CDC Pediatric and Adolescent Immunization Update

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Outline

- **Child and Adolescent Immunization Schedule**
- **Presumptive Approach**
- **Vaccine Recommendations**
  - COVID-19
  - Influenza
  - Polio
  - DTaP/Tdap
  - Meningitis
  - Pneumococcal
  - HPV

2022 Child and Adolescent Immunization Schedule

Child and Adolescent Schedule

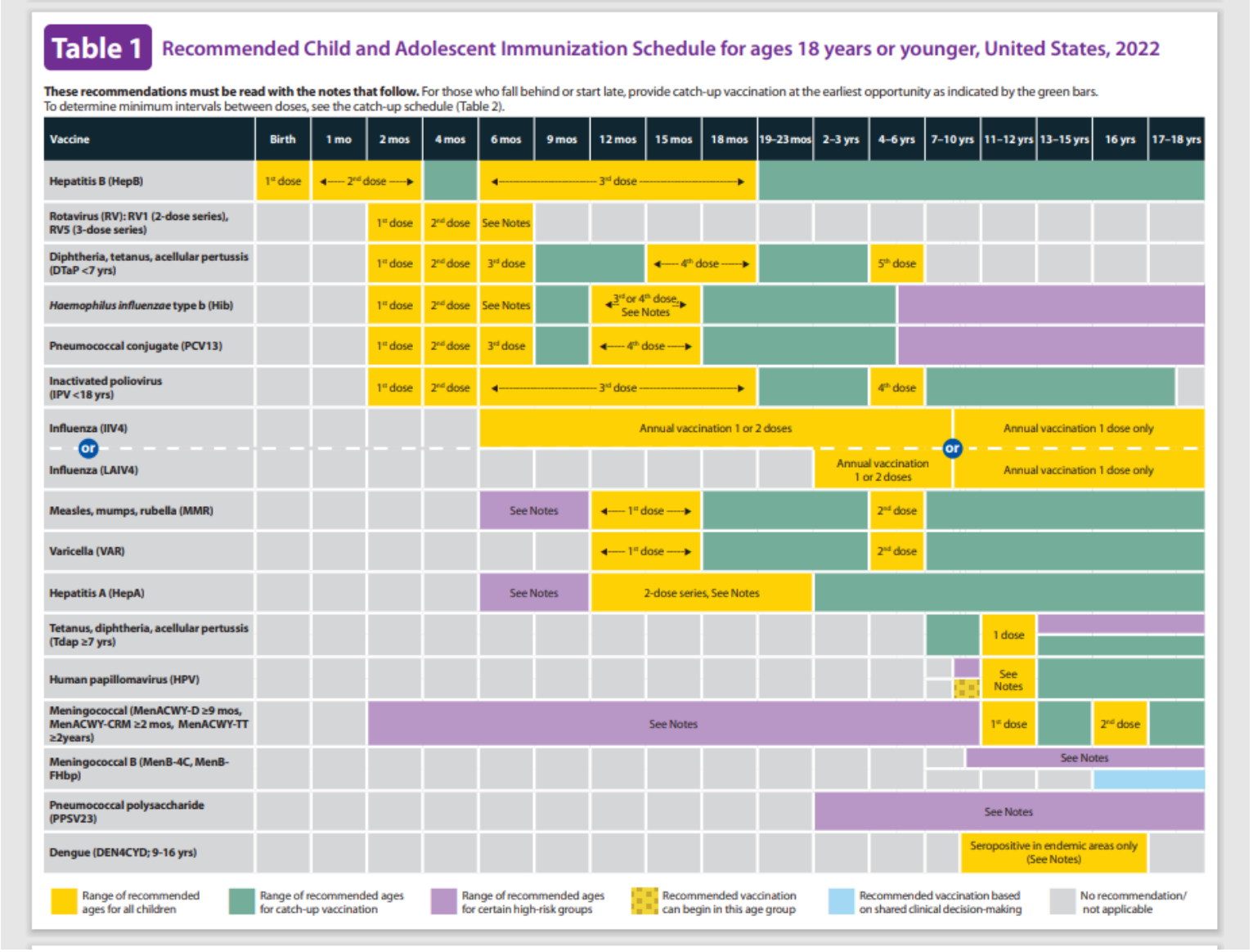


Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2022

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.
To determine minimum intervals between doses, see the catch-up schedule (Table 2).

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs
Hepatitis B (HepB)	1st dose	◄— 2nd dose —►			◄— 3rd dose —►												
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1st dose	2nd dose	See Notes												
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1st dose	2nd dose	3rd dose			◄— 4th dose —►				5th dose					
Haemophilus influenzae type b (Hib)			1st dose	2nd dose	See Notes		◄— 3rd or 4th dose, See Notes —►										
Pneumococcal conjugate (PCV13)			1st dose	2nd dose	3rd dose		◄— 4th dose —►										
Inactivated poliovirus (IPV <18 yrs)			1st dose	2nd dose	◄— 3rd dose —►							4th dose					
Influenza (IIV4)					Annual vaccination 1 or 2 doses								Annual vaccination 1 dose only				
or											or		or				
Influenza (LAIV4)											Annual vaccination 1 or 2 doses		Annual vaccination 1 dose only				
Measles, mumps, rubella (MMR)					See Notes		◄— 1st dose —►					2nd dose					
Varicella (VAR)							◄— 1st dose —►					2nd dose					
Hepatitis A (HepA)					See Notes		2-dose series, See Notes										
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)														1 dose			
Human papillomavirus (HPV)														See Notes			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2years)			See Notes											1st dose		2nd dose	
Meningococcal B (MenB-4C, MenB-FHbp)														See Notes			
Pneumococcal polysaccharide (PPSV23)											See Notes						
Dengue (DEN4CYD; 9-16 yrs)														Seropositive in endemic areas only (See Notes)			

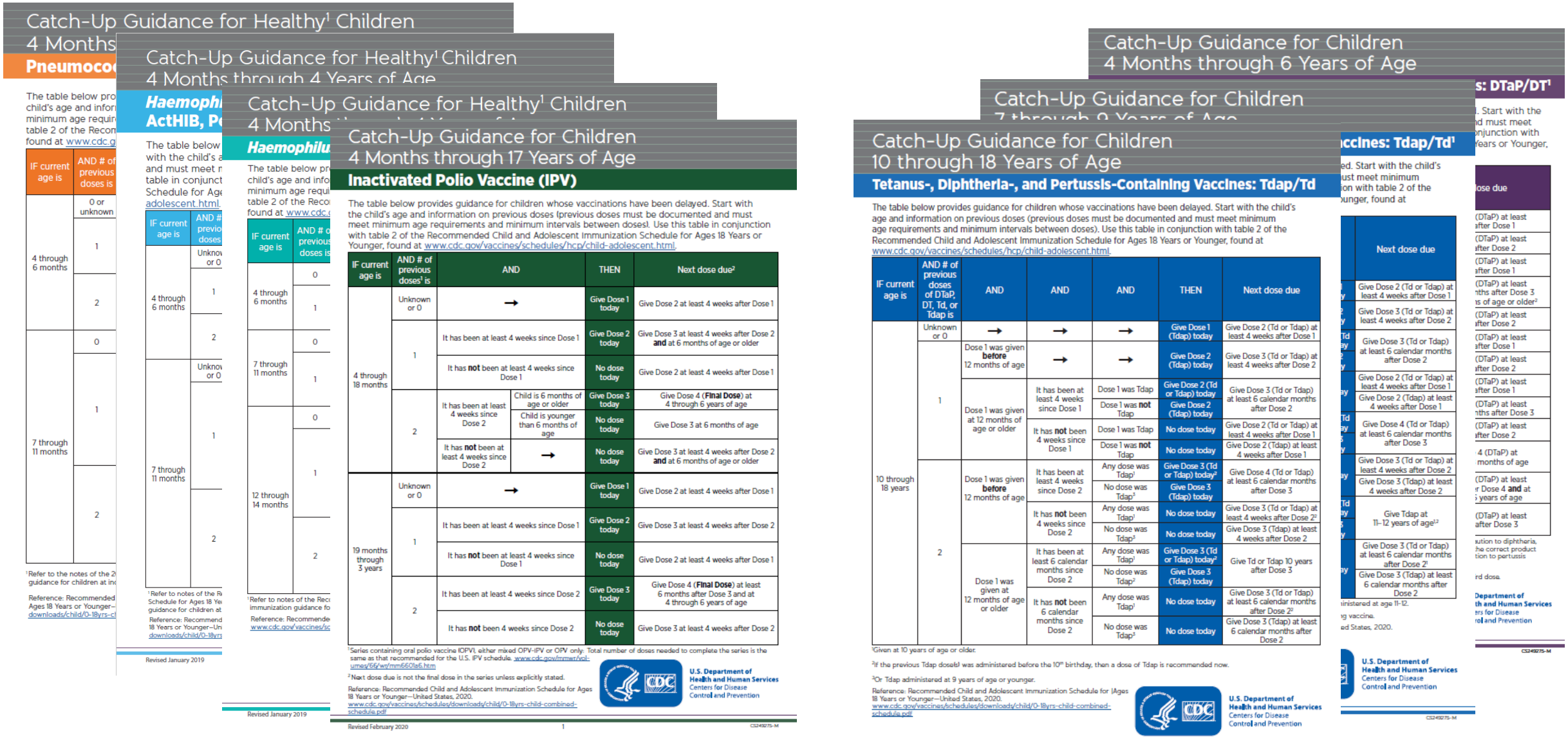
Range of recommended ages for all children
Range of recommended ages for catch-up vaccination
Range of recommended ages for certain high-risk groups
Recommended vaccination can begin in this age group
Recommended vaccination based on shared clinical decision-making
No recommendation/ not applicable

Table 2 Recommended Catch-up Immunization Schedule for Children and Adolescents Who Start Late or Who Are More than 1 Month Behind, United States, 2022

The table below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. **Always use this table in conjunction with Table 1 and the Notes that follow.**

Children age 4 months through 6 years					
Vaccine	**Minimum Age for Dose 1**	**Minimum Interval Between Doses**			
		Dose 1 to Dose 2	**Dose 2 to Dose 3**	**Dose 3 to Dose 4**	**Dose 4 to Dose 5**
Hepatitis B	Birth	**4 weeks**	**8 weeks *and* at least 16 weeks after first dose** minimum age for the final dose is 24 weeks		
Rotavirus	6 weeks Maximum age for first dose is 14 weeks, 6 days.	**4 weeks**	**4 weeks** maximum age for final dose is 8 months, 0 days		
Diphtheria, tetanus, and acellular pertussis	6 weeks	**4 weeks**	**4 weeks**	**6 months**	**6 months**
Haemophilus influenzae type b	6 weeks	**No further doses needed** if first dose was administered at age 15 months or older. **4 weeks** if first dose was administered before the 1st birthday. **8 weeks (as final dose)** if first dose was administered at age 12 through 14 months.	**No further doses needed** if previous dose was administered at age 15 months or older **4 weeks** if current age is younger than 12 months ***and*** first dose was administered at younger than age 7 months ***and*** at least 1 previous dose was PRP-T (ActHib®, Pentacel®, Hiberix®), Vaxelis® or unknown **8 weeks *and* age 12 through 59 months (as final dose)** if current age is younger than 12 months ***and*** first dose was administered at age 7 through 11 months; OR if current age is 12 through 59 months ***and*** first dose was administered before the 1st birthday ***and*** second dose was administered at younger than 15 months; OR if both doses were PedvaxHIB® and were administered before the 1st birthday	**8 weeks (as final dose)** This dose only necessary for children age 12 through 59 months who received 3 doses before the 1st birthday.	
Pneumococcal conjugate	6 weeks	**No further doses needed** for healthy children if first dose was administered at age 24 months or older **4 weeks** if first dose was administered before the 1st birthday **8 weeks (as final dose for healthy children)** if first dose was administered at the 1st birthday or after	**No further doses needed** for healthy children if previous dose was administered at age 24 months or older **4 weeks** if current age is younger than 12 months and previous dose was administered at <7 months old **8 weeks (as final dose for healthy children)** if previous dose was administered between 7–11 months (wait until at least 12 months old); OR if current age is 12 months or older and at least 1 dose was administered before age 12 months	**8 weeks (as final dose)** This dose only necessary for children age 12 through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age.	
Inactivated poliovirus	6 weeks	**4 weeks**	**4 weeks** if current age is <4 years **6 months (as final dose)** if current age is 4 years or older	**6 months (minimum age 4 years for final dose)**	
Measles, mumps, rubella	12 months	**4 weeks**			
Varicella	12 months	**3 months**			
Hepatitis A	12 months	**6 months**			
Meningococcal ACWY	2 months MenACWY-CRM 9 months MenACWY-D 2 years MenACWY-TT	**8 weeks**	See Notes	See Notes	
Children and adolescents age 7 through 18 years					
Meningococcal ACWY	Not applicable (N/A)	**8 weeks**			
Tetanus, diphtheria; tetanus, diphtheria, and acellular pertussis	7 years	**4 weeks**	**4 weeks** if first dose of DTaP/DT was administered before the 1st birthday **6 months (as final dose)** if first dose of DTaP/DT or Tdap/Td was administered at or after the 1st birthday	**6 months** if first dose of DTaP/DT was administered before the 1st birthday	
Human papillomavirus	9 years	**Routine dosing intervals are recommended.**			
Hepatitis A	N/A	**6 months**			
Hepatitis B	N/A	**4 weeks**	**8 weeks *and* at least 16 weeks after first dose**		
Inactivated poliovirus	N/A	**4 weeks**	**6 months** A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.	A fourth dose of IPV is indicated if all previous doses were administered at <4 years or if the third dose was administered <6 months after the second dose.	
Measles, mumps, rubella	N/A	**4 weeks**			
Varicella	N/A	**3 months** if younger than age 13 years. **4 weeks** if age 13 years or older			
Dengue	9 years	**6 months**	6 months		

CDC Resources for Healthcare Providers: Job Aids



www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html

Presumptive Approach

Vaccine Communication

- **Health care providers play key role in establishing and maintaining a practice-wide commitment to communicating effectively about vaccines**
  - Important for maintaining high vaccination coverage

Conventional Wisdom

- **Improve parents' knowledge and they will make the right decision**
- **This educational approach assumes human decision-making is rational-but this is often not true**
- **Behavioral economics: human behavior is influenced by deep-seated cognitive biases and heuristics resistant to rational influence**

O'Leary, S. Strategies for Talking to Vaccine-Hesitant Parents. *NFID Clinical Vaccinology Course,* Mar 2017

What Does This Mean?

