Never Been Vaccinated Against COVID-19*

Children and adolescents who have never received a COVID-19 vaccine may be at increased risk for COVID-19 because they lack vaccine-derived protection. Evidence from postauthorization studies demonstrates that COVID-19 vaccination reduces the risk of SARS-CoV-2 infection, postacute sequelae of SARS-CoV-2 (long COVID), COVID-19–associated emergency department (ED) and urgent care (UC) encounters, hospitalization, critical illness, and death among pediatric populations.[19,37,38,39,40] Children and adolescents who have never been vaccinated have not received this additional protection against these outcomes. Accordingly, a single dose of age-appropriate COVID-19 vaccine is recommended for previously unvaccinated children and adolescents 2 through 18 years of age. Additional discussion of VE is provided in the Vaccine Effectiveness section.

*Persons Whose Household Contacts Are at High Risk for Severe COVID-19*

Children and adolescents living with pediatric or adult household members at high risk for severe COVID-19 may derive indirect benefits from COVID-19 vaccination. Adult household contacts at

increased risk include those ≥65 years of age, individuals who are immunocompromised, and individuals with underlying medical conditions associated with severe COVID-19 outcomes, such as diabetes mellitus and chronic pulmonary, liver, kidney, neurologic, and cardiac diseases.[20] For adult populations, the American Academy of Family Physicians provides recommendations for the use of COVID-19 vaccines at https://www.aafp.org/clinical-insights/immunizations-and-vaccines/respiratory-virus-vaccines. Because vaccination may help reduce household transmission and protect vulnerable household contacts, a single dose of age-appropriate COVID-19 vaccine is recommended for children and adolescents 2 through 18 years of age whose household contacts are at high risk for severe disease.[21,22] Evidence regarding the effect of COVID-19 vaccination on SARS-CoV-2 transmission is summarized in the Vaccine Effectiveness section.

**Children From Historically Marginalized and Vulnerable Communities**

Children from historically marginalized and vulnerable communities have experienced a disproportionate COVID-19 burden. In population-based surveillance, non-Hispanic Black and Hispanic children were hospitalized and admitted to intensive care at roughly twice the rate of non-Hispanic Asian or Pacific Islander children, and these disparities, although narrowing over time, persisted across successive surveillance periods and did not disappear.[41]

This excess burden reflects structural inequities and social drivers of health, including higher exposure risk (parents who are essential workers, crowded and multigenerational housing, reliance on public transportation), a higher prevalence of high-risk underlying conditions, and barriers to health care access; observed infection disparities attenuate slightly after adjustment for socioeconomic status.[42,43] Vaccination gaps compound these risks and are driven substantially by system-level access barriers such as longer travel times to pediatric vaccination sites and lower uptake in high–social-vulnerability and rural counties, rather than by vaccine hesitancy alone; national survey data show parental openness to vaccination was as high or higher among Hispanic, Black, and Asian parents than among white parents, underscoring that access and a clear provider recommendation are pivotal.[44,45,46]

Therefore, it is important for vaccine policies to explicitly promote equitable access, culturally and linguistically responsive communication, and targeted outreach to underserved populations. This guidance should be applied with the recognition that disparities are dynamic and that lower uptake reflects modifiable structural barriers as much as differences in vaccine confidence.[44,47]

## COVID-19 VACCINE PRODUCTS FOR PEDIATRICS

### Available Vaccines

COVID-19 vaccines are available for infants and children 6 months and older.[48] Vaccine options vary by age, and children may receive any age-appropriate, current formulation COVID-19 vaccine.[48] The COVID-19 vaccines licensed for use in the United States for the 2026–2027 season are described in Table 2. Refer to the current US Food and Drug Administration (FDA)-approved prescribing information (package insert) for the most up-to-date vaccine information on indications, formulations, presentations, and dosing.

In total, 4 COVID-19 vaccines are available: 3 messenger RNA (mRNA) vaccines and 1 adjuvanted protein vaccine. Of the 3 mRNA vaccines, Spikevax (mRNA-1273) and mNEXSPIKE (mRNA-1283) are manufactured by Moderna, and Comirnaty (BNT162b2) is manufactured by Pfizer-BioNTech.[49,50,51] The adjuvanted protein vaccine, Nuvaxovid (NVX-CoV2373), originally developed by Novavax, is manufactured by Sanofi.[52]

Spikevax is available for use in infants and children 6 months and older and is currently the only COVID-19 vaccine available for infants and children 6 months through 4 years of age in the United States.[49] For children 5 through 11 years of age, Comirnaty is an option in addition to Spikevax.[51] Individuals 12 years and older can receive Spikevax, mNEXSPIKE, Comirnaty, or Nuvaxovid.[49,50,51,52]

**2026–2027 Formulations**

Licensed COVID-19 vaccines differ in dose volume and antigen content by product and age group. Refer to the FDA for updated information on approved vaccines and formulations.

Spikevax is administered as a 0.25-mL dose for infants and children 6 months through 11 years of age and as a 0.5-mL dose for individuals 12 years and older; both formulations are supplied in single-dose prefilled syringes.[49] The 0.25-mL and 0.5 mL doses of Spikevax contain 25 mcg and 50 mcg, respectively, of nucleoside-modified mRNA (modRNA).[49] mNEXSPIKE is administered as a 0.2-mL dose containing 10 mcg of modRNA and is supplied in single-dose prefilled syringes.[50]

Like Spikevax, Comirnaty presentations differ for children 5 through 11 years of age compared with individuals 12 years and older.[51] For children 5 through 11 years of age, Comirnaty is administered as a 0.3-mL dose containing 10 mcg of modRNA encoding the viral spike (S) glycoprotein of SARS-CoV-2 and is supplied in single-dose vials.[51] For individuals 12 years and older, Comirnaty is administered as a 0.3-mL dose containing 30 mcg of modRNA encoding the viral spike (S) glycoprotein of SARS-CoV-2 and is supplied in single-dose prefilled syringes.[51]

As the only adjuvanted protein COVID-19 vaccine, Nuvaxovid contains 5 mcg of recombinant spike protein and 50 mcg of Matrix-M adjuvant per 0.5-mL dose.[52] Nuvaxovid is supplied in single-dose prefilled syringes.[52]

Although product formulations vary, all 2026-2027 COVID-19 vaccines licensed for use in the United States are monovalent and contain the XFG antigen, as recommended by the FDA.[53] The World Health Organization Technical Advisory Group on COVID-19 Vaccine Composition recommended monovalent LP.8.1 as the preferred antigen but stated that other antigens such as XFG or NB.1.8.1 could be used alternatively.[54] The FDA selected the XFG antigen for the 2026–2027 COVID-19 vaccine formulation after reviewing available data on circulating SARS-CoV-2 variants, VE, antigenic

characterization, and immunogenicity, with the goal of more closely matching currently circulating SARS-CoV-2 viruses.[53]

**Vaccine Storage and Handling**

COVID-19 vaccines have product-specific storage specifications. Refer to the most recent FDA-approved prescribing information (package insert) for the most up-to-date storage and handling instructions. Storage and handling specifications for COVID-19 vaccines licensed for use in the United States are summarized in Table 3.

