POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

American Academy of Pediatrics
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Recommendations for Prevention and Control of Influenza in Children, 2023–2024

COMMITTEE ON INFECTIOUS DISEASES

abstract

This statement updates the recommendations of the American Academy of Pediatrics for the routine use of influenza vaccine and antiviral medications in the prevention and treatment of influenza in children during the 2023–2024 influenza season. A detailed review of the evidence supporting these recommendations is published in the accompanying technical report (www.pediatrics.org/cgi/doi/10.1542/peds.2023-063773). The American Academy of Pediatrics recommends annual influenza vaccination of all children without medical contraindications starting at 6 months of age. Children are at risk for hospitalization and death from influenza. Influenza vaccination is an important strategy for protecting children and the broader community, as well as reducing the overall burden of respiratory illnesses when other viruses are cocirculating. Any licensed influenza vaccine appropriate for age and health status can be administered, ideally as soon as possible in the season, without preference for one product or formulation over another.

Antiviral treatment of influenza is recommended for children with suspected (eg, influenza-like illness [fever with either cough or sore throat]) or confirmed influenza who are hospitalized, have severe or progressive disease, or have underlying conditions that increase their risk of complications of influenza, regardless of duration of illness. Antiviral treatment should be initiated as soon as possible. Antiviral treatment may be considered in the outpatient setting for symptomatic children with suspected or confirmed influenza disease who are not at high risk for influenza complications, if treatment can be initiated within 48 hours of illness onset. Antiviral treatment may also be considered for children with suspected or confirmed influenza disease whose siblings or household contacts either are younger than 6 months or have a high-risk condition that predisposes them to complications of influenza. Antiviral chemoprophylaxis is recommended for the prevention of influenza virus infection as an adjunct to vaccination in certain individuals, especially exposed children who are at high risk for influenza complications but have not yet been immunized or those who are not expected to mount an effective immune response.

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Address correspondence to Kristina A. Bryant, MD. E-mail: kristina.bryant@louisville.edu

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INTRODUCTION

Children consistently have the highest attack rates of influenza in the community during seasonal influenza epidemics. Children, especially those younger than 5 years and those with certain underlying medical conditions, can experience substantial morbidity, including severe or fatal complications, from influenza virus infection.[1] A higher risk of influenza hospitalization before 5 years of age has been noted in children born preterm (<37 weeks' gestation) or near term (37–38 weeks' gestation).[2] School-aged children bear a large influenza disease burden and are more likely to receive influenza-related medical care compared with healthy adults.[1,3] Children also play a pivotal role in the transmission of influenza virus infection to household and other close contacts.[1,3] Influenza vaccination of children not only reduces disease burden among children, but also among household and community members of all ages.[1,3] By reducing the burden of respiratory illnesses, influenza vaccination helps to preserve health care capacity, especially when other viruses are cocirculating. **The American Academy of Pediatrics (AAP) recommends routine influenza vaccination and use of antiviral agents for the prevention and treatment of influenza in children, respectively.** Unfortunately, influenza vaccination coverage continued to lag during the 2022–2023 influenza season. Through April 15, 2023, only 55.1% of children 6 months through 17 years had been vaccinated.[4] Although overall estimates are comparable to those in the 2021–2022 influenza season, coverage levels are 7.1 percentage points lower than at the start of the coronavirus disease 2019 (COVID-19) pandemic (April 2020). Disparities in immunization rates persist: Vaccination coverage is lower for non-Hispanic Black children (51%) compared with non-Hispanic white children (53.6%), Hispanic children (58%), and children whose race was reported as other, non-Hispanic race/ethnicity (60%; includes Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, multiracial, and children whose parents reported their race as "other").[4] In addition, coverage levels were markedly lower among children residing in rural versus suburban or urban areas (41.1% vs 55.3% vs 59.8%, respectively). Efforts to increase influenza vaccination, including strategies to decrease disparities in access to vaccine and credible vaccine information and counter vaccine hesitancy, are urgently needed.

This policy statement summarizes updates and recommendations for the 2023–2024 influenza season. An accompanying technical report provides further detail regarding recent influenza seasons, influenza vaccine effectiveness, detailed discussion of inactivated and live-attenuated influenza vaccines (LAIV), vaccine storage, vaccination coverage, timing of vaccination, duration of protection, and vaccine delivery strategies.[5]

UPDATES FOR THE 2023–2024 INFLUENZA SEASON

1. The composition of the influenza vaccines for the 2023–2024 season has been updated (Table 1).
    a. The recommended influenza A (H1N1) pdm09 component of the vaccine is new for this season.[6,7]
    b. The influenza A (H3N2), influenza B Yamagata lineage and influenza B Victoria lineage components are unchanged from the previous season.[6,7]
2. Recommendations for influenza vaccination of immunocompromised hosts are clarified.
3. Recommendations for improving access to influenza vaccine are emphasized.
4. Indications for influenza testing are highlighted, including a discussion of at-home testing.