- **Becoming increasingly clear that simply correcting knowledge gaps is not enough to address parents' concerns about vaccines**

- **Investigators develop interventions to improve vaccination uptake focused on how people actually think rather than how they ought to think**
  - Remember-correcting misconceptions can successfully reduce misconceptions but does not always result in vaccination

O'Leary, S. Strategies for Talking to Vaccine-Hesitant Parents. *NFID Clinical Vaccinology Course,* Mar 2017

Strong Vaccine Recommendation

- **Recommendation from a health care provider remains the number one reason parents decide to vaccinate**
  - A parent who receives a recommendation from their child's health care provider is 4-5x more likely to get the HPV vaccine for their child

Trust is the Foundation for Vaccine Conversations

- **93% of parents say their child's provider is most trusted source of vaccine information**
- **Trust in the provider shown to positively or negatively affect vaccine acceptance**
- **Building trust early is important:**
  - Satisfaction in parents of young infants associated with improved vaccine uptake

CDC National Poll of Parents (2018); Salmon DA, et. al. Arch Pediatr Adolesc Med 2005; 159(5): 470-6; Benin AL, et. al. Pediatrics 2006; 117(5): 1532-41; Glanz JM, et. al. Acad Pediatr 2013; 13(5): 481-8; Larson HJ, et. al. Hum Vaccin Immunother 2018; 14(7): 1599-609; Fiscella K, et. al. Med Care 2004; 42(11): 1049-55; Thom DH, et. al. J Fam Pract 2001; 50(4): 323-8; Schempf AH, et. al. Arch Pediatr Adolesc Med 2007; 161(1): 50-6.

Start Conversations Early

- **Use every opportunity to reach parents before the first vaccine visit**
- **Most people make vaccine decisions for their child before or during pregnancy**
  - Parents who refuse vaccines more likely to start thinking about them before child's birth
- **Pregnant people want more information on vaccines from a pediatric provider**
  - With limited opportunities, frequently turn to the internet, media, or word of mouth

Glanz JM, et. al. Acad Pediatr 2013; 13(5): 481-8; Corben P, et. al. BMC Public Health 2018; 18(1): 566. Danchin MH, et. al. Vaccine 2018; 36(44): 6473-9. Weiner JL, et. al. Am J Prev Med 2015; 49(6 Suppl 4): S426-34. Wroe AL, et. al. Health Psychol 2004; 23(1): 33-41; Rosso A, et. al. Hum Vaccin Immunother 2020: 1-12. Vannice KS, et. al. Pediatrics 2011; 127 Suppl 1: S120-6.

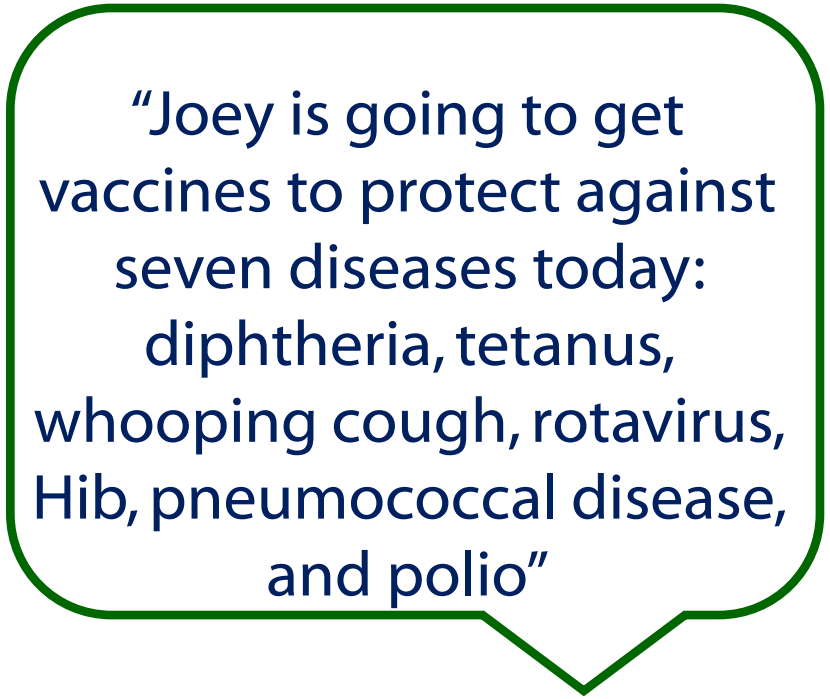
Initiating the Conversation: Give a Strong Recommendation Using a Presumptive Approach

- Presumptive: Assumes parents will choose to vaccinate
- Participatory: Presents parents with a decision to make

Initiating the Conversation: Give a Strong Recommendation Using a Presumptive Approach

Participatory approach

Initiating the Conversation: Give a Strong Recommendation Using a Presumptive Approach



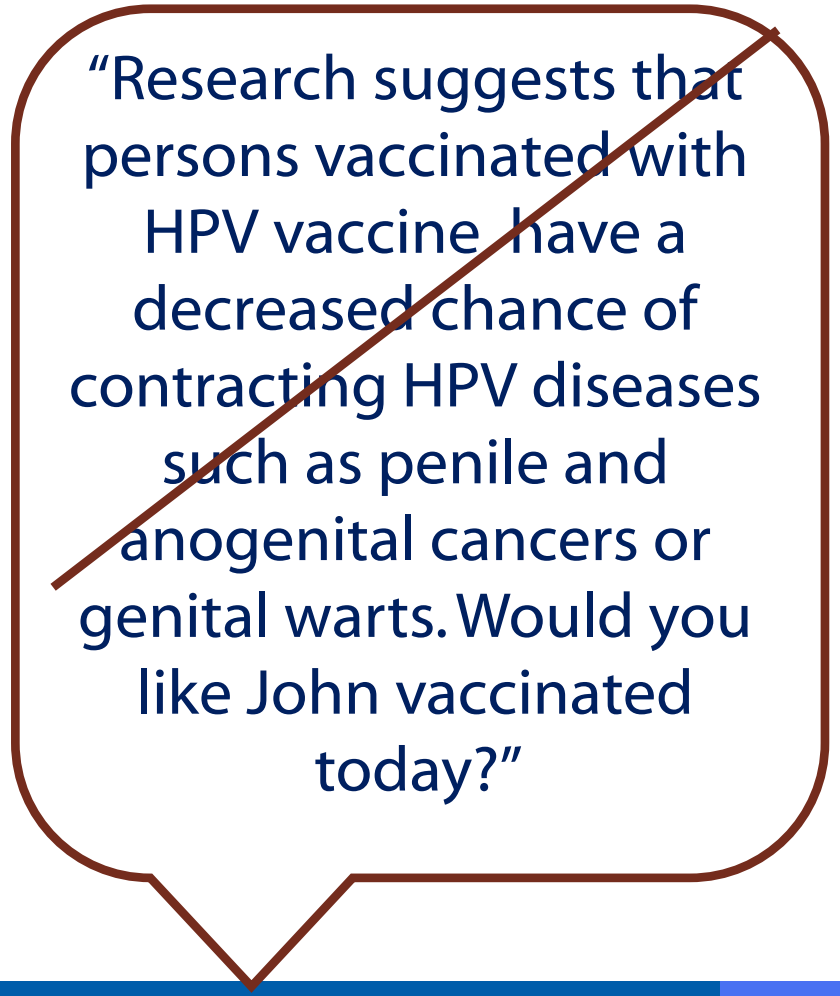
Presumptive approach

What You Say Matters AND How You Say It Matters

- **Good recommendation**

☑ Simple
☑ Strong
☑ Personalized

What You Say Matters AND How You Say It Matters



What You Say Matters AND How You Say It Matters

"It's time to start the HPV series. I recommend John be is vaccinated today. I vaccinated my children. It's the healthy thing to do."

Why Presumptive Style Might Be Better

- Most patients perceive decisions about vaccination to be complicated
- As humans, when we make decisions we perceive to be complicated, we tend to have a status quo bias (also called a "default bias"), meaning we go with what is expected or "normal"
- Using a presumptive approach, patients are made to feel that vaccination is what most people do, and it is the socially acceptable "norm"

O'Leary, S. Strategies for Talking to Vaccine-Hesitant Parents. *NFID Clinical Vaccinology Course,* Mar 2017

Why Use the Presumptive Approach?

- 3 to 5-fold more effective than participatory approach, even after adjusting for baseline parental hesitancy
- Among parents who resist after a presumptive recommendation, approximately half accept vaccines when the provider pursues their initial recommendation
- Presumptive approach associated with greater parental perceived urgency for vaccination and trust in the information received from the provider

Dempsey AF, et. al. Vaccine 2019; 37(10): 1307-12; Hofstetter AM, et. al. Vaccine 2017; 35(20): 2709-15; Opel DJ, et al. Pediatrics 2013; 132(6): 1037-46; Opel DJ, et al. Am J Public Health 2015; 105(10): 1998-2004; Sturm L, et. al. J Adolesc Health 2017; 61(2): 246-51.

What if Parents Have Questions?

- **Even parents who accept vaccines often have questions or concerns, and are simply looking for additional information or reassurance**
- **When responding to parents' questions or concerns, share:**
  - Personal stories
  - Balanced information on risks and benefits
  - Vaccination as the social norm
- **Share educational materials tailored to their questions**

"My aunt had cervical cancer. That's why I made sure my own teenagers received the HPV vaccine"

Kennedy A, et. al. Health Aff (Millwood) 2011; 30(6): 1151-9; Gust DA, et. al. Pediatrics 2008; 122(4): 718-25; Shelby A, et. al. Hum Vaccin Immunother 2013; 9(8): 1795-801; Kempe A, et. al. Am J Prev Med 2011; 40(5): 548-55; Betsch C, et. al. Health Psychol 2013; 32(2): 146-55. Image credit: CDC

COVID-19

General Recommendations

- **COVID-19 primary series vaccination is recommended for everyone ages 6 months and older in the United States for the prevention of COVID-19.**
  - This includes people both with and without underlying medical conditions.

- **Moderna, Novavax, and Pfizer-BioNTech COVID-19 vaccines are recommended.**

COVID-19 Immunization Schedule for Most People

People ages 6 months–4 years

Moderna

Primary → (4-8 weeks) → Primary

---or---

Pfizer-BioNTech

Primary → (3-8 weeks) → Primary → (At least 8 weeks) → Primary

COVID-19 Immunization Schedule for Most People

People ages 5–11 years

Moderna

Primary → (4-8 weeks) → Primary

---or---

Pfizer-BioNTech

Primary → (3-8 weeks) → Primary → (At least 5 months) → Monovalent Booster

COVID-19 Immunization Schedule for Most People

People ages 12 –17 years

Moderna

Primary → (4-8 weeks*) → Primary → (At least 2 months) → Bivalent Booster†

---or---

Novavax or Pfizer-BioNTech

Primary → (3-8 weeks*) → Primary → (At least 2 months) → Bivalent Booster†

Regardless of previous monovalent booster doses given

*3-8 week interval for Novavax and Pfizer-BioNTech; 4-8 week interval for Moderna

†The bivalent booster dose is administered at least 2 months after completion of the primary series. For people who previously received a monovalent booster dose(s), the bivalent booster dose is administered at least 2 months after the last monovalent booster dose.