Spikevax, mNEXSPIKE, and single-dose vials of Comirnaty may be stored frozen or refrigerated, with Comirnaty requiring an ultra-low-temperature freezer if stored frozen.[49,50,51] In contrast, Nuvaxovid and prefilled syringes of Comirnaty are intended for refrigerated storage only.[51,52] The allowed duration of refrigerated storage at 2°C to 8°C (36°F to 46°F) varies by vaccine product.[49,50,51,52] Room temperature storage specifications vary by product, and appropriate protection from light is required.[49,50,51,52] For vaccine products that may be stored frozen (Spikevax, mNEXSPIKE, Comirnaty single-dose vials), refreezing is not permitted once the product has been thawed.[49,50,51]

Guidance on vaccine storage and handling is available through the AAP at https://www.aap.org/en/patient care/immunizations/implementing-immunization-administration-in-your-practice/vaccine-storage-and-handling/. In addition, the AAP Pediatric Preparedness Resource Kit covers vaccine management strategies to maintain proper storage temperatures during a power failure or other disaster (https://www.aap.org/en/patient-care/disasters-and-children/professional-resources-for-disaster-preparedness/pediatric-preparedness-resource-kit/).

**Vaccine Administration**

AAP recommendations for the use of COVID-19 vaccines for infants, children, and adolescents for the 2026–2027 season are provided in the policy statement, "Recommendations for COVID-19 Vaccines in Infants, Children, and Adolescents."[1] Notably, AAP recommendations are broader than

indications that have received FDA approval. Although minimum authorized ages vary by product, the FDA has approved COVID-19 vaccines for use in individuals 6 months through 64 years of age who have at least 1 underlying condition associated with an increased risk for severe outcomes from COVID-19.[55,56,57,58]

COVID-19 vaccination schedules are product-specific and vary based on age, COVID-19 vaccination history (including receipt of prior formulations), and immunocompromised status.[48] Infants, children, and adolescents who are moderately or severely immunocompromised require additional doses as part of the primary vaccination series or following vaccination with prior formulations.[48] Detailed dosing schedules by age, product, vaccination history, and immunocompromised status are available in the AAP COVID Vaccine Dosing Quick Reference Guide (http://aap.org/CovidVaccineGuide).

All 2026-2027 COVID-19 vaccines are administered intramuscularly, with injection site determined by age and muscle mass.[49,50,51,52] For infants and children 6 months through 2 years of age, the anterolateral thigh is typically the preferred site for vaccine administration because of muscle mass.[59] For individuals 3 through 18 years of age, the preferred injection site is the deltoid muscle, although vaccines can also be administered via the anterolateral thigh.[59]

## EFFECTIVENESS OF COVID-19 IMMUNIZATION

Evidence indicates that COVID-19 immunization provides meaningful protection against a range of COVID-19-related outcomes in children and adolescents. Available studies, which have primarily evaluated mRNA COVID-19 vaccines, indicate that vaccination reduces the risk of SARS-CoV-2 infection and severe COVID-19 outcomes and may reduce secondary transmission.[19,22,38,39,40] Although recent pediatric data evaluating COVID-19 VE remain limited because of suboptimal uptake of updated COVID-19 vaccines among children and adolescents, the available recent studies have generally reported effectiveness estimates consistent with the broader literature on COVID-19 vaccine effectiveness.

**SARS-CoV-2 Infection and Illness**

Evidence from multiple studies indicates that COVID-19 vaccination provides meaningful protection against SARS-CoV-2 infection among children and adolescents. In a US prospective cohort study conducted from September 2022 through January 2023, when Omicron was the predominant variant, receipt of a bivalent mRNA COVID-19 vaccine dose was associated with a 54.0% (95% CI, 36.6%–69.1%) reduction in the risk of laboratory-confirmed infection and 49.4% (95% CI, 22.2%–70.7%) reduction in the risk of symptomatic infection among children and adolescents 5 through 17 years of age compared with those who were unvaccinated or who had only received monovalent COVID-19 vaccine doses.[60]

Multiple international studies have found that BNT162b2 provides protection against SARS-CoV-2 infection, although protection wanes over time. A Japanese case-control study of children 6 months through 11 years of age conducted during Omicron outbreaks from April 2023 through April 2024 found that VE against symptomatic infection declined over time.[61] Among children 6 months through 4 years of age, estimated VE exceeded 60% during the 6 months after the last vaccine dose but declined to 46% (95% CI, -24%–76%) at ≥6 months.[61] Among children 5 through 11 years of age, VE was approximately 60% during the 6 months after the last vaccine dose, with no statistically significant protection observed beyond 6 months.[61] Stratification by vaccination history indicated that statistically significant protection against symptomatic infection was confined to children without a history of COVID-19.[61] A Scottish study of children 5 through 11 years of age conducted from March 2022 through January 2023 reported VE against symptomatic COVID-19 of 60.8% (95% CI, 0.3%–84.5%) at 2 to 26 weeks after the first dose and 41.6% (95% CI, -89.6%–82.0%) at 2 to 26 weeks after the second dose; however, protection was no longer detectable beyond 26 weeks.[62]

An earlier study in England conducted during the COVID-19 vaccine rollout also found that BNT162b2 vaccination provided modest protection against a positive SARS-CoV-2 test result among adolescents 12 through 15 years of age.[19] VE against a positive SARS-CoV-2 test result was 26.30%

following the first dose compared with unvaccinated adolescents and 33.1% following the second dose, compared with adolescents who had received a single dose.[19] Protection waned over time, with cumulative incidence of positive SARS-CoV-2 test results becoming similar between comparison groups by approximately 14 to 15 weeks after vaccination.[19]

While conducted during a period spanning the transition from Delta to Omicron as the dominant variant, an observational study in Denmark among adolescents 12 through 15 years of age found that 2 doses of BNT162b2 provided protection against mild, moderate, and severe SARS-CoV-2 infection compared with remaining unvaccinated.[63] Protection against mild and moderate disease waned substantially over the study period, from VE of 42.88% (risk ratio [RR], 0.57) and 53.71% (RR, 0.46), respectively, within 25 days of full vaccination to 8.37% (RR, 0.92) and 22.73% (RR, 0.77) by day 320.[63] In contrast, VE against severe disease was estimated at 61.82% (RR, 0.38) within 25 days of full vaccination and 78.12% (RR, 0.22) at 320 days, suggesting that protection against severe disease may be more durable than protection against mild or moderate disease, although severe disease was rare.[63]

Among pediatric solid organ or hematopoietic cell transplant recipients ≤18 years of age, who represent a high-risk population, a single-center US observational case-control study conducted from March 2020 through January 2024 found that completion of a 3-dose mRNA COVID-19 primary series was associated with an adjusted VE of 52.6% (95% CI, 2.8%–76.9%) against SARS-CoV-2 infection.[64] No severe cases occurred among children and adolescents who had completed the primary series, whereas severe cases occurred among those who were unvaccinated at the time of infection.[64]

Collectively, these findings indicate that COVID-19 vaccination provides protection against SARS-CoV-2 infection among children and adolescents.

**Postacute Sequelae of SARS-CoV-2 (Long COVID)**

Across multiple studies, COVID-19 vaccination prior to SARS-CoV-2 infection has been associated with a reduced risk of postacute sequelae of SARS-CoV-2 (long COVID) following infection

in children and adolescents. In a US case-control study of children 5 through 17 years of age enrolled between July 2021 and September 2022 with follow-up through May 2023, mRNA COVID-19 vaccination prior to SARS-CoV-2 infection was associated with lower odds of long COVID symptoms.[37] Compared with unvaccinated children, vaccinated children had lower adjusted odds of reporting at least 1 persistent symptom (adjusted odds ratio, 0.43; 95% CI, 0.19–0.98) and at least 2 persistent symptoms (adjusted odds ratio, 0.27; 95% CI, 0.10–0.69).[37]

Evidence from 2 US retrospective cohort studies of children and adolescents similarly found that mRNA COVID-19 vaccination provided a protective effect against long COVID, although effectiveness was generally higher among adolescents and decreased with time since vaccination.[65,66] One of the studies, which evaluated VE over 18 months, observed substantial waning of protection, with VE of 61.4% (95% CI, 51.0%–69.6%) within 6 months after vaccination, decreasing to 35.4% (95% CI, 24.5%–44.7%) by 12 months and to 10.6% (95% CI, -26.8%–37.0%) at 18 months.[65] Overall, these findings indicate that COVID-19 vaccination provides meaningful but time-limited protection against long COVID following SARS-CoV-2 infection in pediatric populations.

