

Pediatric Immunization Delay: Cases, Pearls & Pitfalls

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- All images are copyright free.

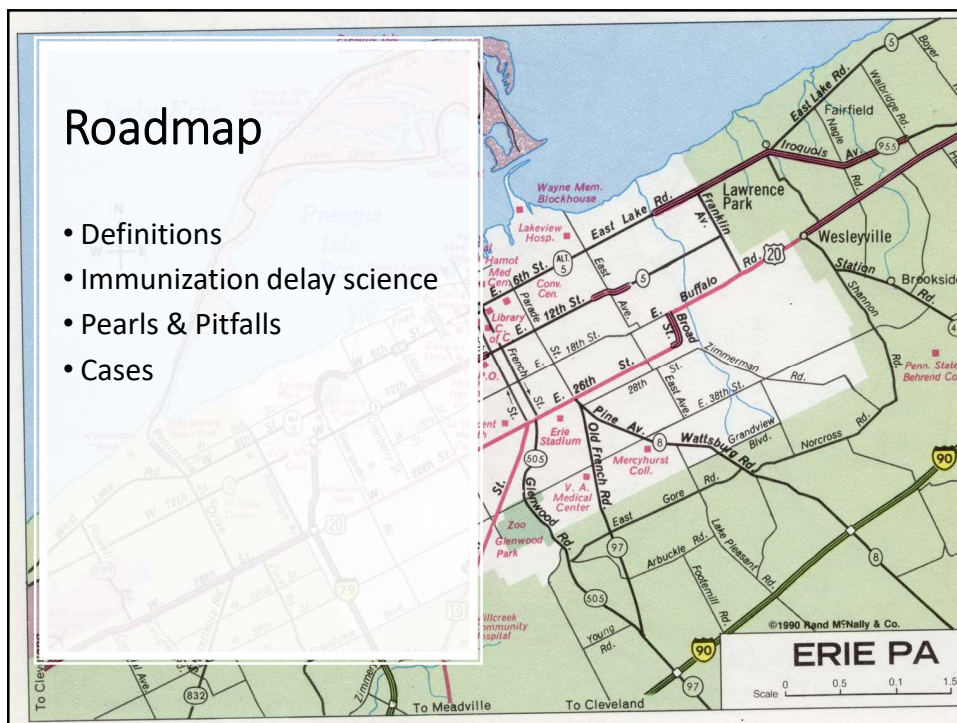
Objectives:

After participating in this lecture/discussion, the NP will be able to

- Analyze several common cases and apply several vaccine rules to bring delayed children up to date and avoid missed immunization opportunities.
- Evaluate and manage a child with delayed immunizations and determine a specific management strategy for common clinical scenarios involving medical complexity thereby formulating a plan for the entire case.

Roadmap

- Definitions
- Immunization delay science
- Pearls & Pitfalls
- Cases



Definition: Missed Immunization Opportunity

- “A missed opportunity occurs when an individual eligible for vaccination has contact with a health facility and does not receive a needed vaccine, despite having no contraindications.”

- Velandia-gonzalez, Trumgo, Diaz-Ortega, Bravo-Alcantara, Danovaro-Holliday, Dietz, Ruiz-Matus, 2015
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4357152/>

Definition: Medical Complexity

- “Children with medical complexity have extensive needs for health services, experience functional limitations, and are high resource utilizers.” AAP, 2016

- <http://pediatrics.aappublications.org/content/early/2016/11/17/peds.2016-3021>

- Chronic diseases and poverty are interconnected in a vicious cycle.

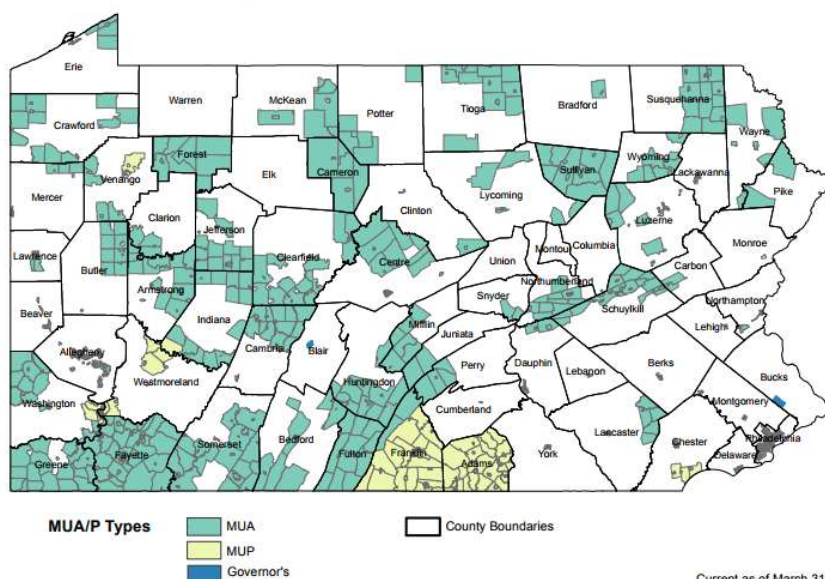
- WHO, 2017
http://www.who.int/chp/chronic_disease_report/part2_ch2/en/