HIGH-RISK GROUPS IN PEDIATRICS

Children younger than 5 years, especially those younger than 2 years, and children with certain underlying medical conditions are at increased risk of hospitalization and complications attributable to influenza (Table 2).[5] Although influenza vaccination is recommended for everyone starting at 6 months, emphasis should be placed on ensuring that high-risk and medically vulnerable children and their household contacts and caregivers receive annual influenza vaccines (Table 3). Additionally, increased efforts are needed to eliminate barriers to vaccination in all persons experiencing higher rates of adverse outcomes from influenza. Racial and ethnic disparities exist in severe outcomes from influenza. In one cross-sectional study spanning 10 influenza seasons, Black, Hispanic, and American Indian/Alaska Native people had higher rates of influenza-associated hospitalizations and ICU admissions, and disparities were highest in children ≤4 years of age.[8] Influenza-associated in-hospital deaths were 3- to fourfold higher in Black, Hispanic, and Asian/Pacific Islander children compared with white children.[8] These higher fatality rates may be attributable to already existing causes for disparities, such as inequities in health care system access or other social determinants of health.

TABLE 1 Quadrivalent Influenza Vaccine Composition for the 2023–2024 Season

	Specific Strain
Influenza A	
H1N1	A/Victoria/4897/2022 (H1N1)pdm09-like virus; (egg-based)[a]
	A/Wisconsin/67/2022 (H1N1)pdm09-like virus; (cell culture-based or recombinant)[a]
H3N2	A/Darwin/9/2021 (H3N2)-like virus; (egg-based)[b]
	A/Darwin/6/2021 (H3N2)-like virus; (cell culture-based or recombinant)[b]
Influenza B	
Victoria	B/Austria/1359417/2021-like virus; (B/Victoria lineage)[b]
Yamagata	B/Phuket/3073/2013-like virus (B/Yamagata lineage)[b]

Trivalent vaccines (not available in the United States) do not include the B/Yamagata component.
[a] New this season.
[b] Unchanged this season.

TABLE 2 High-Risk Groups for Influenza Complications	
Category	**Description**
Demographic characteristics	Children <5 y, especially those <2 y[a]
	Children born preterm or near term[b]
	Residents of a chronic care facility or nursing home
Underlying condition or treatment with common examples[c]	
Chronic pulmonary disease	Asthma[11]
	Cystic fibrosis
	Bronchopulmonary dysplasia[11]
	Compromised respiratory function (eg, requiring mechanical ventilation, tracheostomy)
Cardiovascular disease	Hemodynamically significant conditions (excluding hypertension alone)
Kidney disease	Chronic kidney disease, including end-stage kidney disease
	Dialysis
Hepatic disease	Chronic liver disease
	Cirrhosis[12,13]
Hematologic disease	Sickle cell disease
	Other hemoglobinopathies
Metabolic disorders	Diabetes mellitus
Neurologic and neurodevelopmental conditions	Cerebral palsy
	Epilepsy
	Stroke
	Intellectual developmental disorder
	Moderate to severe developmental delay
	Muscular dystrophy
	Spinal cord injury
Extreme obesity	BMI ≥40 for adults[d]
Immunosuppression	Receipt of immunocompromising medications
	Receipt of bone marrow, hematopoietic stem cell transplant, and solid organ transplant
	Congenital or acquired immune deficiency, including HIV
	Asplenia
Receiving treatment with aspirin- or salicylate-containing therapies[e]	
Pregnancy and up to 2 wk postpartum	

Source: Adapted from Grohskopf LA, Blanton LH, Ferdinands JM, Chung JR, Broder KR, Talbot HK. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices—United States, 2023–24 influenza season. *MMWR Recomm Rep.* 2023;72(2):1–25.

[a] Regardless of the presence of underlying medical conditions.

[b] Higher risk of influenza hospitalization in the first 5 years of life.

[c] List of examples is not exhaustive.

[d] BMI associated with increased risk not well defined in children, but could consider BMI at or above the 95th percentile for children and teens of the same age and sex.[14,15]

[e] Applies to children and adolescents aged <19 years who may be at increased risk of Reye syndrome.

SEASONAL INFLUENZA VACCINES

The seasonal influenza vaccines licensed for children for the 2023–2024 season are shown in Table 4. More than one product may be appropriate for a given patient, and there is no preference for one product over another. Thus, influenza vaccination should not be delayed to obtain a specific product.