COVID-19 Immunization Schedule for People who are Moderately or Severely Immunocompromised

People ages 6 months–4 years

Moderna

Primary → (4 weeks) → Primary → (At least 4 weeks) → Primary

---or---

Pfizer-BioNTech

Primary → (3 weeks) → Primary → (At least 8 weeks) → Primary

COVID-19 Immunization Schedule for People who are Moderately or Severely Immunocompromised

People ages 5–11 years

Moderna

Primary → (4 weeks) → Primary → (At least 4 weeks) → Primary

---or---

Pfizer-BioNTech

Primary → (3 weeks) → Primary → (At least 4 weeks) → Primary → (At least 5 months) → Monovalent Booster

COVID-19 Immunization Schedule for People who are Moderately or Severely Immunocompromised

People ages 12–17 years

Moderna

Primary → (4 weeks) → Primary → (At least 4 weeks) → Primary → (At least 2 months) → Bivalent Booster†

Regardless of previous monovalent booster doses given

---or---

Pfizer-BioNTech

Primary → (3 weeks) → Primary → (At least 4 weeks) → Primary → (At least 2 months) → Bivalent Booster†

Regardless of previous monovalent booster doses given

---or---

Novavax

Primary → (3 weeks) → Primary → (At least 2 months) → Bivalent Booster†

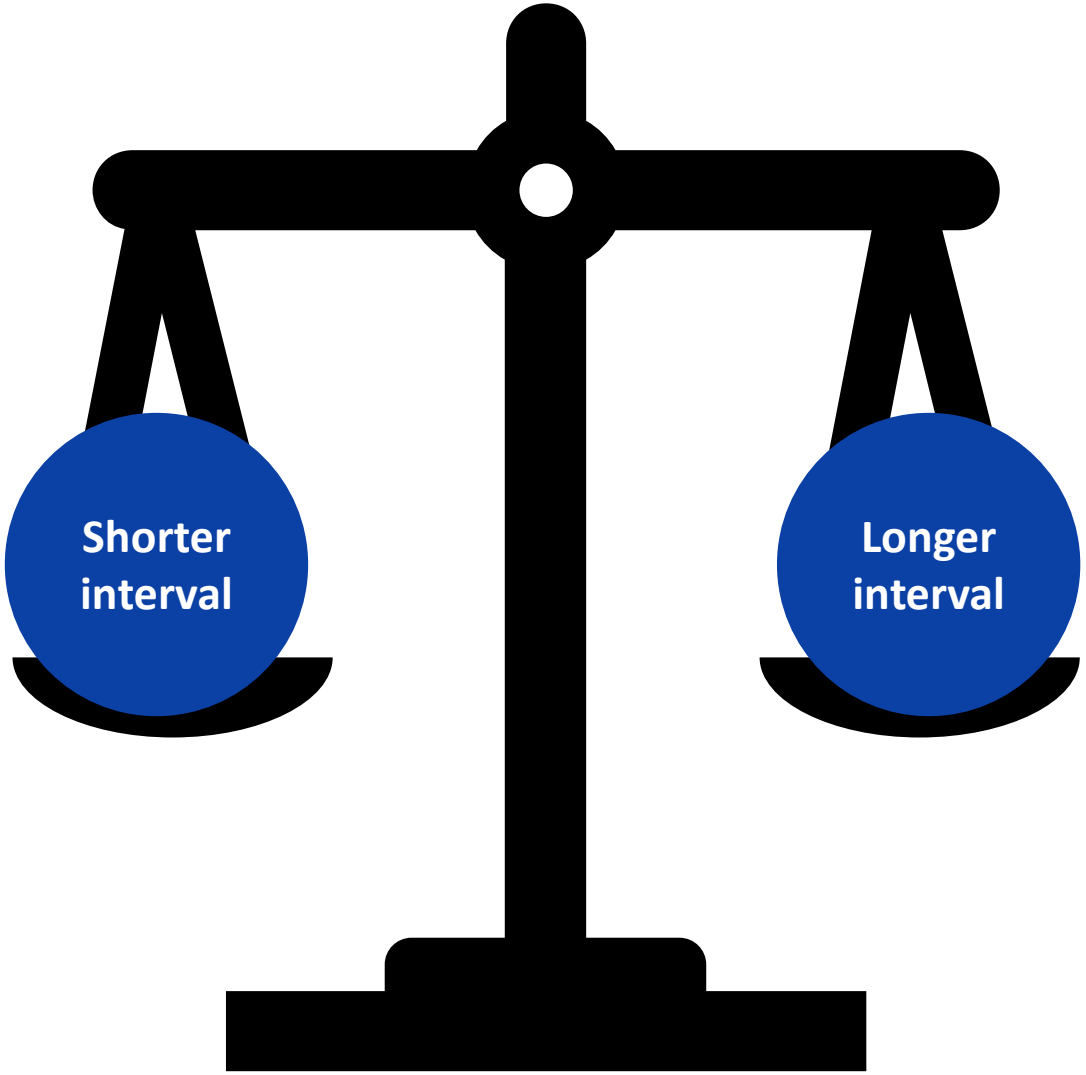
Regardless of previous monovalent booster doses given

†The bivalent booster dose is administered at least 2 months after completion of the primary series. For people who previously received a monovalent booster dose(s), the bivalent booster dose is administered at least 2 months after the last monovalent booster dose.

People who are Immunocompromised

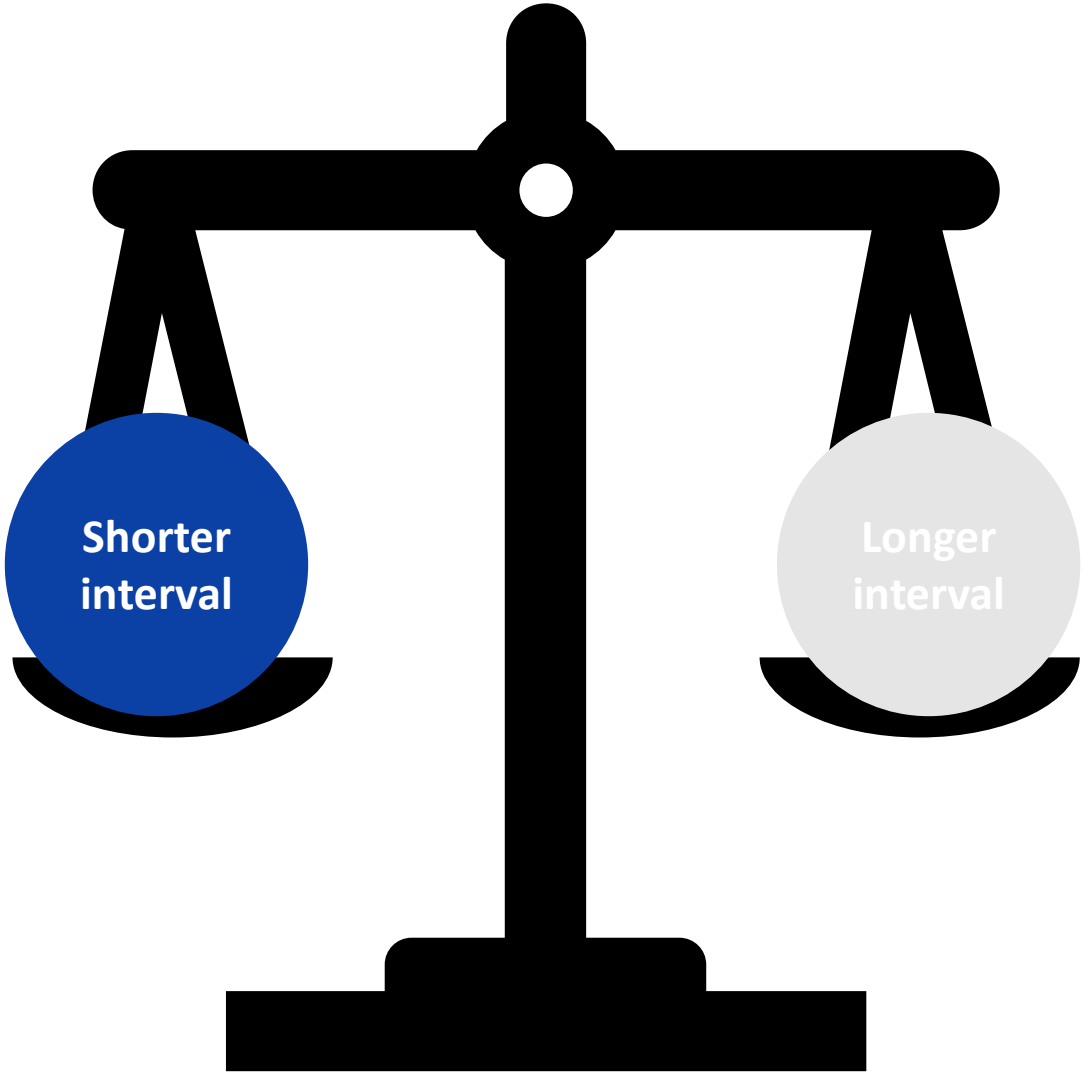
- People can self-attest to their moderately or severely immunocompromised status and receive COVID-19 vaccine doses wherever vaccines are offered. Vaccinators should not deny COVID-19 vaccination to a person due to lack of documentation.

Considerations for an Extended Primary Series Interval



Considerations for an Extended Primary Series Interval

- Immunocompromised
- High risk for severe disease
- Household members with high risk for severe disease
- High COVID-19 community levels



- Reduced myocarditis risk
- Adolescent and young adult males
- Optimize vaccine effectiveness

Considerations for an Extended Primary Series Interval

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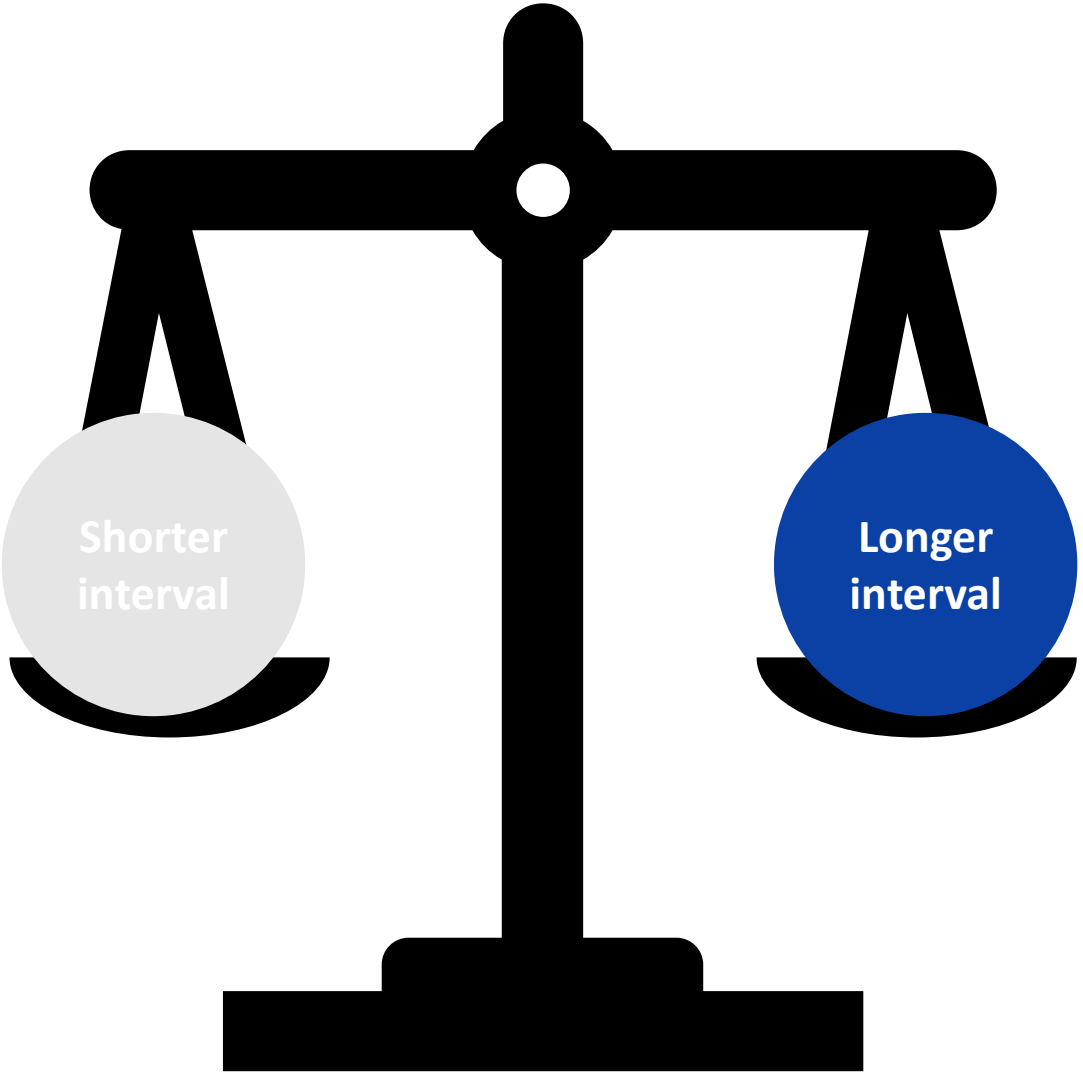


- Reduced myocarditis risk
- Adolescent and young adult males
- Optimize vaccine effectiveness