**COVID-19-Associated Emergency Department or Urgent Care Encounters and Hospitalizations**

Across multiple study designs and settings, the available evidence indicates that COVID-19 vaccination is associated with lower rates of COVID-19-associated ED visits, UC encounters, and hospitalizations among children and adolescents. An analysis from the CDC-supported Virtual SARS-CoV-2, Influenza, and Other respiratory viruses Network (VISION) found that immunocompetent children and adolescents 9 months through 17 years of age who received a 2024–2025 COVID-19 vaccine were less likely to have a COVID-19–associated ED/UC encounter than those who had not received the vaccine.[67] Using a test-negative case-control design, the analysis estimated VE among children 9 months through 4 years of age to be 76% (95% CI, 58%–87%) within 7 to 179 days after vaccination and 77% (95% CI, 62%–86%) within 7 to 299 days after vaccination.[67] Corresponding estimates among children and adolescents 5 through 17 years of age were 56% (95% CI, 35%–70%) and

45% (95% CI, 25%–59%).[67] Earlier VISION analyses similarly found that updated COVID-19 vaccination provided protection against COVID-19-associated ED/UC encounters among immunocompetent children and adolescents.[68,69]

Consistent with the VISION findings, additional US-based analyses conducted during the 2023–2024 season provide further evidence that updated COVID-19 vaccination reduced COVID-19–associated ED/UC encounters among children and adolescents and was associated with a lower occurrence of hospitalization. A large retrospective cohort analysis of more than 2.4 million children and adolescents 5 through 17 years of age in California and Louisiana found that receipt of a 2023–2024 BNT162b2 vaccine was associated with an adjusted VE of 63% (95% CI, 39%–77%) against ED/UC encounters.[70] Findings were reinforced by a separate test-negative case-control analysis of children and adolescents 5 through 17 years of age conducted within a large health system in California during the same period, which likewise found that receipt of BNT162b2 was associated with reduced COVID-19-associated ED/UC encounters, with estimated VE similar in magnitude to that observed in the larger cohort analysis.[71] In both studies, no COVID-19–associated hospitalizations occurred among vaccinated children, limiting the ability to estimate hospitalization-specific VE.[70,71]

Earlier US studies conducted during Omicron predominance similarly demonstrated protection against hospitalization. In a test-negative case-control study conducted between December 2021 and February 2022, receipt of BNT162b2 was associated with VE of 68% (95% CI, 42%–82%) against COVID-19-associated hospitalization among children 5 through 11 years of age and 40% (95% CI, 9%–60%) among adolescents 12 through 18 years of age.[38] Similar findings were reported in other US studies conducted during Delta predominance, supporting the consistency of protection against hospitalization across successive phases of the pandemic.[39,72]

International studies provide complementary evidence that COVID-19 vaccination protects against severe outcomes. A large Brazilian population-based cohort study conducted between February 2020 and June 2025, which included 3.7 million individuals younger than 18 years, found that receipt of 3

or more COVID-19 vaccine doses was associated with VE of 55.9% (95% CI, 52.3%–59.3%) against hospitalization and 53.1% (95% CI, 46.3%–59.1%) against severe COVID-19.[40] Of note, the analysis included multiple vaccine platforms; however, BNT162b2 accounted for 66.7% of primary series vaccinations and 97.6% of booster doses, making the overall estimates largely reflective of mRNA COVID-19 vaccine performance.[40] Protection against hospitalization and severe COVID-19 was observed among children both with and without comorbidities.[40]

Additionally, a test-negative case-control study conducted in Hong Kong between April 2022 and February 2024 found that BNT162b2 vaccination was associated with VE against hospitalization of 87% (95% CI, 0–98%) among young children 1 through 4 years of age and 82% (95% CI, 59%–92%) among children and adolescents 5 through 17 years of age, although estimates were imprecise because of small numbers of outcome events.[73] International studies evaluating earlier phases of the pandemic similarly found that COVID-19 vaccination was associated with protection against COVID-19–associated hospitalization and severe outcomes, reinforcing the consistency of these findings across settings and time periods.[74,75]

Taken together, the available evidence indicates that COVID-19 vaccination provides protection against COVID-19-associated ED/UC encounters and hospitalizations among children and adolescents across diverse populations, settings, and time periods.

**COVID-19-Associated ICU Admission**

Evidence regarding ICU admission in pediatric populations is drawn largely from earlier studies, as these outcomes have been uncommon in more recent analyses, limiting the ability to precisely estimate VE. In the US-based test-negative, case-control study conducted during Omicron predominance from December 2021 to February 2022, receipt of BNT162b2 was associated with VE of 79% (95% CI, 51–91%) against critical COVID-19 among adolescents 12 through 18 years of age.[38] An earlier analysis from the same surveillance network conducted during Delta predominance from July through October

2021 reported very high effectiveness of BNT162b2 among adolescents 12 through 18 years of age against ICU admission and COVID-19 requiring life support, with VE estimates of 98% for both outcomes.[72]

Additional studies provide supportive evidence where critical outcomes were rare. In these analyses, COVID-19-associated ICU or critical care admissions occurred only among unvaccinated children and adolescents, but the number of events was too small to precisely estimate VE.[19,39] Although critical outcomes have been uncommon in recent studies, available evidence suggests that COVID-19 vaccination is protective against ICU admission and other critical care outcomes.

**COVID-19–Specific Mortality**

Evidence directly evaluating COVID-19 VE against death in children and adolescents is limited, because COVID-19–associated mortality is relatively low in pediatric populations, resulting in few outcome events. However, available evidence suggests that vaccination provides substantial protection against death, particularly among children with underlying medical conditions. In the large Brazilian population-based cohort study described previously, receipt of 3 or more COVID-19 vaccine doses was associated with protection against death.[40] Among recipients of BNT162b2, estimated VE against death was 72.1% (95% CI, 43.6%–86.2%) among children with comorbidities and 45.7% (95% CI, 20.0%–64.5%) among children without comorbidities.[40] Additionally, 99% of deaths occurred among children who had not received a COVID-19 booster dose.[40] Interpretation of these findings suggests that booster vaccination provides important protection against death, although differences in pediatric in-hospital mortality between Brazil and high-income countries may limit generalizability to the US setting.[40]

**Transmission**

Direct evidence evaluating COVID-19 VE against SARS-CoV-2 transmission among children and adolescents is sparse but suggests that vaccination reduces transmission. Most studies of transmission in pediatric settings, such as schools, child care centers, camps, and households, were conducted before

children were eligible for COVID-19 vaccination or during periods following initial vaccine rollout, when relatively few children were vaccinated.