All 2023–2024 seasonal influenza vaccines are quadrivalent and contain hemagglutinin derived from the same influenza strains as recommended by the World Health Organization's and the US Food and Drug Administration's Vaccines and Related Biological Products Advisory Committee for the Northern Hemisphere (Table 1).[6,7] The influenza A (H1N1) vaccine component for the 2023–2024 season is different this year, whereas the influenza A (H3N2), influenza B Victoria lineage, and influenza B Yamagata lineage components are unchanged. Different, but antigenically related, influenza A strains are included in this season's egg-based and cell-based or recombinant vaccines. They are matched to the strains expected to circulate in the 2023–2024 season.

INFLUENZA VACCINE RECOMMENDATIONS

1. The AAP recommends influenza vaccination of everyone 6 months and older, including children and adolescents, during the 2023–2024 influenza season.
2. The AAP recommends any licensed influenza vaccine product appropriate for age and health status and does not prefer one product over another, including IIV and LAIV. Recombinant influenza vaccine (RIV) is another option for persons ≥18 years of age. Providers may administer whichever product is appropriate and readily available to capture all opportunities for influenza vaccination and achieve the highest possible coverage this season.
3. LAIV should not be used for immunocompromised persons and persons with some chronic medical conditions (Table 5).
4. The number of influenza vaccine doses recommended for children remains unchanged in the 2023–2024 influenza season and depends on the child's age at first dose administration and influenza vaccination history (Fig 1). Children 6 months through 8 years of age who are receiving influenza vaccine for the first time, who received only 1 dose before July 1, 2023, or whose vaccination status is unknown should receive 2 doses of influenza vaccine at least 4 weeks apart. Doses given up to 4 days before the minimum suggested interval should be regarded as acceptable. All other children should receive 1 dose this season. For children aged 8 years who require 2 doses of influenza vaccine, both doses should be administered even if the child turns age 9 years between dose 1 and dose 2.
5. The total number of full doses appropriate for age should be administered. If a child is inadvertently vaccinated with a formulation only approved for older children or adults, the dose should be counted as valid. If a lower dose than recommended is inadvertently administered to a child 36 months or older

TABLE 3 Strategies for Increasing Childhood Influenza Vaccination	
	Strategy
Provider/care team	Offer a strong, presumptive influenza vaccine recommendation.
	Bundle the recommendation for influenza vaccine with recommendations for other needed vaccines.
	Use consistent messaging across care team members.
	Identify influenza vaccine champion(s).
Practice/health systems	Review influenza vaccination status at all visits.
	Bundle influenza vaccine with other needed vaccines.
	Vaccinate at all visit types (eg, well child, acute care visits).
	Vaccinate in all health care settings (eg, hospital, emergency department, subspecialty practice).
	Increase access to influenza vaccine (eg, expanded hours, vaccine-only clinic).
	Provide evidence-based information to patients and families (eg, office-based educational handout).
	Send influenza vaccine reminder/recall messages.
	Use EHR-based tools to identify and classify high-risk patients for targeted outreach.
	Use standing orders for influenza vaccine.
	Implement influenza vaccine provider prompts/clinical decision support.
	Perform audits and share feedback reports.
Community/public health	Integrate EHR with regional or state immunization information system and automate reconciliation of electronically received immunization data for influenza vaccines.
	Partner with stakeholders to support vaccine initiatives within the community, including school-based programs and pharmacies.
	Engage with communities affected by health disparities to develop tailored strategies that promote trust, encourage dialogue, and increase access to preventive services.
EHR, electronic health record.	

(eg, 0.25 mL), an additional 0.25-mL dose should be administered to provide a full dose of 0.5 mL as soon as possible. A 0.5-mL dose of any IIV should not be split into 2 separate 0.25-mL doses.

6. When a child is recommended to receive 2 doses of vaccine in a given season, the doses do not need to be the same brand. A child may receive a combination of IIV and LAIV if appropriate for age and health status.
7. Influenza vaccine should be offered to children as soon as it becomes available, especially to those recommended to receive 2 doses. The recommended dose(s) ideally should be received by the end of October for optimal protection before the influenza season begins. Most adults, particularly those ≥65 years and pregnant persons in the first or second trimester, should not be immunized in July and August because of a concern about waning immunity. Influenza vaccination efforts should continue throughout the season.
8. IIV (or RIV if age-appropriate) may be administered simultaneously with or at any time before or after other inactivated or live vaccines. LAIV may be administered simultaneously with other live or inactivated vaccines, including COVID-19 vaccines. If not administered simultaneously, ≥4 weeks should pass between the administration of LAIV and other nonoral live vaccines. A 4-day grace period is permitted.
9. For children with malignant neoplasms, the optimal time to provide IIV is not well defined, but generally, vaccine should be administered ≥2 weeks before cytotoxic chemotherapy when clinically possible.
10. For children who have received anti-B cell therapies in the previous 6 months, IIV should be deferred until there is evidence of B cell recovery. Household contacts of these immunocompromised individuals should receive influenza vaccine annually.
11. For hematopoietic stem cell recipients, IIV can be given starting 4 to 6 months after transplantation. For solid organ transplant (SOT) recipients, IIV can be given beginning at 3 months after receipt of an SOT, although it may be considered ≥1 month after receipt of an SOT during the influenza season.
12. Pregnant individuals may receive IIV (or RIV if age-appropriate) at any time during pregnancy to protect themselves and their infants. Those who do not receive it during pregnancy should receive influenza vaccine before hospital discharge. Influenza vaccination is safe for the breastfeeding parent and infant.
13. Pediatricians who interact with pregnant individuals should recommend influenza vaccination, emphasizing the benefits of vaccination for them and their infants.
14. Individuals in the postpartum period who did not receive influenza vaccine during pregnancy should be offered influenza vaccination before hospital discharge. Those who decline the vaccine during hospitalization should be encouraged to discuss influenza vaccination with their obstetrician, family physician,