People with Prior or Current SARS-CoV-2

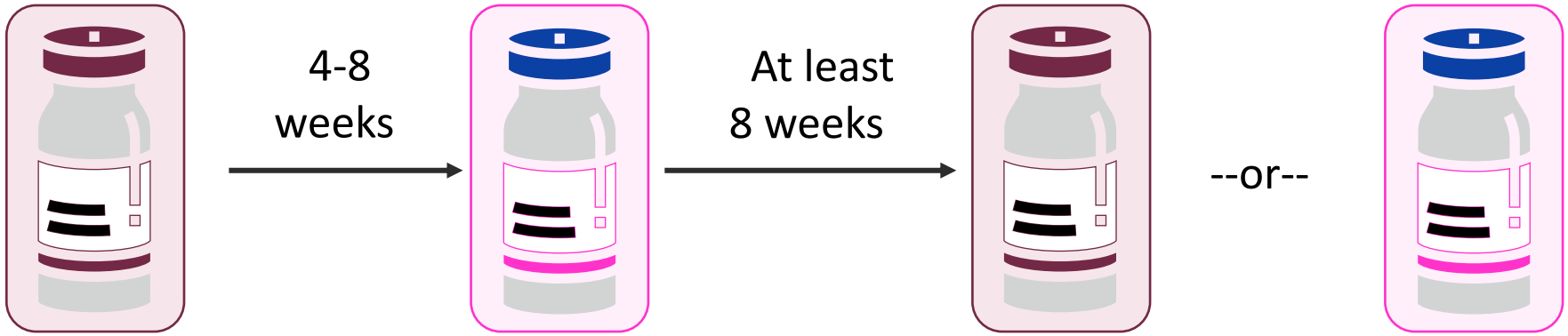
- Defer any COVID-19 vaccination, including bivalent booster vaccination, at least until recovery from the acute illness (if symptoms were present) and criteria to discontinue isolation have been met.
- In addition, people who recently had SARS-CoV-2 infection may consider delaying a primary series dose or their first or second COVID-19 vaccine booster dose by 3 months from symptom onset or positive test (if infection was asymptomatic).
- Individual factors such as risk of COVID-19 severe disease, COVID-19 community level, or characteristics of the predominant SARS-CoV-2 strain should be taken into account when determining whether to delay getting a COVID-19 vaccination after infection.

Interchangeability

- **COVID-19 vaccines are not interchangeable.**
- **The same vaccine product should be used for all doses of the primary series.**
- **In the following exceptional situations, a different, age-appropriate COVID-19 vaccine may be administered to complete a primary series at a minimum interval of 28 days from the last dose.**
  - The same vaccine is not available
  - The first dose is unknown
  - A person starts but is unable to complete a primary series with the same COVID-19 vaccine due to a contraindication

Mixed Series For Children Ages 6 Months–4 Years

- **Children ages 6 months–4 years who receive different mRNA products for the first 2 doses of an mRNA COVID-19 vaccine series should receive a third dose of either mRNA vaccine 8 weeks after the second dose to complete the 3-dose primary series.**



Dose 1:
0.20 mL (3mcg) of the Pfizer-BioNTech product for ages 6 months through 4 years

Dose 2:
0.25 mL (25mcg) of the Moderna product for ages 6 months through 5 years

Dose 3:
0.20 mL (3mcg) of the Pfizer-BioNTech product for ages 6 months through 4 years
--or--
0.25 mL (25mcg) of the Moderna product for ages 6 months through 5 years

Co-Administration

- Routine administration of all age-appropriate doses of vaccines simultaneously is recommended as best practice for people for whom no specific contraindications exist at the time of the healthcare visit.

- Extensive experience with non-COVID 19 vaccines has demonstrated that immunogenicity and adverse event profiles are generally similar when vaccines are administered simultaneously as when they are administered alone.

- Providers should offer all vaccines for which a person is eligible.

COVID-19 Vaccines: Moderna

Product	 Product for ages 6 months–5 years	 Product for ages 6 years–11 years	 Product for ages 18 years and older	 Product for ages 12 years and older
Authorized dose type	Primary	Primary	Booster	Primary
Vial cap color	Dark blue	Dark blue	Dark Blue	Red
Label border color	Magenta	Purple	Gray	Light blue
Composition	Monovalent	Monovalent	Bivalent	Monovalent
Dose (mRNA concentration)	25 mcg	50 mcg	50 mcg	100 mcg
Injection volume	0.25 mL	0.5 mL	0.5 mL	0.5 mL
Dilution required	No	No	No	No

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Injection volume	0.25 mL	0.5 mL	0.5 mL	0.5 mL
Dilution required	No	No	No	No

COVID-19 Vaccines: Pfizer-BioNTech

Product	 Product for ages 6 months–4 years	 Product for ages 5–11 years	 Product for ages 12 years and older (monovalent)	 Product for ages 12 years and older (bivalent)
Authorized dose type	Primary	Primary and booster	Primary	Booster
Vial cap color/label border color	Maroon	Orange	Gray	Gray
Composition	Monovalent	Monovalent	Monovalent	Bivalent
Dose (mRNA concentration)	3 mcg	10 mcg	30 mcg	30 mcg
Injection volume	0.2 mL	0.2 mL	0.3 mL	0.3 mL
Dilution required	Yes—2.2 mL	Yes—1.3 mL	No	No

COVID-19 Vaccines: Pfizer-BioNTech

Product	 **Product for ages 6 months–4 years**	Product for ages 5–11 years	Product for ages 12 years and older (monovalent)	Product for ages 12 years and older (bivalent)
Authorized dose type	Primary	Primary and booster	Primary	Booster
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Injection volume	0.2 mL	0.2 mL	0.3 mL	0.3 mL
Dilution required	Yes—2.2 mL	Yes—1.3 mL	No	No

COVID-19 Vaccines: Pfizer-BioNTech

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COVID-19 Vaccines: Pfizer-BioNTech

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COVID-19 Vaccines: Pfizer-BioNTech

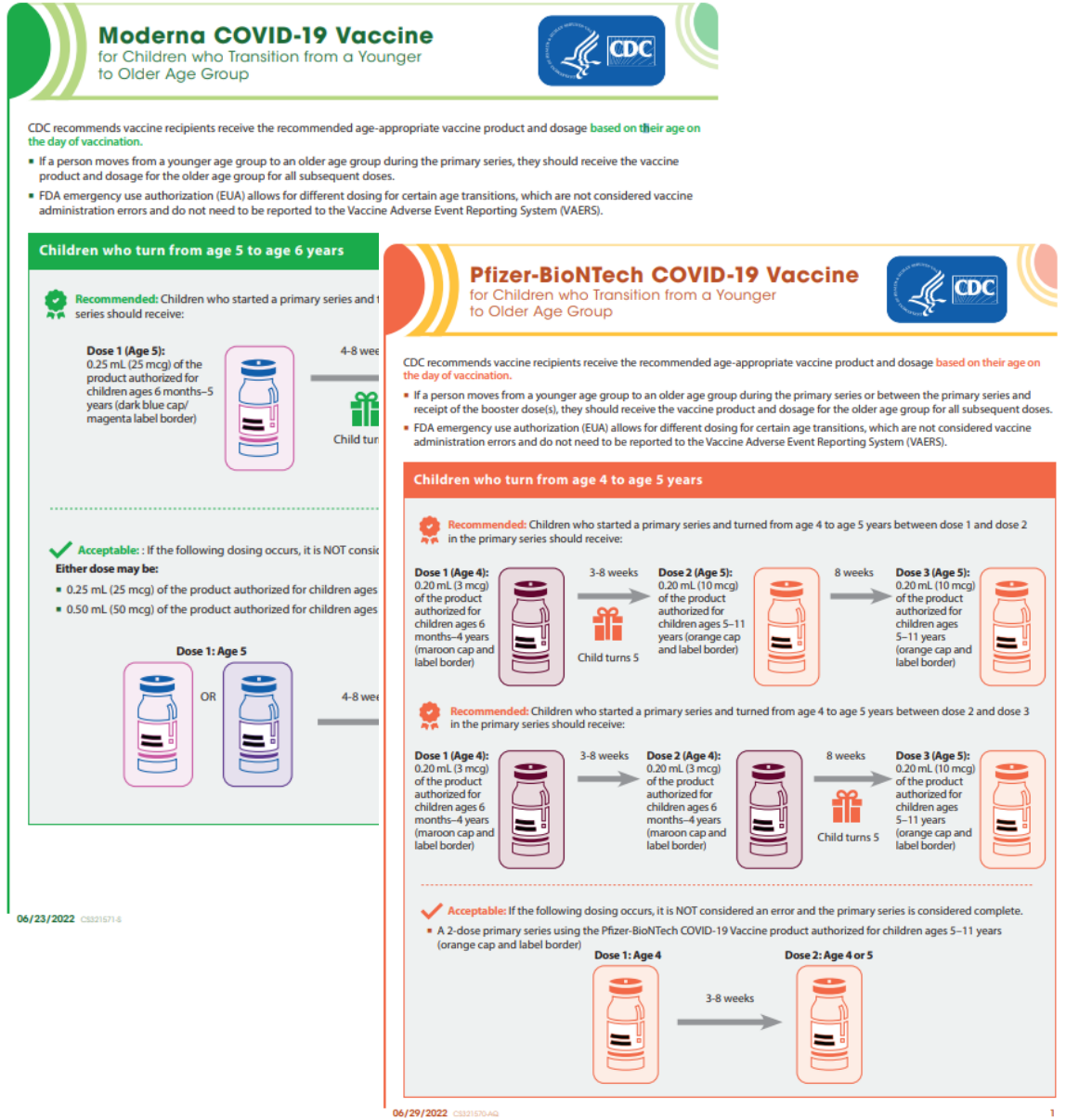
Product	Product for ages 6 months–4 years	Product for ages 5–11 years	 Product for ages 12 years and older (monovalent)	 Product for ages 12 years and older (bivalent)
Authorized dose type	Primary	Primary and booster	Primary	Booster
Vial cap color/label border color	Maroon	Orange	Gray	Gray
Composition	Monovalent	Monovalent	Monovalent	Bivalent
Dose (mRNA concentration)	3 mcg	10 mcg	30 mcg	30 mcg
Injection volume	0.2 mL	0.2 mL	0.3 mL	0.3 mL
Dilution required	Yes—2.2 mL	Yes—1.3 mL	No	No

Vaccine Dosage

- CDC recommends that everyone should receive the age-appropriate vaccine product and follow the schedule based on their age on the day of vaccination, regardless of their size or weight.
- If a person moves from a younger age group to an older age group during the primary series or between the primary series and receipt of the booster dose(s), they should receive the vaccine dosage for the older age group for all subsequent doses.

Vaccine Dosage

- FDA emergency use authorization (EUA) allows for different dosing for certain age transitions, which are not considered vaccine administration errors and do not need to be reported to the Vaccine Adverse Event Reporting System (VAERS)
- https://www.cdc.gov/vaccines/covid-19/downloads/Moderna-Child-Age-Transition-508.pdf
- https://www.cdc.gov/vaccines/covid-19/downloads/Pfizer-Child-Age-Transition-508.pdf



Moderna COVID-19 Vaccine
for Children who Transition from a Younger to Older Age Group

CDC recommends vaccine recipients receive the recommended age-appropriate vaccine product and dosage based on their age on the day of vaccination.

- If a person moves from a younger age group to an older age group during the primary series, they should receive the vaccine product and dosage for the older age group for all subsequent doses.
- FDA emergency use authorization (EUA) allows for different dosing for certain age transitions, which are not considered vaccine administration errors and do not need to be reported to the Vaccine Adverse Event Reporting System (VAERS).

Children who turn from age 5 to age 6 years

Recommended: Children who started a primary series and
series should receive:

Dose 1 (Age 5):
0.25 mL (25 mcg) of the product authorized for children ages 6 months–5 years (dark blue cap/ magenta label border)

4-8 wee

Child tur

Acceptable: : If the following dosing occurs, it is NOT consi
Either dose may be:
- 0.25 mL (25 mcg) of the product authorized for children ages
- 0.50 mL (50 mcg) of the product authorized for children ages

Dose 1: Age 5

OR

4-8 wee

06/23/2022 CS321571-B

Pfizer-BioNTech COVID-19 Vaccine
for Children who Transition from a Younger to Older Age Group

CDC recommends vaccine recipients receive the recommended age-appropriate vaccine product and dosage based on their age on the day of vaccination.

- If a person moves from a younger age group to an older age group during the primary series or between the primary series and receipt of the booster dose(s), they should receive the vaccine product and dosage for the older age group for all subsequent doses.
- FDA emergency use authorization (EUA) allows for different dosing for certain age transitions, which are not considered vaccine administration errors and do not need to be reported to the Vaccine Adverse Event Reporting System (VAERS).

