

Immunizations (Guideline Intervals Using “The Rule of Six” for Vaccines Birth to Six Years)

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Key Points

- Vaccines are necessary for prevention of and protection from several diseases.
- Administering vaccines in a consistent manner and schedule is critical to reduce provider error, maximize vaccine effect, and protect populations from vaccine preventable diseases.
- Regarding the standard immunization schedule for vaccines given from birth to 6 years of age, the “Rule of Six” can be used to ensure consistency and preservation of vaccine timing intervals - which are generally multiples of the number 6.
- The “Rule of Six” does not apply to catch-up vaccination schedules.
- Following the recommendations from the Centers for Disease Control and Prevention (CDC), the Advisory Committee on Immunization Practices (ACIP), and the American Academy of Pediatrics (AAP) is of utmost importance when administering vaccines.

Definition and Assessment

Definition

“The Rule of Six,” which is a method used to ensure consistency and preservation of vaccine timing intervals is based on multiples of the number 6. These intervals pertain only to the standard immunization schedule and not to catch-up schedules.

- Be familiar with recommendations from the Center for Disease Control (CDC), the Advisory Committee on Immunization Practices (ACIP), and the American Academy of Pediatrics (AAP).
- Consistency in vaccine administration and schedules is of utmost importance to reduce provider error and simplify the administration regimen.
- Timing intervals for vaccinations are often divisible by or are multiples of the **number 6**, particularly as related to vaccines given from birth through 4-6 years of age. For example:
 - The earliest time that the first set (i.e., 2 month set) of vaccines can be given is at **6 weeks** of age.¹
 - The optimal timing interval between the primary series (i.e., the 2 month, 4 month, and 6 month sets of vaccines) is **6 weeks**. However, for a catch up schedule or during an epidemic, the vaccine-timing interval can be as short as 4 weeks.¹
 - There are **3** vaccine timing periods or ages at which a child must have reached a minimum absolute age in order to receive necessary vaccines. These timing periods or ages are **6 months, 12 months, and 48 months – all multiples of 6.**¹

Assessment

Vaccines are necessary for disease prevention; however, vaccination schedules have become increasingly complex secondary to the addition of new vaccine recommendations and new vaccine combinations.²

Table 1. Recommended Ideal Vaccine Schedule for Children Ages 0-6 Years

To view a larger image on your device, please click or touch the image.

Birth	2 Months	4 Months	6 Months	9 Months	12 Months	15 Months	18 Months	24 Months	48-72 Months 4-6 Years
Hep B	DTaP IPV Hib* PCV Hep B RV*	DTaP IPV Hib* PCV RV*	DTaP IPV Hib* PCV Hep B RV*		MMR Varicella Hep A	DTaP Hib PCV	Hep A#2 (Hep A#1 if declined @ 12 Months)	Hep A#2 (if Hep A #1 was given @ 18 Months)	DTaP IPV MMR Varicella

* The number of Hib doses and RV doses (2 or 3) before the first birthday may be manufacturer-dependent.

Management of Vaccines and Timing Intervals

Hep B (Hepatitis B vaccine)

- If a mother is Hepatitis B surface antigen positive (HBsAg+), the infant should receive both

Hepatitis B vaccine and Hepatitis B Immunoglobulin (HBIG) within **12 hours** of birth preferably.

- The final dose of Hepatitis B vaccine should be administered no earlier than age **24 weeks** or **6 months** of age. To reiterate, a child must be a minimum of **6 months** of age in order to receive the final dose of Hepatitis B vaccine.¹

DTaP (Diphtheria and tetanus toxoids and acellular pertussis vaccine)

- The minimum age that the first DTaP vaccine can be given is **6 weeks** of age.
- An appropriate timing interval among the primary series (i.e., 2 month, 4 month, and 6 month sets) is **6 weeks**.
- **Six (6) months** must elapse between the third and fourth doses of DTaP. While the fourth dose may be administered as early as 12 months of age, **6 months** must have elapsed since the third dose.
- The final dose of DTaP should be administered between **48 and 72 months**, or 4-6 years of age. A child must be a minimum of **48 months** in order for the final dose in the DTaP series to be valid. While 5 doses of DTaP vaccine are preferred, 4 doses will suffice as long as the fourth dose is given on or after **48 months** of age.¹