TABLE 4 Recommended Seasonal Influenza Vaccines for Children and Adolescents: United States, 2023–2024 Influenza Season

Vaccine	Trade Name (Manufacturer)	Age Group	Presentation and Hemagglutinin Antigen Content (IIVs and RIV4) or Virus Count (LAIV4) Per Dose for Each Antigen	Recommended Dose	Thimerosal Mercury Content[a] (μg Hg/0.5-mL Dose)
Quadrivalent standard dose: Egg-based vaccines					
IIV4	Afluria	≥6–35 mo[b]	5.0-mL multidose vial[c] (15 μg/0.5 mL)	0.25 mL	24.5
	Quadrivalent (Seqirus)	≥36 mo	5.0-mL multidose vial[c] (15 μg/0.5 mL)	0.5 mL	24.5
		≥36 mo	0.5-mL prefilled syringe (15 μg/0.5 mL)	0.5 mL	0
IIV4	Fluarix	≥6 mo	0.5-mL prefilled syringe (15 μg/0.5 mL)	0.5 mL	0
	Quadrivalent (GlaxoSmithKline)				
IIV4	FluLaval	≥6 mo	0.5-mL prefilled syringe (15 μg/0.5 mL)	0.5 mL	0
	Quadrivalent (GlaxoSmithKline)				
IIV4	Fluzone	≥6 mo	0.5-mL prefilled syringe (15 μg/0.5 mL)	0.5 mL	0
	Quadrivalent (Sanofi Pasteur)	≥6–35 mo	0.5-mL single-dose vial[d,e] (15 μg/0.5 mL)	0.25 or 0.5 mL	0
		≥36 mo	0.5-mL single-dose vial[d,e] (15 μg/0.5 mL)	0.5 mL	0
		6–35 mo	5.0-mL multidose vial[c,d] (15 μg/0.5 mL)	0.25 or 0.5 mL	25
		≥36 mo	5.0-mL multidose vial[c,d] (15 μg/0.5 mL)	0.5 mL	25
Quadrivalent standard dose: Cell culture-based vaccines					
ccIIV4	Flucelvax Quadrivalent (Seqirus)	≥6 mo	0.5-mL prefilled syringe (15 μg/0.5 mL)	0.5 mL	0
		≥6 mo	5.0-mL multidose vial[c] (15 μg/0.5 mL)	0.5 mL	25
Recombinant vaccine					
RIV4	Flublok	≥18 y	0.5-mL prefilled syringe (45 μg/0.5 mL)	0.5 mL	0
	Quadrivalent (Sanofi Pasteur)				
LAIV: Egg-based vaccine					
LAIV4	FluMist Quadrivalent (AstraZeneca)	2–49 y	0.2-mL prefilled intranasal sprayer (virus dose: $10^{6.5–7.5}$ FFU/0.2 mL)	0.2 mL	0

Data sources: Grohskopf LA, Blanton LH, Ferdinands JM, Chung JR, Broder KR, Talbot HK. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP)—United States, 2023–24 influenza season. *MMWR Recomm Rep.* 2023;72(2):1–25. Implementation guidance on supply, pricing, payment, billing, coding, and liability issues can be found at aap.org/influenza. IIV4, quadrivalent adjuvanted inactivated influenza vaccine; ccIIV4, quadrivalent cell culture-based inactivated influenza vaccine; FFU, fluorescent focus unit; LAIV4, quadrivalent live-attenuated influenza vaccine; RIV4, quadrivalent recombinant influenza vaccine.

[a] See Thimerosal-containing vaccines in the technical report.[5]

[b] The dose is 0.25 mL for children 6 through 35 months of age and 0.5 mL for children 3 years and older.