Children who turn from age 4 to age 5 years

Recommended: Children who started a primary series and turned from age 4 to age 5 years between dose 1 and dose 2 in the primary series should receive:

Dose 1 (Age 4):
0.20 mL (3 mcg) of the product authorized for children ages 6 months–4 years (maroon cap and label border)

3-8 weeks

Child turns 5

Dose 2 (Age 5):
0.20 mL (10 mcg) of the product authorized for children ages 5–11 years (orange cap and label border)

8 weeks

Dose 3 (Age 5):
0.20 mL (10 mcg) of the product authorized for children ages 5–11 years (orange cap and label border)

Recommended: Children who started a primary series and turned from age 4 to age 5 years between dose 2 and dose 3 in the primary series should receive:

Dose 1 (Age 4):
0.20 mL (3 mcg) of the product authorized for children ages 6 months–4 years (maroon cap and label border)

3-8 weeks

Dose 2 (Age 4):
0.20 mL (3 mcg) of the product authorized for children ages 6 months–4 years (maroon cap and label border)

8 weeks

Child turns 5

Dose 3 (Age 5):
0.20 mL (10 mcg) of the product authorized for children ages 5–11 years (orange cap and label border)

Acceptable: If the following dosing occurs, it is NOT considered an error and the primary series is considered complete.
- A 2-dose primary series using the Pfizer-BioNTech COVID-19 Vaccine product authorized for children ages 5–11 years (orange cap and label border)

Dose 1: Age 4

3-8 weeks

Dose 2: Age 4 or 5

06/29/2022 CS321570-AQ

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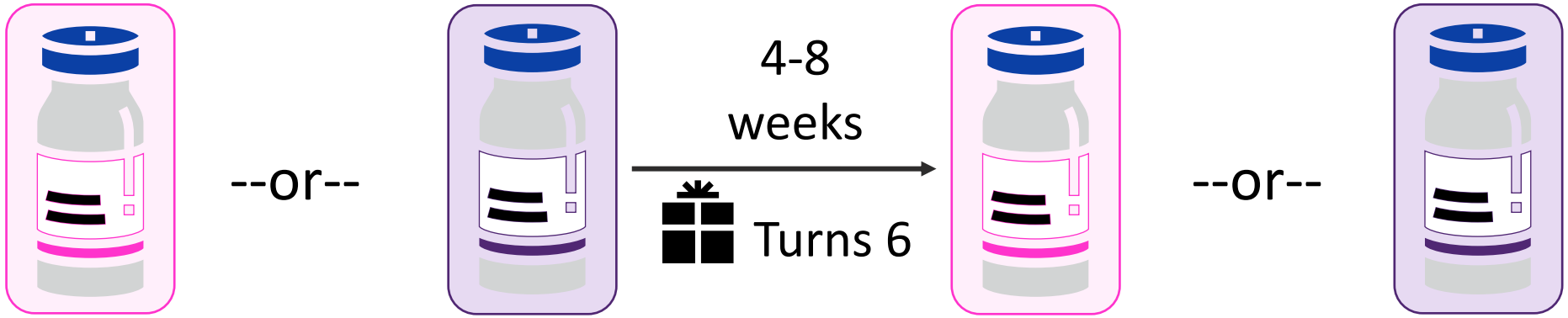
FDA Allowance for Moderna Ages 5 to 6 Years



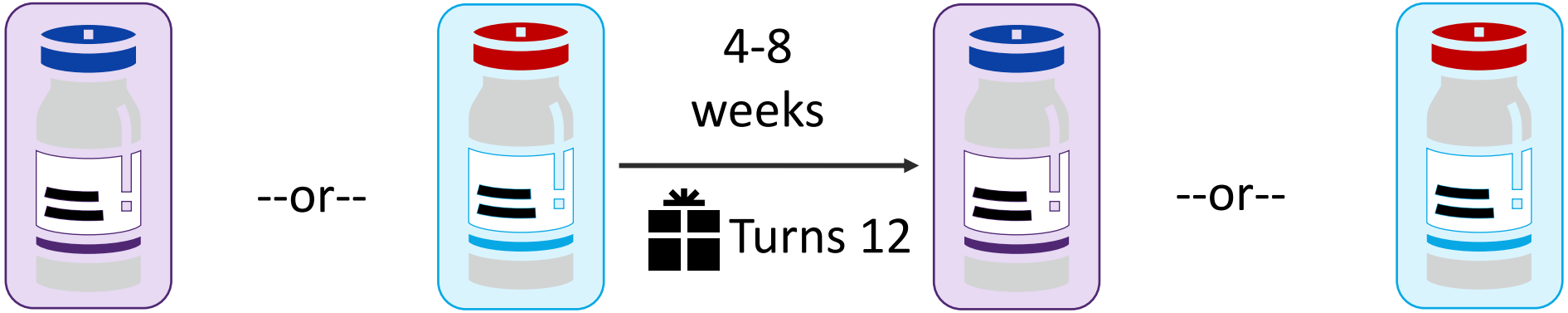
Dose 1 (Age 5):

- 0.25 mL (25 mcg) of the product for ages 6 months–5 years or
- 0.50 mL (50 mcg) of the product for ages 6–11 years

Dose 2 (Age 6):

- 0.25 mL (25 mcg) of the product for ages 6 months–5 years or
- 0.50 mL (50 mcg) of the product for ages 6–11 years

FDA Allowance for Moderna Ages 11 to 12 Years



Dose 1 (Age 11):

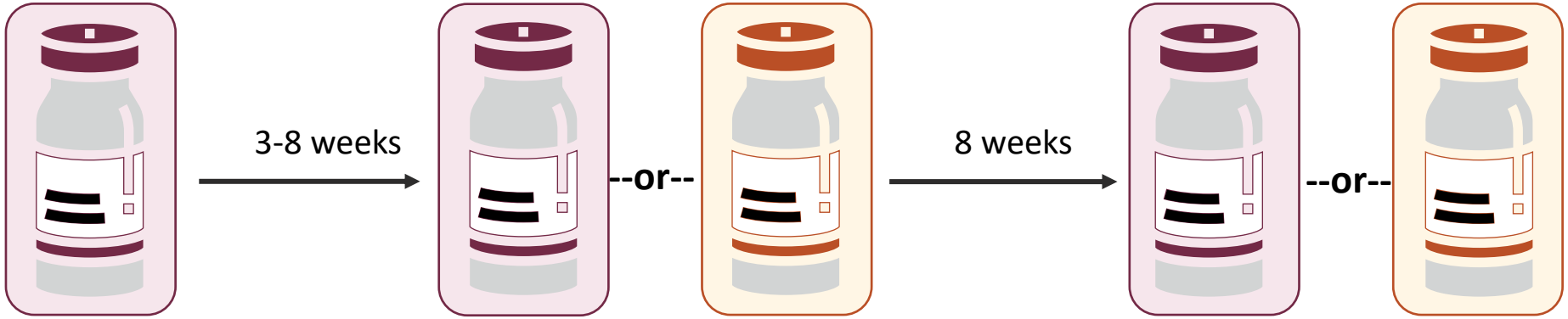
- 0.50 mL (50 mcg) of the product for ages 6–11 years
- 0.50 mL (100mcg) of the product for ages 12 years and older

Dose 2 (Age 12):

- 0.50 mL (50 mcg) of the product for ages 6–11 years
- 0.50 mL (100mcg) of the product for ages 12 years and older

FDA Allowance for Pfizer-BioNTech Ages 4 to 5 Years

Scenario 1: A 3-dose primary series initiated with the product for ages 6 months–4 years. Dose 2 and 3 may be with: the product for ages 6 months–4 years or the product for ages 5–11 years.



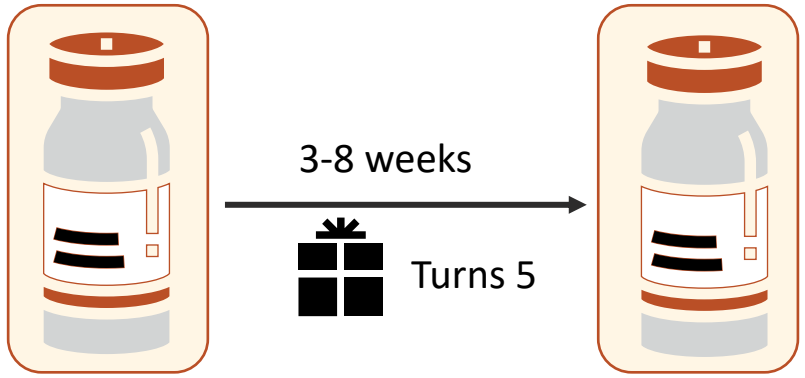
Dose 1 (Age 4):
0.2 mL (3 mcg) of the product for ages 6 months–4 years

Dose 2 (Age 4 or 5):
- 0.2 mL (3 mcg) of the product for ages 6 months–4 years, or
- 0.2 mL (10 mcg) of the product for ages 5–11 years

Dose 3 (Age 5):
- 0.2 mL (3 mcg) of the product for ages 6 months–4 years, or
- 0.2 mL (10 mcg) of the product for ages 5–11 years

FDA Allowance for Pfizer-BioNTech Age 4 to 5 Years

Scenario 2: A 2-dose primary series using the product for people ages 5–11 years (orange cap)



Dose 1 (Age 4):
0.2 mL (10 mcg) of the product for ages 5–11 years

Dose 2 (Age 5):
0.2 mL (10 mcg) of the product for ages 5–11 years

FDA Allowance for Pfizer-BioNTech Ages 4 to 5 Years

Scenario 3: A 2-dose primary series using the product for people ages 5–11 years (orange cap)

Contraindications

- History of a severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a component of the COVID-19 vaccine
- History of a known diagnosed allergy to a component of the COVID-19 vaccine
- TTS following receipt of a previous Janssen COVID-19 Vaccine (or other COVID-19 vaccines not currently authorized in the United States that are based on adenovirus vectors, e.g., AstraZeneca)

Not Recommended

- Janssen: History of an episode of an immune-mediated syndrome characterized by thrombosis and thrombocytopenia, such as spontaneous or classic HIT
- Janssen: GBS within 6 weeks after receipt of Janssen COVID-19 Vaccine

Precautions

- History of anaphylaxis to any vaccine other than COVID-19 vaccine or to any injectable therapy (i.e., intramuscular, intravenous, or subcutaneous vaccines or therapies [excluding subcutaneous immunotherapy for allergies, i.e., “allergy shots”])
- People with a history of a non-severe, immediate (onset less than 4 hours) allergic reaction after a dose of one type of COVID-19 vaccine have a precaution to the same type of COVID-19 vaccine
- People with an allergy-related contraindication to one type of COVID-19 vaccine have a precaution to the other types of COVID-19 vaccines
- Moderate or severe acute illness, with or without fever
- History of MIS-C or MIS-A
- History of myocarditis or pericarditis after a dose of an mRNA or Novavax COVID-19 vaccine
- For Janssen, history of GBS

Observation Periods

- **Providers should consider observing all patients for 15 minutes after vaccination for syncope, per the Advisory Committee on Immunization Practices' General Best Practice Guidelines.**
- **Additionally, providers should consider observing people with the following medical histories for 30 minutes to monitor for allergic reactions:**
  - An allergy-related contraindication to a different type of COVID-19 vaccine
  - Non-severe, immediate (onset within 4 hours) allergic reaction after a previous dose of COVID-19 vaccine
  - Anaphylaxis after non-COVID-19 vaccines or injectable therapies

COVID-19 Vaccine Administration Errors

- **Any preventable event that may cause or lead to inappropriate use or patient harm**
- **Safety**
  - Administration to someone younger than the authorized age
  - Shoulder Injury Related to Vaccine Administration (SIRVA)
  - Incorrect dosage (too large)
- **Efficacy**
  - Wrong site or route
  - Storage or expiration errors
  - Incorrect diluent
  - Incorrect dosage (too small)

COVID-19 Vaccine Administration Errors

Table D. Interim recommendations for COVID-19 vaccine administration errors and deviations

Type	Administration error/deviation	Interim recommendation
Site/route	• Incorrect site (i.e., site other than the deltoid muscle or vastus lateralis muscle)	• Do not repeat dose.
	• Incorrect route (e.g., subcutaneous)	• Do not repeat dose. • Inform the recipient of the potential for local and systemic adverse events.
Age	• Unauthorized age group (recipients younger than age 6 months)	• Do not give another dose at this time.*
Product and dosage	• Higher-than-authorized dose administered (e.g., incorrect dose volume, incorrect product resulting in higher-than-authorized dose)	• Do not repeat dose.†¶
	• Lower-than-authorized dose administered (e.g., leaked out of the syringe, equipment failure, recipient pulled away, incorrect product resulting in lower-than-authorized dose)	• Repeat dose immediately (no minimum interval).†§ • However, if a half-volume dose of vaccine is administered to a patient recommended for the full volume, another half-volume dose can be administered on the same clinic day, and the 2 doses can count as 1 full dose.
	• Bivalent vaccine incorrectly administered for the primary series	• Bivalent Pfizer-BioNTech vaccine: Do not repeat dose. • Bivalent Moderna vaccine: Repeat 1 monovalent dose immediately (no minimum interval)§ because administration of the booster dose will result in a lower-than-authorized dose.

https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us-appendix.html#appendix-d

Practices to Prevent Vaccine Administration Errors

Staff training

Storage

Preparation and Administration

Preventing Vaccine Administration Errors

- **Staff training practices**
  - Integrate vaccine administration training into orientation and other appropriate education requirements.
  - Provide education when new products are added to inventory or recommendations are updated.