A CDC investigation of a Delta variant outbreak at an overnight youth summer camp in Texas in June 2021 assessed SARS-CoV-2 transmission by vaccination status.[21] Of the 451 camp attendees, 364 (81%) were children and adolescents younger than 18 years.[21] At the time of the outbreak, 17% of youth attendees were fully or partially vaccinated, as eligibility had only recently expanded to adolescents.[21] The attack rate was 42% across youth attendees and was substantially lower among vaccinated than unvaccinated children and adolescents (13% vs 48%).[21] In analyses of household transmission, secondary attack rates were lower among contacts of vaccinated index cases than among contacts of unvaccinated index cases (17% vs 58%).[21] However, all secondary household cases associated with vaccinated index cases occurred in households that also included an unvaccinated index case, precluding definitive attribution of transmission to vaccinated individuals.[21] Although interpretation is limited by these circumstances, these findings suggest vaccination may reduce secondary household transmission.[21]

A more recent prospective household transmission study of children, adolescents, and adults conducted during 2024–2025, a period of higher SARS-CoV-2 population immunity, provides additional evidence on the effect of COVID-19 vaccination on transmission.[22] Within households, the risk of secondary infection was significantly lower when exposed to a primary case who had received a COVID-19 vaccine within 6 months before illness onset than when exposed to an unvaccinated primary case (adjusted relative risk, 0.57; 95% CI, 0.35%–0.93%).[22] No statistically significant reduction in infection risk was observed based on the vaccination status of household contacts themselves, suggesting that the primary protective effect observed was through reduced transmission from recently vaccinated index cases.[22] Together, these findings suggest that recent COVID-19 vaccination may confer indirect benefits by reducing secondary transmission in high-exposure settings.

## SAFETY OF COVID-19 VACCINES

COVID-19 vaccines have demonstrated a favorable safety profile in pediatric populations based on extensive postauthorization monitoring. Although postauthorization safety surveillance has identified myocarditis as an adverse event causally associated with mRNA COVID-19 vaccination among adolescents 12 years and older, the absolute risk is low, the observed risk early in the pandemic was lower than the risk associated with natural infection, and risk was concentrated primarily among males.[19,75,76,77,78] In contrast, postauthorization safety surveillance has not identified consistent evidence of increased risk for other serious adverse events in infants, children, and adolescents, including Guillain-Barré syndrome (GBS), immune thrombocytopenia, febrile seizures, life-threatening reactions, or death.[76,79,80,81,82,83,84] Available safety evidence is derived primarily from mRNA COVID-19 vaccines and largely reflects data generated during earlier periods when vaccine uptake and the burden of COVID-19-associated morbidity in pediatric populations were higher than currently observed. Because detection of rare adverse events depends on greater vaccine uptake, safety data are inherently more limited during periods with low vaccination coverage.

### Myocarditis

Postauthorization safety surveillance and observational studies have identified myocarditis as a rare adverse event causally associated with mRNA COVID-19 vaccination, with a consistent safety signal observed primarily among males 12 years and older within pediatric populations.[19,75,76,77,78,79] This association was first detected during the early postauthorization period in 2021 and was subsequently evaluated across multiple complementary vaccine safety surveillance systems, including passive surveillance (Vaccine Adverse Event Reporting System), active surveillance using electronic health records (Vaccine Safety Datalink [VSD]), v-safe (a voluntary smartphone-based active monitoring system), and population-based cohort studies conducted in the United States and internationally.[76,80,85,86,87]

Myocarditis risk following mRNA COVID-19 vaccination among adolescent males has been shown to be highest after the second dose of the primary series, with lower risks observed after the first dose and booster doses.[76,86,87,88] During the early postauthorization period, US vaccine safety surveillance data estimated myocarditis rates among adolescent males following a second dose of mRNA COVID-19 vaccines to range from approximately 50 to 110 cases per million doses, depending on age group and surveillance source.[85,86,87]

International findings have been consistent with US data. Population-based studies from multiple countries have reported increased relative risks of myocarditis following mRNA COVID-19 vaccination, with the greatest risk observed among adolescent males and after the second dose, while also demonstrating that absolute risk remained low.[76,77,81,89] Although mRNA COVID-19 vaccination has been associated with an increased risk of myocarditis/pericarditis, a large population-based study from England reported that the risk of myocarditis/pericarditis following SARS-CoV-2 infection was substantially higher than the risk observed following BNT162b2 vaccination among children and adolescents; however, it should be noted that this study captured data through 2022, a period dominated by earlier SARS-CoV-2 variants and the primary mRNA vaccination series, which carried the highest risk of myocarditis, and that the absolute risks of both infection- and vaccine-associated myocarditis have likely decreased.[77] Reasons for the decrease include the attenuation of viral severity with subsequent variants, widespread population immunity, updated vaccine formulations and longer interdose intervals, and the generally mild and self-limited clinical course observed with vaccine-associated myocarditis in this age group.[77] Myocarditis risk comparisons between the United States and other countries are limited, because contemporary epidemiologic data demonstrate that myocarditis has a markedly heterogenous distribution across geographic regions and demographic groups, with substantial variation by age, sex, and ancestry, reflecting regional, genetic, environmental, and socioeconomic factors.[90]

Across settings, the myocarditis signal has been strongly age- and sex-specific, with substantially higher rates observed in males 12 years and older than among females or younger pediatric age

groups.[81,85,86,87] In contrast with findings among adolescents, no consistent myocarditis safety signal has been identified in younger pediatric populations.[19,75,82,91] Reported cases among younger children have been rare, with some analyses reporting no confirmed cases among children younger than 5 years.[78,80,82]

Much of the evidence informing risk characterization was generated during the early postauthorization period, when SARS-CoV-2 circulation and the burden of COVID-19-associated morbidity were higher than are currently observed in pediatric populations.[85,86,87] Recent epidemiologic data suggest that the overall incidence of vaccine-associated myocarditis has declined significantly compared with that observed during the early postauthorization period with original monovalent mRNA vaccines.[92,93] A large pharmacovigilance study reported lower myocarditis/pericarditis rates following bivalent preparations of vaccine compared with earlier monovalent preparations (1.24 vs 6.91 cases per million doses administered, respectively).[93]

Previous reports of COVID-19 vaccine-associated myocarditis in adolescents has generally been characterized by milder clinical presentations, less need for intensive care and respiratory support, shorter hospital stays, infrequent clinically significant arrhythmias, and favorable short-term outcomes.[76,78,94] Follow-up assessments have indicated that most children and adolescents who experienced myocarditis following COVID-19 vaccination have fully or probably fully recovered.[94] Although the epidemiologic context has since evolved, these earlier comparisons remain informative for understanding both the relative magnitude and clinical severity of vaccine-associated myocarditis as it was originally identified.

In summary, mRNA COVID-19 vaccination has been associated with a rare risk of myocarditis, concentrated primarily among adolescent males and occurring most frequently following the second dose of the primary series, while more recent evidence suggests lower rates with newer formulations.

**Guillain-Barré Syndrome**

Evidence from vaccine safety surveillance systems and epidemiologic studies has not demonstrated an increased risk of GBS following mRNA COVID-19 vaccination in pediatric

populations.[76,80,81] Across multiple CDC postauthorization surveillance systems, reports of GBS after mRNA COVID-19 vaccination have been rare, and no safety signal has been identified among children or adolescents.[82,87,91] In addition, evidence from large self-controlled case series, cohort studies, and other observational studies conducted in the United States and internationally has not demonstrated an increased risk of GBS following mRNA COVID-19 vaccination in children and adolescents.[76,81,95] Although precise estimation of risk is limited by the rarity of GBS in pediatric populations, these data do not support a GBS safety signal associated with mRNA COVID-19 vaccination in pediatric populations.