[c] For vaccines that include a multidose vial presentation, the maximum number of doses withdrawn should not exceed the number specified in the package insert (eg, 10 doses for Fluzone, 20 doses for Afluria). Residual product should be discarded.

[d] A total of 0.25 mL drawn from a single or multidose vial is an acceptable dose for children 6 to 35 months of age.

[e] Single-dose vials should be used for only 1 dose (0.25 mL or 0.5 mL). Residual product remaining in the vial should be discarded.

nurse midwife, or other trusted medical provider. Information about free influenza vaccine clinics should be provided in the preferred language to these individuals, especially those who may experience barriers to preventive care.

15. Individuals traveling to the tropics, on cruise ships, or to the Southern Hemisphere during April to September should consider influenza vaccination ≥2 weeks before departure if not vaccinated during the preceding fall or winter and if vaccine is available.
16. Efforts should be made to promote influenza vaccination of all children, especially in children younger than 5 years and those in high-risk groups (Table 2) and their contacts, unless contraindicated (Table 5). To promote influenza vaccination in communities affected by health disparities, it is important to include community members in the development of culturally relevant strategies. Evidence-based strategies for increasing influenza vaccine uptake are presented in Table 3.
17. Increasing access and reducing barriers to vaccination in schools, pharmacies, and other nontraditional settings could improve vaccination rates, although vaccination in the medical home is optimal for young children to facilitate other necessary services, including well care, preventive screening, anticipatory guidance, and other important childhood vaccinations. When influenza vaccination takes place in a nontraditional setting, appropriate documentation should be provided to patients and to the medical home. Settings that offer influenza vaccination should submit details about the vaccination to the appropriate immunization information systems (IISs), including all content needed to support communication of this information to the patient's medical home.
18. Practices serving children and adolescents may consider offering influenza vaccine to family members and close contacts.[9]
19. Efforts should be made to eliminate disparities in influenza vaccine supply between privately insured patients

TABLE 5 Influenza Vaccine Contraindications and Precautions

Vaccine	Contraindication	Precaution	Provider Discretion	Not Contraindication or Precaution
IIV[a]	Anaphylaxis or severe allergic reaction to previous influenza vaccination	• Moderate to severe illness, including COVID-19		• Mild illness, with or without fever
		• History of Guillain-Barre syndrome within 6 wk of previous influenza vaccination		• Egg allergy
LAIV	• Anaphylaxis or severe allergic reaction to previous influenza vaccination	• Moderate to severe illness, including COVID-19	• Defer to resolution of symptoms or use IIV if a patient has nasal congestion that could impede vaccine delivery.	• Mild illness, with or without fever
	• Allergy to gelatin	• History of Guillain-Barre syndrome within 6 wk of previous influenza vaccination		• Egg allergy
	• Age 2–4 y with diagnosis of asthma or history of wheezing in last 12 mo	• Diagnosis of asthma and age ≥5 y		
	• Cochlear implants	• Certain underlying chronic conditions that might predispose to complications after influenza (eg, chronic pulmonary disease, cardiovascular disease, and renal, hepatic, neurologic, hematologic, or metabolic disorders)		
	• Active cerebrospinal fluid leaks			
	• Immunosuppression because of any cause, including: Primary or acquired immunodeficiency, including HIV; immunosuppressive or immunomodulatory therapy; natomic or functional asplenia			
	• Close contacts or caregivers of severely immunocompromised individuals			
	• Taking aspirin- or salicylate-containing medications			
	• Receiving or recently received influenza antiviral medication[b]			
	• Currently pregnant			
RIV4	Anaphylaxis or severe allergic reaction to previous dose of RIV4 or any component of RIV4	• Moderate to severe illness, including COVID-19		• Mild illness, with or without fever
		• History of Guillain-Barre syndrome within 6 wk of previous influenza vaccination		• Egg allergy

HA, hemagglutinin; RIV4, recombinant influenza vaccine.
[a] IIVs for children include Afluria Quadrivalent, Fluarix Quadrivalent, FluLaval Quadrivalent, Fluzone Quadrivalent, and Flucelvax quadrivalent.
[b] Within 48 hours (oseltamivir, zanamivir), 5 days (peramivir), or 17 days (baloxavir) of stopping influenza antiviral therapy.

and those eligible for vaccination through the Vaccines for Children program.

20. Public and private payers should offer adequate payment for influenza vaccine supply and administration to pediatric populations, update payments for influenza vaccine so that providers are paid for administering doses in July and August, and eliminate remaining "patient responsibility" cost barriers to influenza vaccination where they still exist.
21. The AAP supports mandatory influenza vaccination of health care personnel as a crucial strategy for reducing health care-associated influenza virus infections.