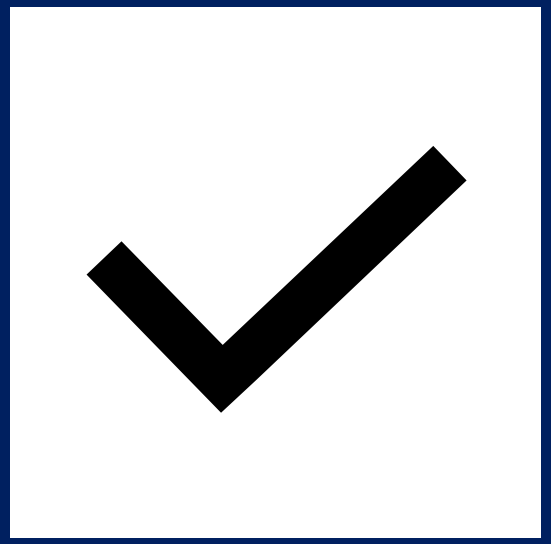
Preventing Vaccine Administration Errors

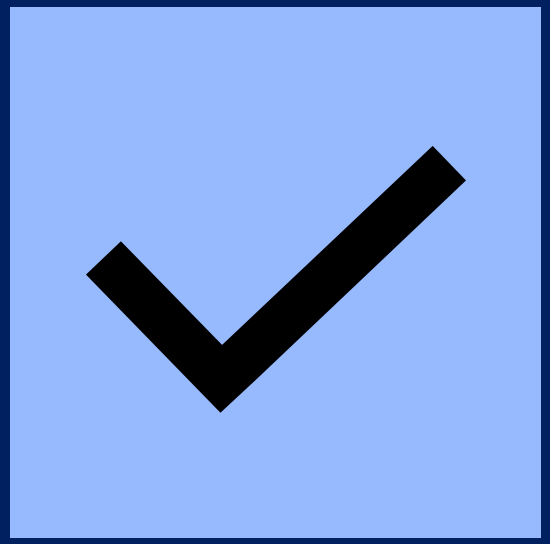
- **Storage practices**
  - Circle important information on the packaging to emphasize the difference between the vaccines.
  - Separate vaccines into bins or other containers according to type and formulation.
  - Use color-coded identification labels on vaccine storage containers.
  - Store look-alike vaccines in different areas of the storage unit.
  - Consider using "name alert" or "look-alike" stickers on packaging and areas where these vaccines are stored.

Preventing Vaccine Administration Errors

- **Preparation and administration practices**
  - Establish "Do NOT Disturb" or no-interruption areas or times when vaccines are being prepared or administered.
  - Prepare vaccine for one patient at a time. Once prepared, label the syringe with vaccine name.
  - Do not administer vaccines prepared by someone else.

Always triple-check work before administering a vaccine and ask another staff member to check.





Influenza

Abbreviations

- **IIV = Inactivated influenza vaccine**
- **RIV= Recombinant influenza vaccine**
- **LAIV = Live, attenuated influenza vaccine**
- **Prefixes:**
  - SD = standard dose
  - HD = high dose
  - a = adjuvanted
  - cc = cell-culture-based
- **Numeric suffixes (e.g., RIV3, IIV4) indicate trivalent or quadrivalent, respectively**
  - All currently-available vaccines are quadrivalent

Influenza Vaccines

- **IIV**
  - Contain inactivated virus, split or subunit
    - Standard dose or high dose
    - Unadjuvanted or adjuvanted
    - Egg- or cell-culture-based
    - Many brands, some approved for those as young as 6 months of age
    - Intramuscular (IM) administration
- **RIV**
  - Contain recombinant HA
  - Egg-free
  - IM administration
- **LAIV**
  - Live, attenuated virus
  - Attenuated (to not cause clinical illness) and cold-adapted
  - Intranasal (NAS) administration

https://www.cdc.gov/mmwr/volumes/67/wr/mm6722a5.htm?s_cid=mm6722a5_w and https://www.cdc.gov/mmwr/volumes/67/rr/pdfs/rr6703a1-H.pdf

ACIP Recommendations

- **Influenza vaccine is recommended for all eligible persons 6 months of age and older**
- **Administer the correct product based on the recipient's age and health status**
  - For example, LAIV (FluMIST) vaccine is approved for persons 2 through 49 years of age
- **All influenza vaccine is administered by intramuscular (IM) injection *except* LAIV which is administered intranasally**
- **Influenza vaccine can be administered at the same clinical visit as other vaccines**
  - Administer vaccines associated with enhanced local reactions in separate limbs, if possible

2022-2023 Updates for Pediatric Influenza Vaccination

- **Influenza vaccine composition for 2022-2023**
- **Label change from last season for Flucelvax Quadrivalent**
  - Cell-culture based inactivated influenza vaccine, or ccIIV4
- **Influenza vaccines expected to be available for children during the 2022-2023 season**

2022–2023 Influenza Vaccine Strains: HA

- **Egg-based/live vaccine**
  - A/Victoria/2570/2019 (H1N1)pdm09-like virus
  - A/Darwin/9/2021 (H3N2)-like virus
  - B/Austria/1359417/2021 (Victoria lineage)-like virus
  - B/Phuket/3073/2013 (Yamagata lineage)-like virus
- **Cell-culture/recombinant**
  - A/Wisconsin/588/2019 (H1N1)pdm09-like virus
  - A/Darwin/6/2021 (H3N2)-like virus
  - B/Austria/1359417/2021 (Victoria lineage)-like virus
  - B/Phuket/3073/2013 (Yamagata lineage)-like virus

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  - B/Austria/1359417/2021 (Victoria lineage)-like virus
  - B/Phuket/3073/2013 (Yamagata lineage)-like virus

Label Change to Flucelvax Quadrivalent (ccIIV4)

- **In March 2021, FDA approved use of Flucelvax Quadrivalent for children ages 2 through <4 years**
  - Previously approved for persons ages 4 years and older
- **In October 2021, FDA approval for Flucelvax Quadrivalent was further expanded to include children ages 6 months and older**
  - Approval was based on a randomized immunogenicity and safety study among 2,402 children ages 6-47 months (including 894 children 6-23 months)

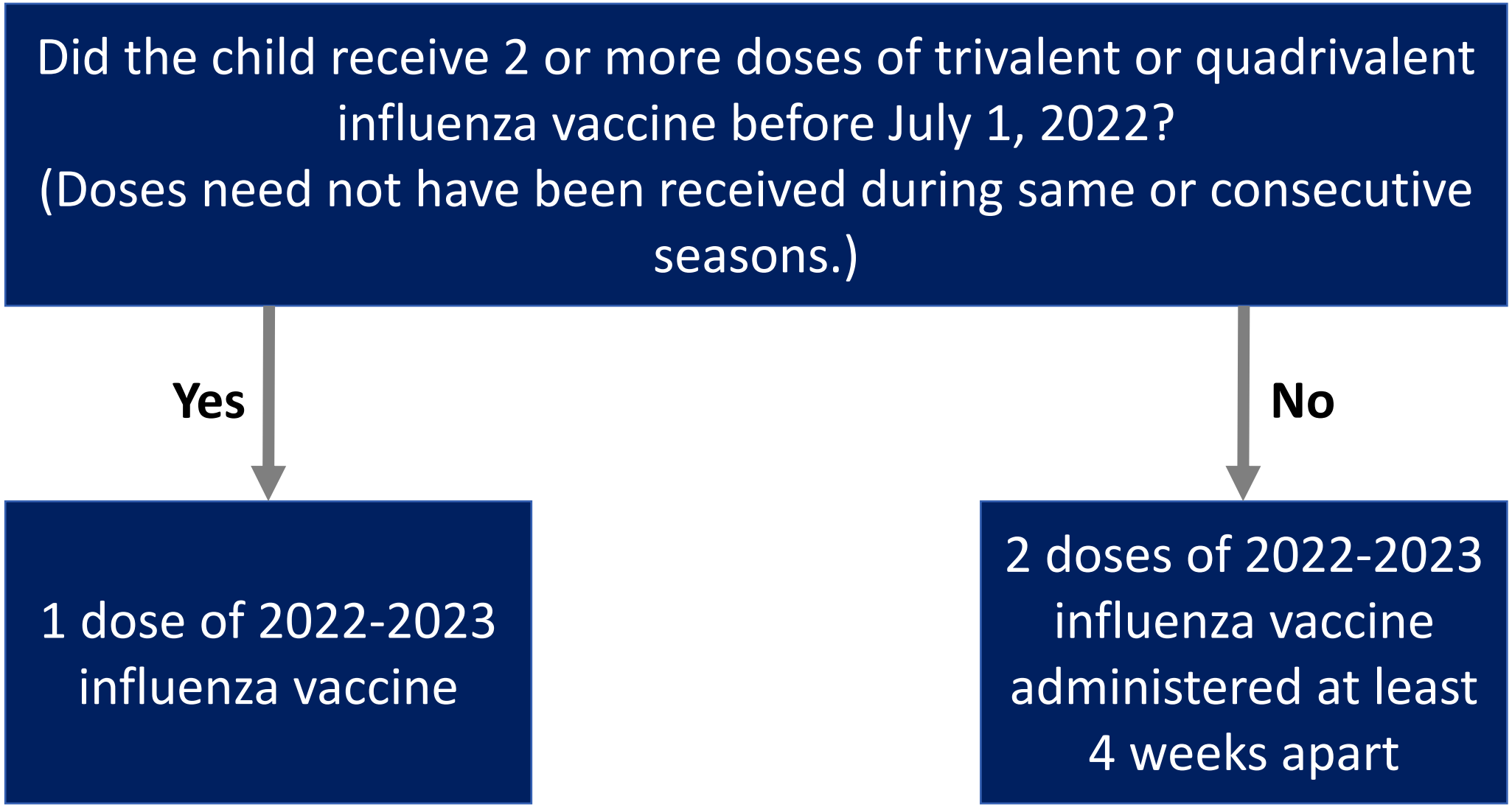
Influenza Vaccines for Children Ages 6 Months and Older

- Five IIVs licensed for children
- Licensed dose volumes for this age group differ

Vaccine	Approved Ages	Dose volume
Afluria Quadrivalent	6 through 35 months	0.25 mL*
	3 years and older	0.5 mL*
Fluarix Quadrivalent	6 months and older	0.5 mL
FluLaval Quadrivalent	6 months and older	0.5 mL
Fluzone Quadrivalent	6 through 35 months	0.25 or 0.5 mL*
	3 years and older	0.5 mL
Flucelvax Quadrivalent	6 months and older	0.5 mL

*Afluria Quadrivalent and Fluzone Quadrivalent 0.25 mL prefilled syringes will not be available for 2022–23; for children 6-35 months of age, the 0.25 mL dose of Afluria must be obtained from a multidose vial; for children 6-35 months of age, the dose of Fluzone from a prefilled syringe would be 0.5 mL

Children Ages 6 Months through 8 Years



Quick Aside about Influenza Vaccines for Children

- **Dose volume is distinct from number of doses needed**
  - A child 6 months through 35 months who should receive 2 doses of influenza vaccine still needs the second dose of vaccine 4 weeks later, even if they received a 0.5 mL initial dose

Timing of Vaccination

- **For most persons who need only 1 dose of influenza vaccine for the season, vaccination should ideally be offered during September or October. However, vaccination should continue throughout the season as long as influenza viruses are circulating.**
  - Children ages 6 months through 8 years who require 2 doses should receive the first dose as soon as vaccine is available

Administration of LAIV4

- **LAIV4 is administered intranasally using the supplied prefilled, single-use sprayer containing 0.2 mL of vaccine.**
  - Half of the total sprayer contents is sprayed into the first nostril while the recipient is in the upright position.
  - The attached divider clip is removed and the second half of the dose administered into the other nostril.
- **If the vaccine recipient sneezes immediately after administration, the dose should not be repeated.**
- **If nasal congestion is present that might interfere with delivery of the vaccine to the nasopharyngeal mucosa, deferral should be considered, or another age-appropriate vaccine should be administered.**

Vaccine Administration Errors: IIVs

- **If a dose less than the necessary volume is administered:**
  - If the error is discovered immediately (before the recipient has left the vaccination setting), administer the remaining additional volume needed.
  - If it is difficult to measure the remaining needed volume, or if the error is discovered after the recipient has left the vaccination setting, administer a repeat full dose.
- **Vaccination with a formulation approved for adult use should be counted as a single dose if inadvertently administered to a child.**

Polio

Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2022

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.
To determine minimum intervals between doses, see the catch-up schedule (Table 2).