**Immune Thrombocytopenia and Related Hematologic Events**

Data from surveillance systems and epidemiologic studies do not support an association between mRNA COVID-19 vaccination and immune thrombocytopenia (ITP), previously called immune thrombocytopenic purpura or idiopathic thrombocytopenic purpura, or related hematologic events in pediatric populations.[76,81,91,95] Review of US postauthorization vaccine safety data, including CDC analyses using VAERS, VSD, and v-safe, indicates that reports of ITP following vaccination have been rare and that no ITP safety signal has been identified in children and adolescents.[82,87,91] Consistent with these findings, epidemiologic studies in the United States and multiple other countries have not identified an increased risk of ITP following mRNA COVID-19 vaccination in children and adolescents.[76,81,95]

A self-controlled case series study in England that included more than 5.1 million children and adolescents 5 through 17 years of age and evaluated COVID-19 vaccines administered between December 2020 and August 2022 did not observe an increased risk of hospitalization with ITP in the 1 to 42 days following any dose BNT162b2 vaccination.[81] Similarly, no increased risk of ITP following SARS-CoV-2 infection was observed among children and adolescents who had received at least 1 dose of COVID-19 vaccine before infection.[81] No increased risk was observed following mRNA-1273 vaccination; however, statistical power was limited, as fewer than 0.1% of vaccinated children 5 through 11 years of age and adolescents 12 through 17 years of age received a dose of mRNA-1273.[81]

In contrast, the same study observed an increased risk of hospitalization with ITP in the 1 to 42 days following SARS-CoV-2 infection among adolescents 12 through 17 years of age who had not been vaccinated prior to infection (incidence rate ratio, 1.79; 95% CI, 1.26–2.54; excess events per million, 15; 95% CI, 7–21).[81] In sex-stratified analyses, the increased risk was restricted to females 12 through 17 years of age.[81] Increased risks were also observed among both males and females 5 through 11 years of age who had not been vaccinated prior to infection.[81]

Whereas SARS-CoV-2 infection in unvaccinated pediatric populations has been associated with an increased risk of ITP, no such association has been observed following mRNA COVID-19 vaccination in children and adolescents.[81] In addition to ITP, reports of related hematologic conditions, including thrombosis with thrombocytopenia syndrome and thrombotic thrombocytopenic purpura, have been rare in postauthorization surveillance, and no safety signals have been identified among children or adolescents following mRNA COVID-19 vaccination.[87,91]

**Febrile Seizures**

Febrile seizures following COVID-19 vaccination in children have been rare. During CDC postauthorization monitoring, febrile seizures were reported infrequently following COVID-19 vaccination, with 1 case considered plausibly associated with vaccination among approximately 1 million mRNA COVID-19 vaccine doses administered to infants and young children 6 months through 5 years of age and 2 cases reported among approximately 8 million BNT162b2 doses administered to children 5 through 11 years of age.[96,97] Further CDC monitoring and active surveillance analyses, together with international studies, have not identified evidence of a febrile seizure safety signal following mRNA COVID-19 vaccination in children.[82,89,91,98,99,100,101]

Evidence suggesting a potential increased risk of seizures following mRNA COVID-19 vaccination in young children comes primarily from studies conducted under the FDA Biologics Effectiveness and Safety Initiative. Near real-time surveillance identified statistical signals for seizures

among young children 2 through 4 years of age following ancestral monovalent BNT162b2 vaccination and among young children 2 through 5 years of age following ancestral monovalent mRNA-1273 vaccination, with most identified cases classified as febrile seizures.[80] However, the findings were sensitive to the choice of background rates and were considered to require further evaluation.[80]

A subsequent self-controlled case series study among young children 2 through 5 years of age observed a slight elevation in febrile seizure risk shortly after mRNA-1273 vaccination, amounting to approximately 3 excess cases per 100,000 doses, while no statistically significant increase was observed following BNT162b2 vaccination.[83] Although isolated studies have reported increased rates of seizure-related outcomes in certain age groups following vaccination, these findings have not been consistently observed across surveillance systems or epidemiologic studies.[76,80,82,87,91,96,97,98] Collectively, the available evidence does not support a consistent febrile seizure safety signal following mRNA COVID-19 vaccination in children, and where a short-term increase has been observed, the absolute risk estimates have remained very low.

**Reactogenicity Limiting Activities of Daily Living**

Across studies, postvaccination reactogenicity in infants, children, and adolescents has generally been mild to moderate in severity, with symptoms most frequently reported the day after vaccination.[87,88,91,96,97,98,99,100,102] The most commonly reported symptoms among children and adolescents included injection site pain, fatigue, headache, myalgia, and fever, as well as irritability or crying among infants and young children 6 months through 2 years of age.[87,88,91,96,97,98,99,100,102] Roughly one quarter of adolescents 12 through 17 years of age reported being unable to perform normal daily activities after dose 2 or a booster dose, whereas rates among younger children were generally lower, ranging from approximately 3% to 8% after primary-series vaccination and up to 12% to 14% following some booster doses.[87,88,91,96,97,98,99,100,102] Despite these short-term impacts on daily functioning, medical care was infrequently sought, and hospitalization was rare.[87,88,91,96,97,98,99,100,102]

**Life-Threatening Reactions**

Life-threatening reactions following COVID-19 vaccination in children and adolescents have been rare.[82,87,91] Among potential life-threatening reactions following vaccination, anaphylaxis has been a particular focus of postauthorization safety surveillance. Anaphylaxis following COVID-19 vaccination has been reported infrequently across pediatric age groups. US surveillance systems identified fewer than 2 cases per million doses administered, whereas analyses of reports submitted to EudraVigilance, the European pharmacovigilance system, estimated reporting rates of approximately 13 cases per million doses administered.[87,91,103] Although a nationwide epidemiologic study from Norway identified increased relative rates of anaphylactic reactions during postvaccination risk periods, these findings were based on very small numbers of events and were associated with substantial statistical uncertainty.[76] While isolated fatal cases have been reported in international passive surveillance systems, the overall body of evidence indicates that anaphylaxis remains a rare adverse event and does not support a consistent safety signal in children and adolescents.[87,91,103]

In addition to anaphylaxis, passive surveillance systems have received sporadic reports of other serious neurologic, vascular, and inflammatory events, including stroke, pulmonary embolism and other thromboembolic events, inflammatory neurologic disorders such as encephalitis and myelitis, and multisystem inflammatory syndrome in children.[82,87,88,91,96] These events were rare and have not demonstrated consistent temporal or clinical patterns suggestive of a vaccine-related syndrome.[82,87,88,91,96] Among reported multisystem inflammatory syndrome in children cases that underwent clinical review, most had evidence of prior SARS-CoV-2 infection.[87,91] Active surveillance studies have not identified safety signals for these outcomes, and an association with vaccination has not been established.

**Death**

Reported deaths following vaccination have been uncommon and have undergone review using available medical records, death certificates, and autopsy findings when available.[87,91,97] Among reviewed

cases, deaths were generally attributable to alternative causes or preexisting disease unrelated to vaccination.[87,91,97,102] In several cases, children had complex preexisting medical conditions or underlying risk factors predating COVID-19 vaccination.[87,97] Review of available medical records, death certificates, and autopsy findings has not identified patterns suggesting death is associated with COVID-19 vaccination.[87,91,97,102]

Findings from US safety monitoring are supported by evidence from large epidemiologic studies and international safety monitoring systems. Large VSD-based cohort studies and self-controlled case series analyses have consistently demonstrated no increased mortality risk following receipt of COVID-19 vaccines among individuals 12 years and older.[84,104] Similarly, international data, including a nationwide study from Norway and a national vaccine safety surveillance report from Australia, have not identified deaths in children or adolescents that were determined to be causally related to COVID-19 vaccination.[76,105] The available evidence from surveillance systems, case reviews, and large epidemiologic studies does not support an association between COVID-19 vaccination and death in children and adolescents.