INFLUENZA VACCINE CONTRAINDICATIONS AND PRECAUTIONS

Contraindications and precautions for the use of influenza vaccines are described in Table 5, and further details are provided in the technical report.[5] Key points include:

1. Product-specific contraindications must be considered when selecting the type of influenza vaccine to administer.[10]
2. Although a history of severe allergic reaction (eg, anaphylaxis) to any influenza vaccine is generally a contraindication to future receipt of influenza vaccines, children who have had a severe allergic reaction after influenza vaccination should be evaluated by an allergist to help identify the vaccine component responsible for the reaction and to determine whether future vaccine receipt is appropriate. Children who are allergic to gelatin (very rare) should receive IIV (or RIV if age-appropriate) instead of LAIV.
3. Children with egg allergy can receive any influenza vaccine without any additional precautions beyond those recommended for all vaccines.
4. Children with acute moderate or severe illness, including COVID-19, may receive influenza vaccine as soon as their

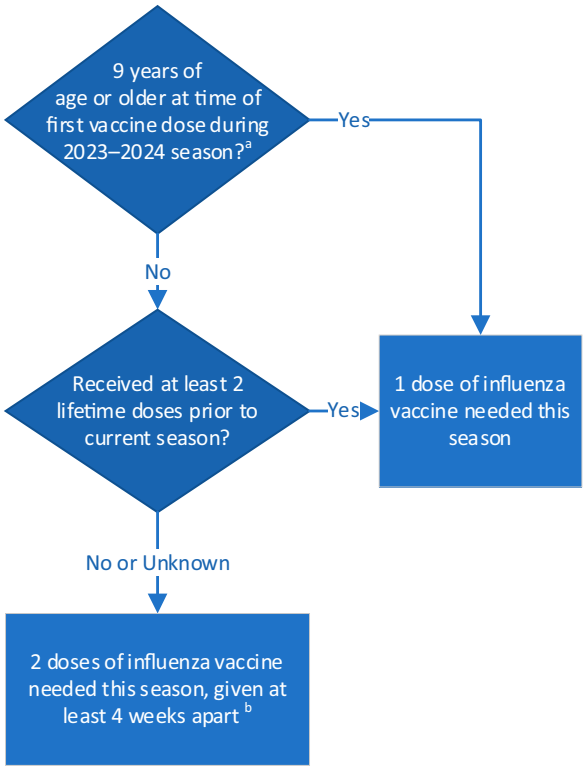

FIGURE 1

Number of 2023–2024 seasonal influenza vaccine doses recommended for children on the basis of age and previous 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 years between first and second dose.

acute illness has improved; children with mild illness, including a low-grade fever, can still be vaccinated.

INFLUENZA TESTING

1. Influenza testing should be performed in children with signs and symptoms of influenza when test results are anticipated to impact clinical management (eg, to inform the decision to initiate antiviral therapy, pursue other diagnostic testing, initiate infection prevention and control measures, or distinguish from other respiratory viruses with similar symptoms [eg, severe acute respiratory syndrome coronavirus 2]).
2. When influenza is circulating in the community, hospitalized patients with signs and symptoms of influenza should be tested with a molecular assay with high sensitivity and specificity (eg, reverse-transcription polymerase chain reaction).
3. At-home tests are available for children as young as 2 years of age but data on the use of these tests in pediatric patients is limited. The use of at-home test results to inform treatment decisions should be informed by the sensitivity and specificity of the test, the prevalence of influenza in the community, the presence and duration of compatible signs and symptoms, and individual risk factors and comorbidities.

INFLUENZA TREATMENT RECOMMENDATIONS

Antiviral medications available for the treatment and prophylaxis of influenza in children are described in Table 6. Key points include:

1. Antiviral medications are an important adjunct in the control of influenza but are not a substitute for influenza vaccination. Providers should promptly identify patients suspected of having influenza for timely initiation of antiviral treatment, when indicated and based on shared decision-making between the provider and child's caregiver, to reduce morbidity and mortality. Potential benefits and harms of antiviral treatment are summarized in the technical report ([www.pediatrics.org/cgi/doi/10.1542/peds.2023-063773] see section "Rationale for Influenza Treatment in Children").[5]
2. Oseltamivir is the preferred antiviral medication for patients with influenza A and B because of the cumulative experience of this drug in children, relative cost, and ease of administration.
3. Although best results are observed when the child is treated within 48 hours of symptom onset, antiviral therapy should still be considered beyond 48 hours in certain cases (see below).
4. Antiviral treatment should be offered as early as possible to the following individuals, regardless of influenza vaccination status and duration of symptoms:
   - Any child hospitalized with suspected or confirmed influenza disease
   - Any child with severe, complicated, or progressive influenza disease, regardless of health care setting (ie, inpatient or outpatient)
   - Any child with suspected or confirmed influenza disease of any severity if they are at high risk for influenza complications, regardless of health care setting (ie, inpatient or outpatient) (Table 2)
5. Develop systems that enable patients to quickly access treatment near the onset of symptoms.
6. Treatment may be considered for the following individuals in the outpatient setting, after discussing benefits and risks with parents/guardians:
   - Any child with suspected or confirmed influenza disease who is not at high risk for influenza complications, if treatment can be initiated within 48 hours of illness onset
   - Any child with suspected or confirmed influenza disease whose siblings or household contacts are either younger than 6 months or at high risk for influenza complications (Table 2)
7. Initiation of antiviral therapy should be based on signs and symptoms consistent with influenza infection and