IPV (Inactivated poliovirus vaccine)

- The minimum age that the first IPV vaccine can be given is **6 weeks** of age.
- The final dose in the IPV vaccine series should be given on or after **48 months** of age and at least **6 months** after the previous dose. While 4 doses of IPV vaccine are preferred, **3 doses** will suffice as long as the **third dose** is given on or after **48 months** of age.¹

Hib (*Haemophilus influenzae* type b conjugate vaccine)

- The minimum age that the first Hib vaccine can be given is **6 weeks** of age.
- All children should receive one Hib vaccine on or after **12 months** of age;
 - A child **>60 months** of age is ineligible for a Hib vaccine.
 - Hib vaccine is not routinely recommended for children older than **60 months**.
 - However, 1 dose of Hib vaccine should be given to unvaccinated or partially vaccinated children **≥ 60 months** who have leukemia, HIV infection, asplenia (functional or anatomic), or other immune deficiency.¹

PCV (Pneumococcal conjugate vaccine)

- The minimum age that the first PCV vaccine can be given is **6 weeks** of age.
- PCV is recommended for all children **<60 months** of age.
- For children who are incompletely vaccinated for their age, 1 dose of PCV may be given for children **≥24 months** but **<60 months**.¹

Hep A (Hepatitis A)

- The minimum age that the first Hep A vaccine can be given is **12 months** of age.
- **Six (6) months** must elapse between the first and second doses of Hepatitis A vaccine.¹

MMR (Measles, Mumps, and Rubella vaccine)

- The minimum age at which MMR vaccine may be given is **12 months** of age.
- The second dose of MMR vaccine should be given between the ages of **48 months and 72**

months of age.

- However, the second dose may be given earlier as long as **30 days** have elapsed since the first dose.
- Twenty-eight (28) days is actually acceptable; however, **30 days** follows nicely for the purpose of the “Rule of Six.”¹

Varicella vaccine

- The minimum age at which the first Varicella vaccine can be given is **12 months** of age.
- The second dose of Varicella vaccine is routinely given between **48 months and 72 months** of age. However, the second dose may be administered as early as **30 days** after the first and be considered valid, but preferentially the second dose of varicella vaccine should be given **3 months** after the first dose if the second dose is given before **48 months** of age.
- Ideally, MMR and Varicella vaccines should be given concurrently no earlier than **12 months** of age. However, if given on different dates, **30 days** minimum must elapse between vaccines.¹

Influenza vaccine (seasonal)

- A child must be a minimum age of **6 months** to receive inactivated influenza vaccine. Two (2) doses separated by a minimum of **30 days** are required for children younger than 9 years of age who are receiving influenza vaccine for the first time or who were vaccinated for the first time during the previous influenza season but only received 1 vaccine dose.
- Live attenuated influenza vaccine administered intranasally should not be given to children **<24 months** (2 years) of age. Additionally, the intranasal preparation should not be given to those patients who are immunocompromised or who have asthma or to those children **24 - 48 months** of age who have had wheezing in the previous 12 months.¹

Conclusion

In conclusion, there are many options for vaccine administration; however, being conscientious about appropriate timing intervals for vaccine administration and being consistent in the practice approach facilitate adherence to the recommended vaccine schedule with reduction in provider error.

This guideline was developed to improve health care access in Arkansas and to aid health care providers in making decisions about appropriate patient care. The needs of the individual patient, resources available, and limitations unique to the institution or type of practice may warrant variations.

References

References

1. Centers for Disease Control and Prevention. Recommended immunization schedules for persons aged 0 through 18 years - United States, 2012. MMWR 2012; 61(5):1-4.
2. Luman ET, Shaw KM, Stokley SK. Compliance with vaccination recommendations for U. S. children. Am J Prev Med. 2008;34(6):463-70.

Additional Selected Reference

Centers for Disease Control and Prevention. Recommended immunization schedules for persons

aged 0 through 18 years - United States, 2012. MMWR 2012; 61(5):1-4.