**Other Serious Adverse Events**

Serious adverse events beyond those described above have been reported infrequently following COVID-19 vaccination in pediatric populations. Across postauthorization surveillance and epidemiologic studies, reports of serious adverse events have encompassed a wide range of clinical conditions, including appendicitis, Bell's palsy, Kawasaki disease, lymphadenopathy, nonanaphylactic allergic reactions, and tachycardia.[76,82,87,91] Although some studies have reported increased rates of selected outcomes during defined postvaccination risk periods, findings have generally been inconsistent across surveillance systems and epidemiologic studies, and no consistent association has been established for other serious adverse events among children and adolescents.[76,79,81]

## COST-EFFECTIVENESS

In its 2026 evidence report on COVID-19 vaccines, the Institute for Clinical and Economic Review, using estimates largely extrapolated from the 2024–2025 CDC VISION pediatric vaccine effectiveness study, estimated that approximately 1000 vaccinations would be needed to prevent 1 COVID-19-associated hospitalization among infants 6 to 12 months of age, 1900 vaccinations among children 1 to 2 years of age, 6600 vaccinations among children 2 to 5 years of age, and 20,000 vaccinations among children 5 to 18 years of age.[106] Because these estimates are influenced by the underlying risk of COVID-19-associated hospitalization, the number needed to vaccinate would be expected to be lower during periods when hospitalization rates are higher. Notably, the estimated number needed to vaccinate to prevent 1 hospitalization among infants 6 to 12 months of age (1000) was lower than the estimate for adults aged ≥65 years (1300), and the estimate for children 1 to 2 years of age (1900) was of a similar magnitude.[106] These findings suggest that the expected direct benefits of vaccination vary substantially across pediatric age groups.

## COADMINISTRATION OF COVID-19 VACCINE AND OTHER IMMUNIZATIONS

In general, COVID-19 vaccine can be administered concomitantly with other indicated immunizations in the absence of contraindications. Simultaneous administration with age-appropriate recommended immunizations is supported, including influenza vaccine and monoclonal antibody products used for the prevention of respiratory syncytial virus, such as nirsevimab or clesrovimab.[107,108] Evidence from a large observational study found no increased risk of selected adverse events of special interest among children when influenza and COVID-19 vaccines were administered concomitantly compared with administration of the COVID-19 vaccine alone.[109] Overall, coadministration is supported to facilitate timely and complete immunization in children.

Specific considerations apply to coadministration of COVID-19 vaccines and orthopoxvirus vaccines. Two orthopoxvirus vaccines, JYNNEOS and ACAM2000, have been available for mpox prevention, although JYNNEOS has been the primary orthopoxvirus vaccine used in the United States since the clade IIb mpox outbreak began in 2022.[110] Under Emergency Use Authorization, JYNNEOS is available for use in individuals younger than 18 years who are determined to be at high risk for mpox.[111]

Because myocarditis and pericarditis are recognized adverse events following ACAM2000 vaccination, a theoretic risk has been considered for JYNNEOS as well.[108] Although no minimal interval is required between the COVID-19 vaccine and orthopoxvirus vaccine, adolescent and young males recommended to receive both vaccines may consider an interval of 4 weeks between the vaccines as a precautionary measure.[108] In situations of increased risk for mpox or severe COVID-19, delaying vaccination is not recommended.[108]

When multiple immunizations are administered during the same visit, vaccines are administered at separate anatomic sites appropriate for the patient's age, either in the other limb or at least 1 inch apart when the same limb is used. An observational study that included pediatric participants found no major differences in antibody responses based on whether the COVID-19 and influenza vaccines were administered in the same or different arms.[112] CDC and AAP guidance does not establish a single maximum injection volume by muscle group for vaccine administration.

## ADDITIONAL RESOURCES

Current guidance, clinical resources, and updates related to COVID-19 are available through the AAP COVID-19 page (https://www.aap.org/en/patient-care/covid-19/), the AAP *Red Book Online* Respiratory Illness Season News and Resources page (https://publications.aap.org/redbook/resources/15189), and the CDC COVID-19 page

(https://www.cdc.gov/covid/). COVID-19 vaccine dosing schedules can be found in the AAP COVID Vaccine Dosing Quick Reference Guide (https://aap.org/CovidVaccineGuide).

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*The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.*

*All policy statements, clinical reports, and technical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.*

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*Embedded links to cdc.gov and fda.gov sites were active and reviewed as of June 30, 2026.*

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**Figure 1.** Cumulative rates of COVID-19-associated hospitalizations among children aged 0□17 years[11]