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs
Hepatitis B (HepB)	1st dose	◄---- 2nd dose ----►			◄---------- 3rd dose ----------►												
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1st dose	2nd dose	See Notes												
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1st dose	2nd dose	3rd dose			◄---- 4th dose ----►				5th dose					
Haemophilus influenzae type b (Hib)			1st dose	2nd dose	See Notes		◄-- 3rd or 4th dose, See Notes --►										
Pneumococcal conjugate (PCV13)			1st dose	2nd dose	3rd dose		◄---- 4th dose ----►										
Inactivated poliovirus (IPV <18 yrs)			1st dose	2nd dose	◄---------- 3rd dose ----------►							4th dose					
Influenza (IIV4)					Annual vaccination 1 or 2 doses								or	Annual vaccination 1 dose only			
or																	
Influenza (LAIV4)											Annual vaccination 1 or 2 doses			Annual vaccination 1 dose only			
Measles, mumps, rubella (MMR)					See Notes		◄---- 1st dose ----►					2nd dose					
Varicella (VAR)							◄---- 1st dose ----►					2nd dose					
Hepatitis A (HepA)					See Notes		2-dose series, See Notes										
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)														1 dose			
Human papillomavirus (HPV)														See Notes			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2years)			See Notes											1st dose		2nd dose	
Meningococcal B (MenB-4C, MenB-FHbp)														See Notes			
Pneumococcal polysaccharide (PPSV23)																	
Dengue (DEN4CYD; 9-16 yrs)														Seropositive in endemic areas only (See Notes)			

Range of recommended ages for all children
Range of recommended ages for catch-up vaccination
Range of recommended ages for certain high-risk groups
Recommended vaccination can begin in this age group
Recommended vaccination based on shared clinical decision-making
No recommendation/ not applicable

Routine Polio Schedule

IPV Dose	Routinely Recommended Age
1	2 months
2	4 months
3	6–18 months
4	4–6 years

Catch-Up Polio Schedule

Dose	Minimum Age	Minimum Interval to the Next Dose
Dose 1	6 weeks	4 weeks
Dose 2	10 weeks	4 weeks
Dose 3	14 weeks	6 months
Dose 4	4 years	----------

Catch-Up Polio Schedule

- **Infants ages 6 months and younger, follow the recommended schedule**
  - If accelerated protection is needed (e.g., travel to polio-endemic area), minimum age and intervals may be followed
- **4 or more doses of IPV vaccine can be administered before age 4 years when a combination vaccine containing IPV is used**
- **4th dose is not needed if the third dose was administered at age 4 years or older and at least 6 months after the previous dose**
- **A dose of IPV on or after age 4 years (i.e., minimum age) is recommended regardless of the number of previous doses.**

Polio-Containing Vaccine Products

Vaccine name	Components	Age indication	Dose in polio series	Injection route
Ipol (SP)	IPV	6 weeks and older	Any	IM or SC
Pentacel (SP)	DTaP-IPV/Hib	6 wks–4 yrs	1–4	IM
Kinrix (GSK)	DTaP-IPV	4–6 yrs	4	IM
Quadracel (SP)	DTaP-IPV	4–6 yrs	4–5	IM
Vaxelis (Merck)	DTap-IPV-Hib-HepB	6 wks–4 yrs	1–3	IM
Pediarix (GSK)	DTaP-HepB-IPV	6 wks–6 yrs	1–3	IM

IM = Intramuscular; SC = Subcutaneous; All vaccines in the table above are non-live

Series Containing OPV

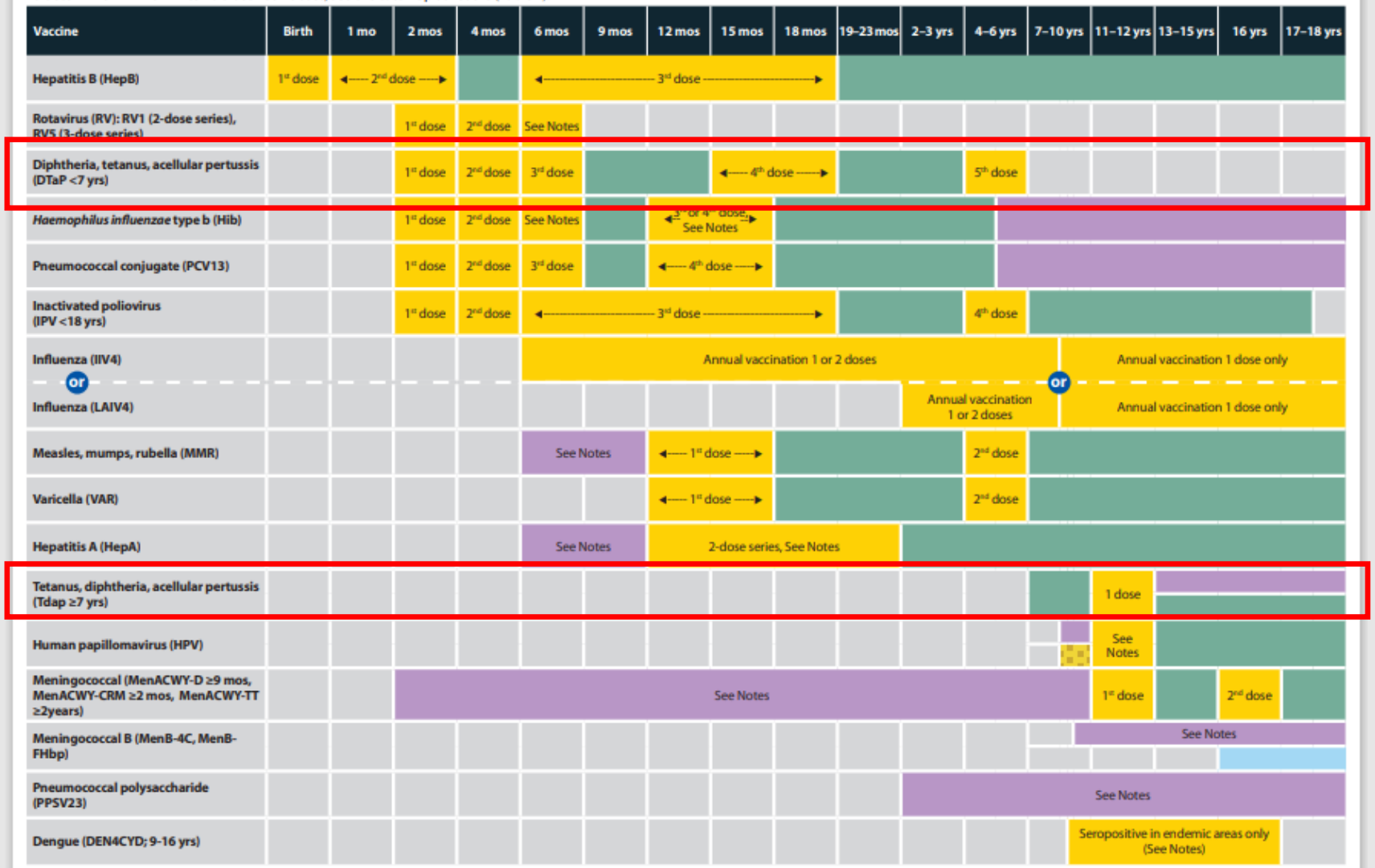
Either mixed OPV-IPV or OPV-only

- **Total number of doses needed to complete the series is the same as recommended by the IPV schedule**
- **Only trivalent OPV (tOPV) counts toward vaccination requirements**
  - Doses of OPV administered prior to April 1, 2016 should be counted
    - Unless specifically noted as administered during a campaign
  - Doses of OPV administered on or after April 1, 2016 should not be counted

DTaP/Tdap

Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2022

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.
To determine minimum intervals between doses, see the catch-up schedule (Table 2).



Routine Schedule

- **DTaP**
  - DTaP is approved for children ages 6 weeks through 6 years
  - 5-dose series at age 2, 4, 6, 15–18 months, 4–6 years

- **Tdap**
  - A single dose of Tdap is routinely recommended for adolescents ages 11 or 12 years

DTaP/DT contain more diphtheria component than Tdap/Td

(Hence, the capital “D”)

DTaP Schedule

- **4th dose may be given earlier if:**
  - Child is at least 12 months of age, and
  - At least 6 months since DTaP dose 3, and
  - The child is unlikely to return at 15–18 months of age

- **5th dose not necessary if:**
  - 4th dose was administered anytime at 4 years of age or older, and
  - 4th dose is at least 6 months after the 3rd dose

- Children who received 5 doses *before* age 4, should receive an **additional dose** of DTaP *after* age 4 and at least 6 months after their previous dose

DTaP Accelerated Schedule

Dose	Routine Age	Minimum Interval to Next Dose
Primary 1	2 months	4 weeks
Primary 2	4 months	4 weeks
Primary 3	6 months	6 months

https://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf

Diphtheria and Tetanus Toxoid (DT) Vaccine

- **DT should only be used for children with a true contraindication to pertussis vaccine**
- **Administered as a 3- or 4-dose series**
  - First dose of DT at age younger than 1 year: Total of 4 doses
  - First dose of DT at age 1 year of age: Total of 3 doses
- **4th or 5th dose at school entry not needed if pertussis vaccine is not being administered**
- **DT vaccine will be discontinued after 2022**

DTaP/DT

Vaccine name (mfr)	Component(s)	Age indication	Dose in DTaP series
Daptacel (SP)	DTaP	6 wks–6 yrs	1–5
Infanrix (GSK)	DTaP	6 wks–6 yrs	1–5
DT (SP, no trade name)	DT	6 wks–6 yrs	1–5
Pediarix (GSK)	DTaP-HepB-IPV	6 wks–6 yrs	1–3
Pentacel (SP)	DTaP-IPV/Hib	6 wks–4 yrs	1–4
Vaxelis (Merck)	DTaP-IPV-Hib-HepB	6 wks–4 yrs	1–3
Kinrix (GSK), Quadracel (SP)	DTaP-IPV	4 yrs–6 yrs	5

All administered by IM (Intramuscular) injection

Combination Vaccines

- **Pentacel (DTaP-IPV/Hib)**
  - Ages: 6 weeks–4 years
  - Routine schedule: 2, 4, 6, 15 –18 months of age
  - Approved for dose 1, 2, 3, 4 of DTaP series
- **Results in a 5-dose IPV series, which is acceptable**

Combination Vaccines, cont.

- **Pediarix (DTaP-HepB-IPV)**
  - Ages: 6 weeks–6 years
  - Routine schedule: 2, 4, 6 months of age
  - Approved for dose 1, 2, 3 of DTaP series
- **Results in a 4-dose HepB series, which is acceptable**

Combination Vaccines, cont.

- **Vaxelis (DTaP-IPV-Hib-HepB)**
  - Ages: 6 weeks–4 years
  - Routine schedule: 2, 4, 6 months of age
  - Approved for dose 1, 2, 3 of DTaP series
- **Results in a 4-dose HepB series, which is acceptable**

Tdap/Td Vaccines

Vaccine name	Component(s)	Age indication
Boostrix	Tdap	10 years and older
Adacel	Tdap	10–64 years
TDVAX	Td	7 years and older
TENIVAC	Td	7 years and older

All administered by IM (Intramuscular) injection

Inadvertent DTaP Administration

- If DTaP is administered to a fully vaccinated child aged 7–9 years, an adolescent Tdap dose should be administered at age 11–12 years

- If DTaP is administered to an undervaccinated child aged 7–9 years, this dose should count as the Tdap dose of the catch-up series, and the child should receive an adolescent Tdap dose at age 11–12 years

- If DTaP is administered to a person aged ≥10 years, this dose should count as the adolescent Tdap dose routinely administered at age 11–12 years

Inadvertent Tdap Administration

- **If Tdap is inadvertently administered as one of the first 3 doses of the DTaP series, the Tdap should NOT be counted as valid and should be repeated with DTaP**

- **If the inadvertent Tdap dose was either the 4th or 5th dose in the child's primary DTaP series, then that dose may be counted as valid and need not be repeated**
  - A child who received Tdap as a fourth dose should complete the pediatric schedule with DTaP as the fifth dose

Catch-Up Job Aids

Catch-Up Guidance for Children 4 Months through 6 Years of Age

Diphtheria-, Tetanus-, and Pertussis-Containing Vaccines: DTaP/DT[1]

IF current age is	AND # of previous doses of DTaP or DT is[1]	AND	AND	THEN	Next dose due
4 through 6 years	Unknown or 0	→	→	Give Dose 1 (DTaP) today	Give Dose 2 (DTaP) at least 4 weeks after Dose 1
	1	It has been at least 4 weeks since Dose 1	→	Give Dose 2 (DTaP) today	Give Dose 3 (DTaP) at least 4 weeks after Dose 2
		It has **not** been 4 weeks since Dose 1	→	No dose today	Give Dose 2 (DTaP) at least 4 weeks after Dose 1
	2	It has been at least 4 weeks since Dose 2	→	Give Dose 3 (DTaP) today	Give Dose 4 (DTaP) at least 6 calendar months after Dose 3
		It has **not** been at least 4 weeks since Dose 2	→	No dose today	Give Dose 3 (DTaP) at least 4 weeks after Dose 2
	3	It has been at least 6 calendar months since Dose 3	→	Give Dose 4 (DTaP) today	Give Tdap at 11 to 12 years of age
		It has **not** been at least 6 calendar months since Dose 3	→	No dose today	Give Dose 4 (DTaP) at least 6 calendar months after Dose 3
			It has **not** been at least		Give Dose 5 (DTaP) at least

Meningitis

Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2022

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.
To determine minimum intervals between doses, see the catch-up schedule (Table 2).