TABLE 6 Recommended Dosage and Schedule of Influenza Antiviral Medications for Treatment and Chemoprophylaxis in Children for the 2023–2024 Influenza Season: United States

Medication	Treatment		Chemoprophylaxis		Common Adverse Events
	Dosage	Duration	Dosage	Duration After Last Exposure	
Oseltamivir[a,b]					
Adults	75 mg, twice daily	5 d	75 mg, once daily	7 d	Nausea Vomiting Headache Skin reactions Diarrhea (children aged <1 y)
Children ≥12 mo					
≤15 kg	30 mg, twice daily	5 d	30 mg, once daily	7 d	
>15 kg–23 kg	45 mg, twice daily	5 d	45 mg, once daily	7 d	
>23 kg–40 kg	60 mg, twice daily	5 d	60 mg, once daily	7 d	
>40 kg	75 mg, twice daily	5 d	75 mg, once daily	7 d	
Infants 9–11 mo[c]	3.5 mg/kg per dose, twice daily	5 d	3.5 mg/kg per dose, once daily	7 d	
Term infants 0–8 mo[c]	3.0 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	
Preterm infants[d]					
<38 wk PMA	1.0 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	
38–40 wk PMA	1.5 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	
>40 wk PMA	3.0 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	
Zanamivir[b,e]					
Adults	10 mg (2 5-mg inhalations), twice daily	5 d	10 mg (2 5-mg inhalations), once daily	7 d[b]	Bronchospasm Skin reactions
Children	≥7 y: 10 mg (2 5-mg inhalations), twice daily	5 d	≥5 y: 10 mg (2 5-mg inhalations), once daily	7 d[b]	
Peramivir[f]					
Adults	1 600-mg dose via intravenous infusion, given over 15–30 min	N/A	Not recommended		Diarrhea Skin reactions
Children 6 mo–12 y	1 12 mg/kg-dose (600 mg maximum) via intravenous infusion over 15–30 min	N/A	Not recommended		
13–17 y	1 600-mg dose, via intravenous infusion over 15–30 min	N/A	Not recommended		
Baloxavir[g]					
Individuals ≥5 y					Nausea Vomiting Diarrhea
<20 kg	2 mg/kg as single dose, orally	N/A	2 mg/kg as single dose, orally	N/A	
20 kg–<80 kg	1 40-mg dose, orally	N/A	1 40-mg dose, orally	N/A	
≥80 kg	1 80-mg dose, orally	N/A	1 80-mg dose, orally	N/A	

Sources: Infectious Diseases Society of America[16] and https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm. N/A, not applicable; PMA, postmenstrual age.

[a] Oseltamivir is administered orally without regard to meals, although administration with meals may improve gastrointestinal tolerability. Oseltamivir is available as a generic drug or as Tamiflu in 30-mg, 45-mg, and 75-mg capsules, and as a powder for oral suspension that is reconstituted to provide a final concentration of 6 mg/mL. For the 6-mg/mL suspension, a 30-mg dose is given with 5 mL of oral suspension, a 45-mg dose is given with 7.5 mL oral suspension, a 60-mg dose is given with 10 mL oral suspension, and a 75-mg dose is given with 12.5 mL oral suspension. If the commercially manufactured oral suspension is not available, a suspension can be compounded by retail pharmacies (final concentration also 6 mg/mL) on the basis of instructions contained in the package label. In patients with renal insufficiency, the dose should be adjusted on the basis of creatinine clearance. For treatment of patients with creatinine clearance 10–30 mL per minute: 75 mg, once daily, for 5 days. For chemoprophylaxis of patients with creatinine clearance 10–30 mL per min: 30 mg, once daily, for 10 days after exposure; or 75 mg, once every other day, for 10 days after exposure (5 doses). See https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm and Infectious Diseases Society of America guidelines.[16] These recommendations differ from the package insert for oseltamivir: https://www.accessdata.fda.gov/drugsatfda_docs/label/2012/021087s062lbl.pdf.