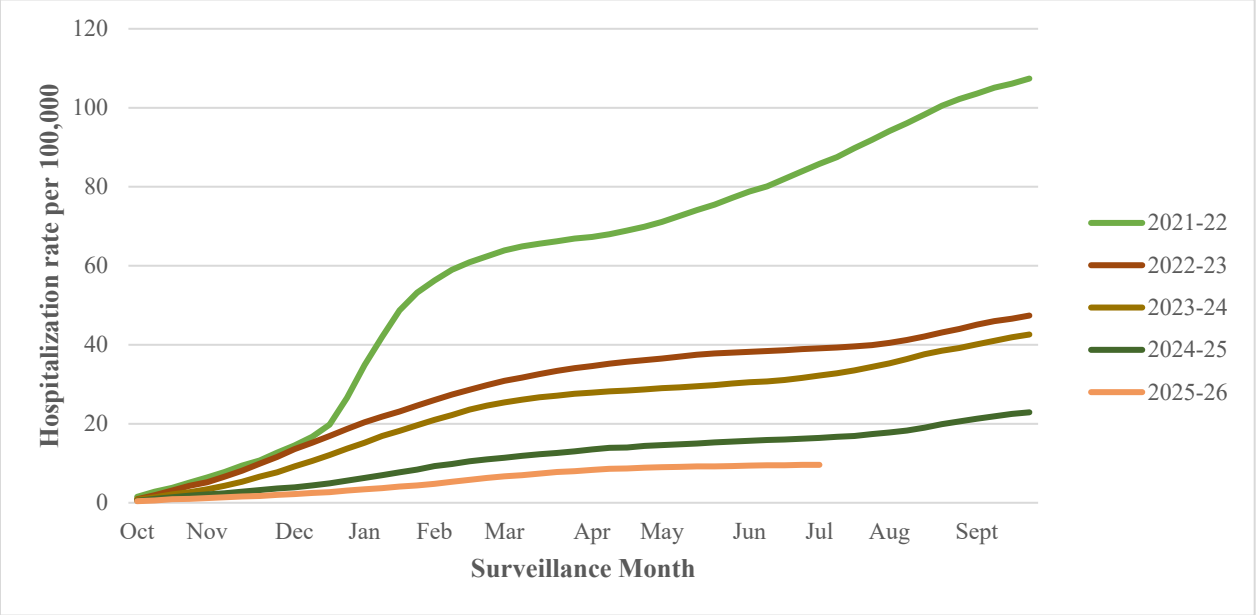

**Figure 2.** Cumulative rates of COVID-19-associated hospitalizations by age group, October 2024-September 2025[11]

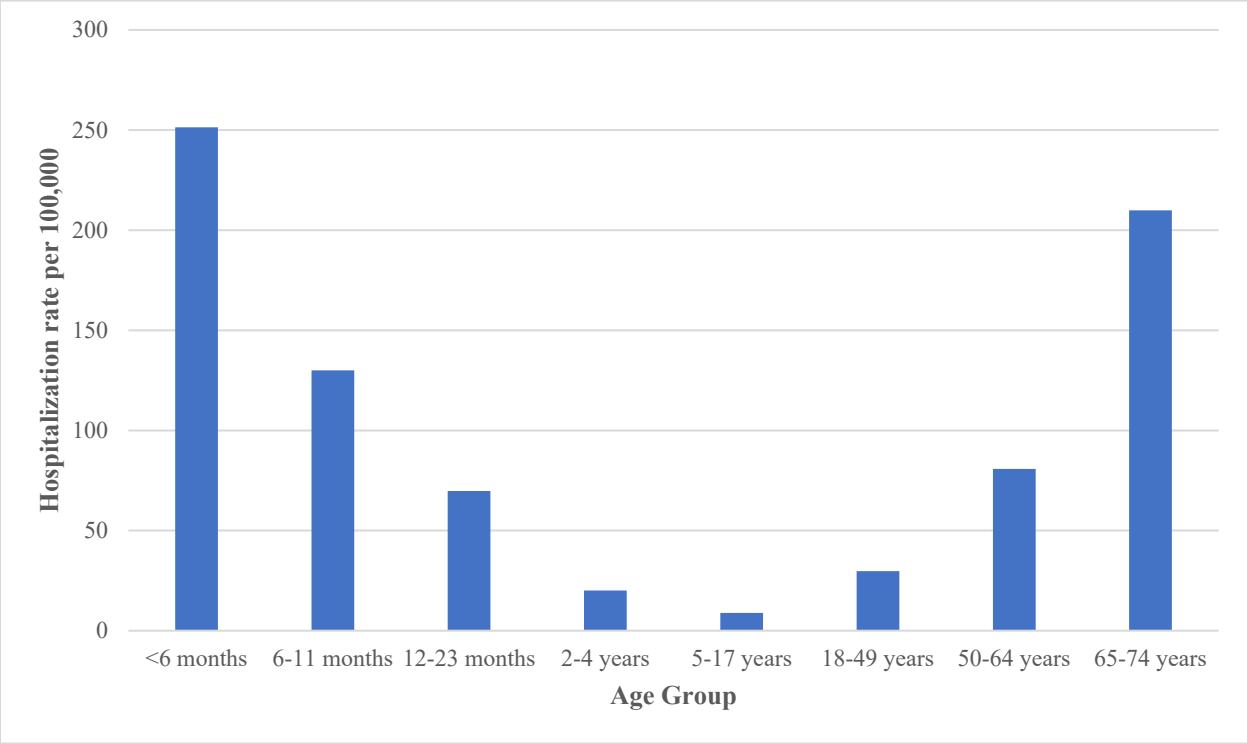

**Figure 3.** Cumulative rates of COVID-19-associated vs influenza-associated hospitalizations among children by age group, October 2024-September 2025[11,12]