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs
Hepatitis B (HepB)	1st dose	◄— 2nd dose —►			◄———— 3rd dose ————►												
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1st dose	2nd dose	See Notes												
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1st dose	2nd dose	3rd dose			◄— 4th dose —►				5th dose					
Haemophilus influenzae type b (Hib)			1st dose	2nd dose	See Notes		◄— 3rd or 4th dose, See Notes —►										
Pneumococcal conjugate (PCV13)			1st dose	2nd dose	3rd dose		◄— 4th dose —►										
Inactivated poliovirus (IPV <18 yrs)			1st dose	2nd dose	◄———— 3rd dose ————►							4th dose					
Influenza (IIV4)					Annual vaccination 1 or 2 doses								Annual vaccination 1 dose only				
or													or				
Influenza (LAIV4)											Annual vaccination 1 or 2 doses		Annual vaccination 1 dose only				
Measles, mumps, rubella (MMR)					See Notes		◄— 1st dose —►					2nd dose					
Varicella (VAR)							◄— 1st dose —►					2nd dose					
Hepatitis A (HepA)					See Notes		2-dose series, See Notes										
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)														1 dose			
Human papillomavirus (HPV)														See Notes			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2years)			See Notes											1st dose		2nd dose	
Meningococcal B (MenB-4C, MenB-FHbp)														See Notes			
Pneumococcal polysaccharide (PPSV23)											See Notes						
Dengue (DEN4CYD; 9-16 yrs)														Seropositive in endemic areas only (See Notes)			

Range of recommended ages for all children
Range of recommended ages for catch-up vaccination
Range of recommended ages for certain high-risk groups
Recommended vaccination can begin in this age group
Recommended vaccination based on shared clinical decision-making
No recommendation/ not applicable

MenACWY Recommendations for Healthy Children/Adolescents

- **Primary vaccination: 1 dose at age 11 or 12 years**
- **Booster vaccination: 1 dose at age 16 years**
- **Catch up vaccination**
  - 1 dose at age 13–15 years
  - Single booster at ages 16–18 years (minimum interval 8 weeks)
  - No booster if primary dose administered on or after 16th birthday
- **No product preference**

Information from Meningococcal Vaccination: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020 | MMWR (cdc.gov)

MenACWY use in Healthy Children Before Age 11 years

- **MenAWCY at age 10 years**
  - Do NOT need routine MenACWY at age 11 – 12 years
  - Give booster at age 16 years

- **MenACWY before age 10 years**
  - Give routine MenACWY at 11 – 12 years with booster at 16 years

MenB Recommendations for Healthy Children/Adolescents

- **Not routinely recommended for all adolescents**
- **Primary vaccination: 2 doses at ages 16–23 years based on shared clinical decision-making (preferred age 16–18 years)**
  - MenB-FHbp (Trumenba®): 2 doses at 0 and 6 months
  - MenB-4C (Bexero®): 2 doses separated by at least 1 month
- **Booster vaccination: NOT recommended**
- **No product preference**

Information from Meningococcal Vaccination: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020 | MMWR (cdc.gov

Pneumococcal

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These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.
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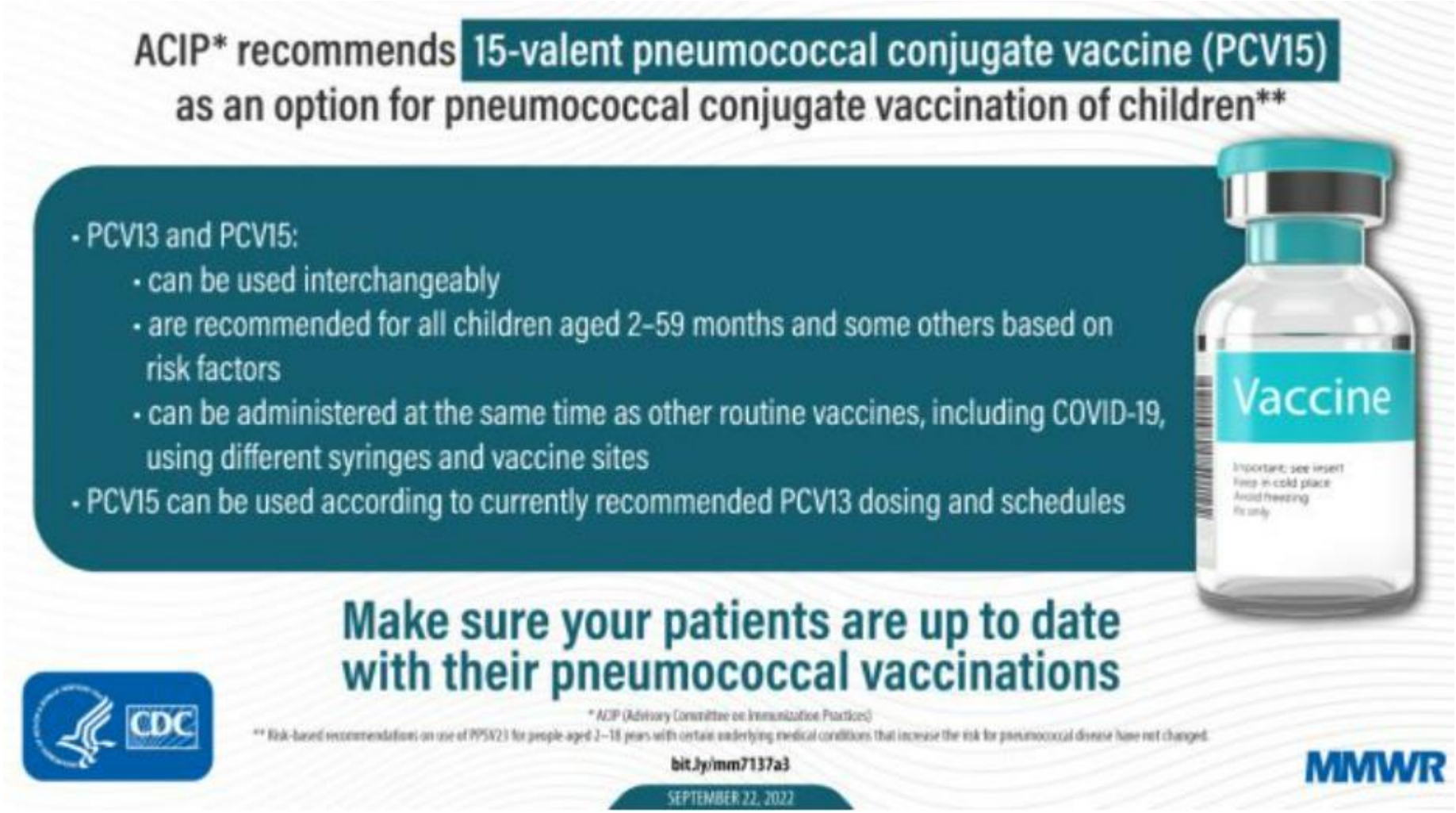
Hepatitis B (HepB)	1st dose	◄---- 2nd dose ----►			◄---------- 3rd dose ----------►												
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1st dose	2nd dose	See Notes												
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1st dose	2nd dose	3rd dose			◄---- 4th dose ----►				5th dose					
Haemophilus influenzae type b (Hib)			1st dose	2nd dose	See Notes		◄- 3rd or 4th dose, See Notes -►										
Pneumococcal conjugate (PCV13)			1st dose	2nd dose	3rd dose		◄---- 4th dose ----►										
Inactivated poliovirus (IPV <18 yrs)			1st dose	2nd dose	◄---------- 3rd dose ----------►							4th dose					
Influenza (IIV4)					Annual vaccination 1 or 2 doses								Annual vaccination 1 dose only				
or													or				
Influenza (LAIV4)											Annual vaccination 1 or 2 doses		Annual vaccination 1 dose only				
Measles, mumps, rubella (MMR)					See Notes		◄---- 1st dose ----►					2nd dose					
Varicella (VAR)							◄---- 1st dose ----►					2nd dose					
Hepatitis A (HepA)					See Notes		2-dose series, See Notes										
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)														1 dose			
Human papillomavirus (HPV)														See Notes			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2years)			See Notes											1st dose		2nd dose	
Meningococcal B (MenB-4C, MenB-FHbp)														See Notes			
Pneumococcal polysaccharide (PPSV23)											See Notes						
Dengue (DEN4CYD; 9–16 yrs)														Seropositive in endemic areas only (See Notes)			

Range of recommended ages for all children
Range of recommended ages for catch-up vaccination
Range of recommended ages for certain high-risk groups
Recommended vaccination can begin in this age group
Recommended vaccination based on shared clinical decision-making
No recommendation/ not applicable

Updated Recommendation: PCV15 as an Option for Vaccination of Children



General Recommendations

- **PCV13 or PCV15 is routinely recommended for infants and children ages 2 months—59 months**
  - 4 dose series at age 2, 4, 6, and 12 to 15 months
  - Fewer doses required if series started at age 7 months or older

Vaccination Schedule for Unvaccinated Older Children

Age at First Dose	Primary Series*	Booster
2–6 months	3 doses	1 dose at 12–15 months
7–11 months	2 doses	1 dose at 12–15 months
12–23 months	2 doses	No
24–59 months	1 dose	No
24–71 months, with medical conditions**	2 doses	No

*Minimum interval between doses is 8 weeks except for children vaccinated at age <12 months, for whom the minimum interval between doses is 4 weeks. The minimum age for administration of first dose is 6 weeks.; see *MMWR* 2010;59(RR-11):1–19, at https://www.cdc.gov/mmwr/pdf/rr/rr5911.pdf

**Chronic heart, lung disease, diabetes, CSF leak, cochlear implant, sickle cell disease, other hemoglobinopathies, functional or anatomic asplenia, HIV infection, immunocompromising conditions

Recommendations for Individuals with Certain Medical Conditions

- **A dose of PCV13 or PCV15 should be administered to children 6—18 years of age who are at increased risk for invasive pneumococcal disease (and no prior PCV13 doses)**
  - Functional or anatomic asplenia, including sickle cell disease
  - HIV infection and other immunocompromising conditions
  - Cochlear implant
  - CSF leak

*Off-label recommendation, MMWR, June 28, 2013, Vol 62, #25

PPSV23 Vaccine Recommendations

- Recommended for children ages 2–18 years at increased risk
- When both PCV13/PCV15 and PPSV23 are indicated, administer PCV13/PCV15 first
- PCV13/PCV15 and PPSV23 should not be administered at the same visit

HPV

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To determine minimum intervals between doses, see the catch-up schedule (Table 2).

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs
Hepatitis B (HepB)	1st dose	◄---- 2nd dose ----►			◄---------- 3rd dose ----------►												
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1st dose	2nd dose	See Notes												
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1st dose	2nd dose	3rd dose			◄---- 4th dose ----►				5th dose					
Haemophilus influenzae type b (Hib)			1st dose	2nd dose	See Notes		◄-- 3rd or 4th dose, See Notes --►										
Pneumococcal conjugate (PCV13)			1st dose	2nd dose	3rd dose		◄---- 4th dose ----►										
Inactivated poliovirus (IPV <18 yrs)			1st dose	2nd dose	◄---------- 3rd dose ----------►							4th dose					
Influenza (IIV4)					Annual vaccination 1 or 2 doses								Annual vaccination 1 dose only				
or													or				
Influenza (LAIV4)											Annual vaccination 1 or 2 doses		Annual vaccination 1 dose only				
Measles, mumps, rubella (MMR)					See Notes		◄---- 1st dose ----►					2nd dose					
Varicella (VAR)							◄---- 1st dose ----►					2nd dose					
Hepatitis A (HepA)					See Notes		2-dose series, See Notes										
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)														1 dose			
Human papillomavirus (HPV)														See Notes			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2years)			See Notes											1st dose		2nd dose	
Meningococcal B (MenB-4C, MenB-FHbp)														See Notes			
Pneumococcal polysaccharide (PPSV23)											See Notes						
Dengue (DEN4CYD; 9-16 yrs)														Seropositive in endemic areas only (See Notes)			

Range of recommended ages for all children
Range of recommended ages for catch-up vaccination
Range of recommended ages for certain high-risk groups
Recommended vaccination can begin in this age group
Recommended vaccination based on shared clinical decision-making
No recommendation/ not applicable

HPV Routine Schedule

- **Routinely recommended at age 11–12 years**
  - Permissive recommendation: Can start at age 9 years
  - Catch-up recommended through age 26 years
- **2- or 3-dose series depending on age at initial vaccination**
  - Age 9–14 years at initial vaccination: 2-dose series at 0, 6–12 months
  - Age 15 years or older at initial vaccination: 3-dose series at 0, 1–2, 6 months
- **Immunosuppressed persons**
  - 3-dose series, regardless of age at initial vaccination

E-mail Your Immunization Questions to Us

- NIPINFO@cdc.gov