[b] The Centers for Disease Control and Prevention recommends routine chemoprophylaxis with oseltamivir or zanamivir for 7 days after last known exposure; minimum of 14 days and continuing for 7 days after last known exposure if part of institutional outbreak (https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm). This differs from the package insert for zanamivir, which recommends prophylaxis for 10 days in community settings and 28 days in community outbreaks (https://www.accessdata.fda.gov/drugsatfda_docs/label/2010/021036s025lbl.pdf).

[c] Approved by the US Food and Drug Administration for children as young as 2 weeks of age. Given preliminary pharmacokinetic data and limited safety data, oseltamivir can be used to treat influenza in both term and preterm infants from birth because benefits of therapy are likely to outweigh possible risks of treatment. Oseltamivir is not recommended for chemoprophylaxis for infants aged <3 months because of limited safety and efficacy data in this age group. Of note, the Centers for Disease Control and Prevention recommends a 3.0 mg/kg/dose, twice daily, for all infants aged <12 mo; the Infectious Diseases Society of America guidelines[16] include both AAP and Centers for Disease Control and Prevention recommendations.

[d] Oseltamivir dosing for preterm infants. The weight-based dosing recommendation for preterm infants is lower than for term infants. Preterm infants may have lower clearance of oseltamivir because of immature renal function, and doses recommended for full-term infants may lead to very high drug concentrations in this age group. Limited data from the National Institute of Allergy and Infectious Diseases Collaborative Antiviral Study Group provide the basis for dosing preterm infants using their postmenstrual age (gestational age + chronologic age). For extremely preterm infants (<28 weeks), please consult a pediatric infectious disease physician.

[e] Zanamivir is administered by inhalation using a proprietary "Diskhaler" device distributed together with the medication. Zanamivir is a dry powder, not an aerosol, and should not be administered using nebulizers, ventilators, or other devices typically used for administering medications in aerosolized solutions. Zanamivir is not recommended for people with chronic respiratory diseases, such as asthma or chronic obstructive pulmonary disease, which increase the risk of bronchospasm.

[f] Peramivir requires dose adjustment in patients with renal insufficiency. For treatment of pediatric patients 6 months to 12 years of age: 2 mg/kg if creatinine clearance 10–29 mL per minute; 4 mg/kg if creatinine clearance is 20 to 49 mL per minute. For treatment of adolescents 13 years and older, 100 mg if creatinine clearance 10–29 mL per minute; 200 mg if creatinine clearance is 20 to 49 mL per minute. (https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/206426s004lbl.pdf).

[g] Oral baloxavir marboxil is approved by the US Food and Drug Administration for treatment of acute uncomplicated influenza within 2 days of illness. Baloxavir marboxil is not recommended as monotherapy for treatment of influenza in individuals who are severely immunocompromised, pregnant, or breastfeeding.

epidemiologic factors. Provision of antiviral therapy does not require a positive test for influenza.

INFLUENZA CHEMOPROPHYLAXIS RECOMMENDATIONS

1. Oseltamivir is the preferred antiviral chemoprophylaxis for patients with influenza A and B.
2. Optimally, postexposure chemoprophylaxis should only be used when antiviral agents can be initiated within 48 hours of exposure.
3. Antiviral chemoprophylaxis is recommended after known or suspected influenza exposure in the following situations:
   - Any child at high risk for influenza complications for whom influenza vaccine is contraindicated or has not yet been administered this season
   - Any child at high risk for influenza complications who received influenza vaccine in the past 2 weeks (ie, optimal immunity may not yet be achieved)
   - Any child at high risk for influenza complications who has been vaccinated but may not have mounted a sufficient immune response (ie, because of immunosuppression)
   - Any child at high risk for influenza complications when influenza virus strains circulating in the community are not well matched with those of the seasonal influenza vaccine per the Centers for Disease Control and Prevention (https://www.cdc.gov/flu/vaccines-work/effectiveness-studies.htm)
   - Family members and close contacts of children at high risk for influenza complications, including health care personnel, when influenza virus strains circulating in the community are not well matched with those of the seasonal influenza vaccine per the Centers for Disease Control and Prevention
   - Family members and close contacts who are unvaccinated and are likely to have ongoing, close exposure to:
     - o unvaccinated children at high risk for influenza complications; or
     - o unvaccinated children who are younger than 24 months.
   - Family members and close contacts who are at high risk for influenza complications
   - Unvaccinated staff and children in a closed institutional setting with children at high risk for influenza complications (eg, extended-care facilities), to control influenza outbreaks

STAFF

Jennifer M. Frantz, MPH
Gillian Gibbs, MPH

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ABBREVIATIONS

AAP: American Academy of Pediatrics
COVID-19: coronavirus disease 2019
IIV: inactivated influenza vaccine
LAIV: live attenuated influenza vaccine
SOT: solid organ transplant
RIV: recombinant influenza vaccine

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