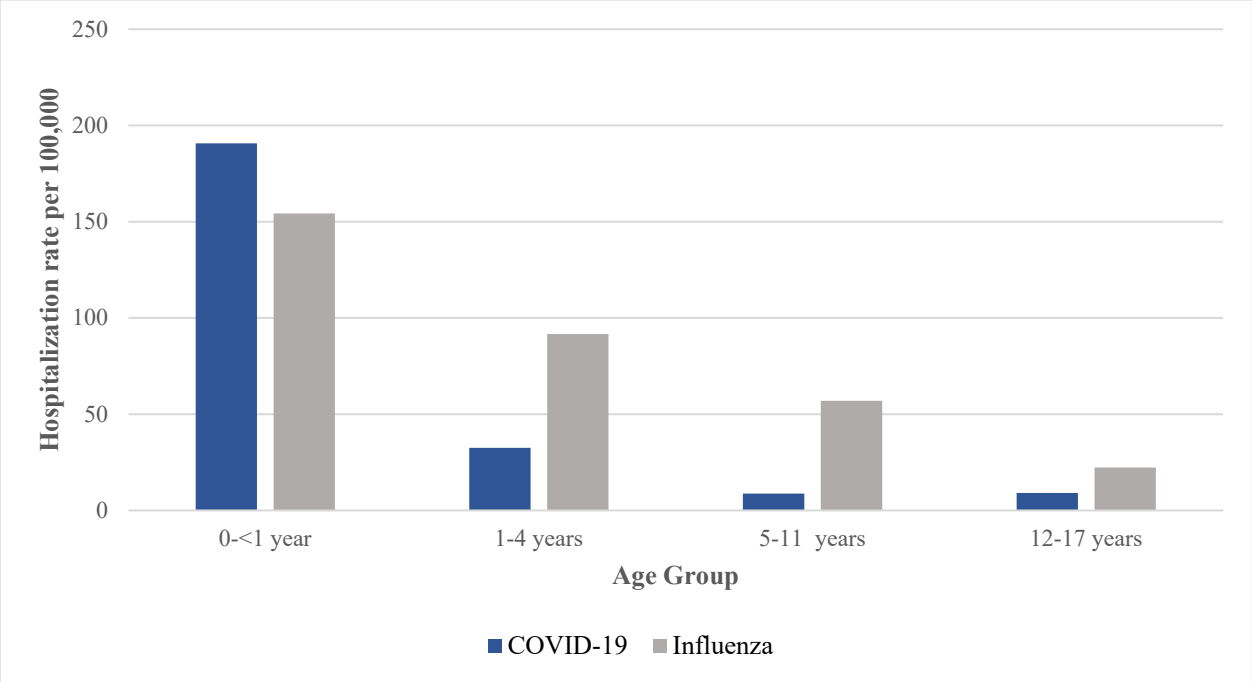

**Figure 4.** Total COVID-19-associated deaths among children by age group[14]

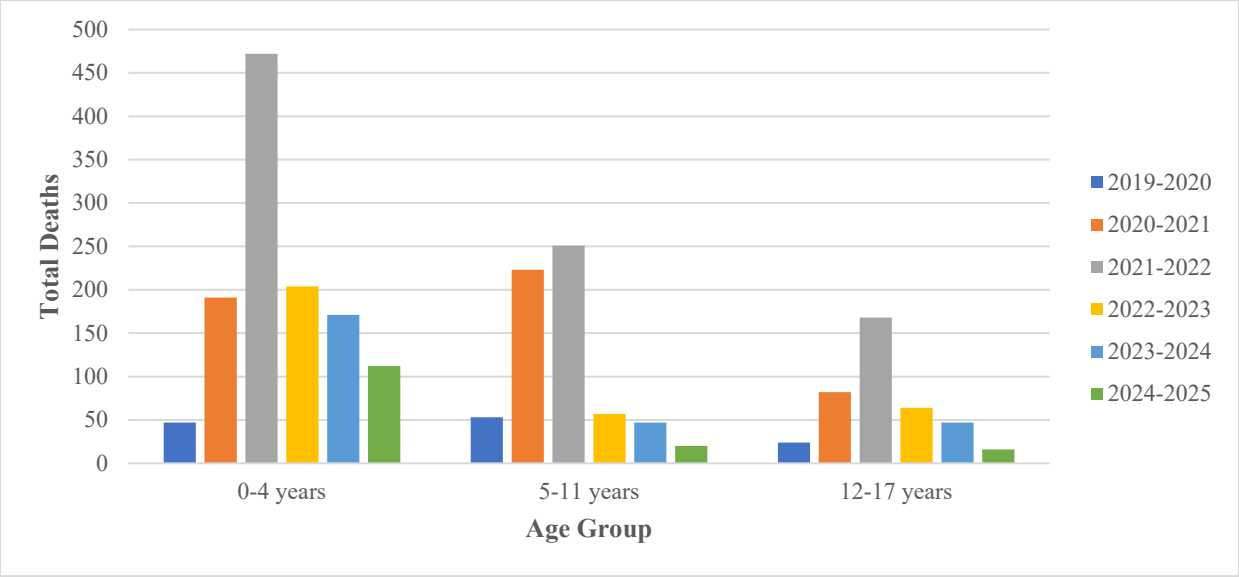

**Table 1. Pediatric Populations Recommended to Receive the COVID-19 Vaccine During the 2026–2027 Season**

| Population | Characteristics |
|---|---|
| Infants and children 6 through 23 months of age | Recommended for all in this age group. |
| Children and adolescents who are moderately or severely immunocompromised | See Box 1 for examples of qualifying conditions and treatments. These children may require additional vaccine doses.[a] |
| Children and adolescents at high risk of severe COVID-19 | See below for examples of medical conditions for which COVID-19 vaccination is recommended. |
| Residents of long-term care facilities or other congregate settings | Congregate care settings refer to places where individuals live together in structured environments outside of their home, including residential treatment facilities, group homes, emergency shelters, juvenile detention centers, etc. |
| Children and adolescents who have never been vaccinated against COVID-19 | Those who have not previously received vaccine-derived protection against COVID-19. |
| Children and adolescents with household contacts at high risk for severe COVID-19 | Household contacts may include infants and young children less than 24 months of age, adults aged ≥65 years, persons who are moderately or severely immunocompromised, and children, adolescents, or adults with medical conditions associated with severe COVID-19.[13,20] |
| **Underlying Conditions With Common Examples**[13,b] | |
| Chronic pulmonary disease | Asthma/reactive airway disease<br>Chronic lung disease of prematurity<br>Compromised respiratory function (eg, abnormality of airway, tracheostomy, or ventilator dependent) |
| Cardiovascular disease | Congenital heart disease |
| Gastrointestinal disorders | Feeding tube dependent<br>Inflammatory bowel disease |
| Hepatic disease | Chronic liver disease |
| Hematologic disease | Sickle cell disease |
| Metabolic disorders | Diabetes mellitus |
| Obesity | BMI ≥ the 95th percentile in children |
| Neurologic and neurodevelopmental conditions | Cerebral palsy<br>Epilepsy<br>Intellectual developmental disorder<br>Compromised mobility (eg, wheelchair dependent) |
| Immunosuppressive conditions | See Box 1 |
| Rheumatologic, autoimmune disease | Systemic lupus erythematosus<br>Juvenile idiopathic arthritis |

[a] Additional doses may be administered at ≥2-month intervals, informed by the clinical judgment of a health care provider and personal preference and circumstances. Refer to AAP Recommended Child and Adolescent Immunization Schedule for dosing guidance at AAP.org/ImmunizationSchedule.

[b] List of examples is not exhaustive.

**Box 1. Moderate and Severe Immunocompromising Conditions and Treatment[25]**

**Individuals may be considered moderately or severely immunocompromised if they have one or more of the following conditions or treatments. Examples include, but are not limited to, the following:**

- **Active treatment for solid tumor and hematologic malignancies**
- **Hematologic malignancies associated with poor responses to COVID-19 vaccines** regardless of current treatment status (eg, chronic lymphocytic leukemia, non-Hodgkin lymphoma, multiple myeloma, acute leukemia)
- **Receipt of solid-organ transplant or an islet transplant and taking immunosuppressive therapy**
- **Receipt of chimeric antigen receptor (CAR)-T-cell therapy or hematopoietic cell transplant (HCT)[a]**
- **Moderate or severe primary immunodeficiency** (eg, common variable immunodeficiency disease, severe combined immunodeficiency, DiGeorge syndrome, Wiskott-Aldrich syndrome)
- **Advanced[b] or untreated HIV infection**
- **Active treatment with immunosuppressive or immunomodulatory therapies[c]**

[a] Within 2 years of transplantation or taking immunosuppressive therapy

[b] Includes individuals with HIV and CD4 cell counts less than 200/mm$^3$, history of an AIDS-defining illness without immune reconstitution, or clinical manifestations of symptomatic HIV.

[c] Examples include high-dose corticosteroids (ie, 20 mg or more of prednisone or equivalent per day when administered for 2 or more weeks), alkylating agents, antimetabolites, transplant-related immunosuppressive drugs, cancer chemotherapeutic agents classified as severely immunosuppressive, tumor necrosis factor (TNF) blockers, and other biologic agents that are immunosuppressive or immunomodulatory (eg, B-cell-depleting agents).

**Table 2. COVID-19 Vaccines Available in the United States, 2026–2027 Season[a-d]**

| Vaccine Platform | Trade Name | Manufacturer | Authorized Age Groups | Antigen Content (per dose) | Dose Volume | Presentation |
|---|---|---|---|---|---|---|
| mRNA | Spikevax[49] | Moderna | 6 months–11 years | 25 mcg modRNA | 0.25 mL | Single-dose prefilled syringe |
| | | | ≥12 years | 50 mcg modRNA | 0.5 mL | Single-dose prefilled syringe |
| mRNA | mNEXSPIKE[50] | Moderna | ≥12 years | 10 mcg modRNA | 0.2 mL | Single-dose prefilled syringe |
| mRNA | Comirnaty[51] | Pfizer-BioNTech | 5–11 years | 10 mcg modRNA | 0.3 mL | Single-dose vial |
| | | | ≥12 years | 30 mcg modRNA | 0.3 mL | Single-dose prefilled syringe |
| Adjuvanted protein | Nuvaxovid[52] | Sanofi | ≥12 years | 5 mcg recombinant spike protein + 50 mcg Matrix-M adjuvant | 0.5 mL | Single-dose prefilled syringes |

[a] Refer to the current FDA-approved prescribing information (package insert) for the most up-to-date vaccine information.

[b] The FDA has authorized COVID-19 vaccines for use in individuals under 65 years of age who have at least 1 underlying condition that puts them at increased risk for severe outcomes from COVID-19.

[c] All COVID-19 vaccines listed are monovalent and contain the XFG antigen for the 2026–2027 season.

[d] Dosing schedules are available in the AAP COVID Vaccine Dosing Quick Reference Guide (https://downloads.aap.org/AAP/PDF/COVID Vaccine Dosing_Quick Reference.pdf).

**Table 3. Storage and Handling Specifications for COVID-19 Vaccines[a]**

| Vaccine | Frozen Storage | Refrigerated Storage, 2°C to 8°C (36°F to 46°F) | Room Temperature, 8°C to 25°C (46°F to 77°F) | Light Protection During Storage | Refreezing |
|---|---|---|---|---|---|
| Spikevax[49] | -50°C to -15°C (-58°F to 5°F) | After thawing, may be stored for up to 60 days or until expiration date, whichever occurs first | After thawing, may be stored for up to 12 hours | Minimize exposure to room light; avoid direct sunlight and ultraviolet (UV) light | Once thawed, do not refreeze |
| mNEXSPIKE[50] | -40°C to -15°C (-40°F to 5°F) | After thawing, may be stored for up to 90 days or until expiration date, whichever occurs first | After thawing, may be stored for up to 24 hours | Minimize exposure to room light; avoid direct sunlight and UV light | Once thawed, do not refreeze |
| Comirnaty (Single-Dose Vials)[51] | If received frozen at ultra-cold conditions, may be stored at -90°C to -60°C (-130°F to -76°F); do not store at -25°C to -15°C (-13°F to 5°F) | If received frozen at ultra-cold conditions, may be immediately transferred to refrigerator, thawed, and stored for up to 10 weeks; if received at 2°C to 8°C (36°F to 46°F), may be stored until previously recorded 10-week refrigerated expiration date | May be stored for up to 12 hours | Minimize exposure to room light; avoid direct sunlight and UV light | Once thawed, do not refreeze |
| Comirnaty (Prefilled Syringes)[51] | Do not freeze | Store refrigerated | May be stored for up to 12 hours | Minimize exposure to room light; avoid direct sunlight and UV light | Not applicable |
| Nuvaxovid[52] | Do not freeze | Store refrigerated | Not specified | Store in original carton | Not applicable |

[a] Refer to the current FDA-approved prescribing information (package insert) for the most up-to-date vaccine information.

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