Definitions: Medically Underserved

- “Medically Underserved Areas (MUAs) and Medically Underserved Populations (MUPs) identify geographic areas and populations with a lack of access to primary care services. These groups may face economic, cultural, or linguistic barriers to health care.” HRSA, 2017

- <https://bhwh.hrsa.gov/shortage-designation/maup>

**Pennsylvania's Currently Designated
Medically Underserved Areas/Populations (MUA/MUP)**



Reference: http://www.health.pa.gov/Your-Department-of-Health/Offices%20and%20Bureaus/Health%20Planning/Documents/HPSA/MUA_MUP_map_3_31_2015.pdf

Recommended vaccines by decade

Source: <http://www.chop.edu/centers-programs/vaccine-education-center/vaccine-history/developments-by-year>

Late 1950s	Late 1960s	1985 - 1994	1994 - 1995	2000	2010	2017
Smallpox Diphtheria* Tetanus* Pertussis* <u>Polio (IPV)</u> 5 antigens	Smallpox Diphtheria* Tetanus* Pertussis* <u>Polio (OPV)</u> <u>Measles</u> <u>Mumps</u> <u>Rubella</u> 8 antigens	Diphtheria* Tetanus* Pertussis* Measles** Mumps** Rubella** Polio (OPV) <u>Hib</u> 8 antigens	Diphtheria* Tetanus* Pertussis* Measles** Mumps** Rubella** Polio (OPV) Hib <u>Hepatitis B</u> 9 antigens	Diphtheria* Tetanus* Pertussis* Measles** Mumps** Rubella** Polio (IPV) Hib Hepatitis B <u>Varicella</u> <u>Hepatitis A</u> 11 antigens	Diphtheria* Tetanus* Pertussis* Measles** Mumps** Rubella** Polio (IPV) Hib Hepatitis B Varicella Hepatitis A <u>Pneumococcal</u> <u>Influenza</u> <u>Rotavirus</u> 13 antigens	Diphtheria* Tetanus* Pertussis* Measles** Mumps** Rubella** Polio (IPV) Hib Hepatitis B Varicella Hepatitis A <u>Pneumococcal</u> <u>HPV</u> <u>Meningitis</u> <u>Meningitis B</u> 16 antigens

* Given in combination as DTP

** Given in combination as MMR

Vaccines are complex

- 29 doses before school age
- Not including flu → ~35 doses

Physician Knowledge of Catch-up Regimens and Contraindications for Childhood Immunizations

Nicole J. Cohen, Diane S. Lauderdale, Priya B. Shete, John B. Seal, Robert S. Daum
Pediatrics May 2003, 111 (5) 925-932; DOI: 10.1542/peds.111.5.925

 PDF

Factors associated with above average score

Cohen et al., 2003

- Female gender
- Specialization in pediatrics
- *Participation in VFC
- Higher proportion of patients receiving Medicaid
- Academic affiliation
- Urban location
- Many patients > 5 years
- Many vaccine encounters/day

Conclusions

Cohen et al., 2003

- “Physicians are not proficient at designing catch-up regimens for children with immunization delay.”
- “Suggests a need for educational opportunities and practice aids to aid physicians in design of catch-up vaccine regimens.”

The Cognitive Miser



Cognitive
Ease

Cognitive
Strain

- To navigate our world, we use shortcuts (heuristics) to conserve our limited cognitive energy.
- Cognitive Ease: Effortless, feels familiar, good, true
- Cognitive strain: Effortful, uncomfortable, uncertain

• REFERENCE: Dr. Marcuse, there never was an age of reason
<http://www.withinreachwa.org/courses/there-never-was-an-age-of-reason/>

Pearls: Have Strategies

- Get all dates on one screen or piece of paper.
- No one remembers the table, read it ***once every year, line by line*** then you will know where to go in the footnotes.
- Much in NP practice is relative, vaccines are an *exception*.
- All doses count, even if given abroad.



Pearls: Continually Develop Vaccine-specific Knowledge

- Become knowledgeable about vaccines.
 - Get on the Immunization Action Coalition "Needle Tips" emails
 - Do Immunization CE a couple times per year.
- Keep references on immunizations handy in at least 2 places
 - Phone app
 - Posted on your desk
 - In a small notebook in your lab coat
 - Posted in the exam room



Barrier: Vaccine Refusal



- Listen well, keep them engaged.
- Careful of body language/tone.
- Refer to reliable sources of info: Vaccine center at CHOP or CDC
- Dr. Marcuse: Make a strong, individualized recommendation for vaccines & avoid scientific jargon.
 - <http://www.withinreachwa.org/age-of-reason-register/>
- Dr. Alexander: Risk to other patients in the office is low
 - <http://www.pedsuniversity.org/Education/tabid/106/cstl/ViewCourseDetail/mid/556/ItemId/916/catid/1/Default.aspx>
- Document refusal on the AAP vaccine refusal form (keep a stash of 3)
 - https://www.aap.org/en-us/Documents/immunization_refusaltovaccinate.pdf



<https://pixabay.com/en/travel-pinned-pinning-maps-atlas-2650303/>

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE [FIGURE 2]).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded in gray.

[illegible]

2017-2018

Pennsylvania School Vaccine Requirements

Reference: <http://www.health.pa.gov/My%20Health/Immunizations/Documents/SIR8.pdf>

- 4 doses of tetanus, diphtheria, and acellular pertussis* (1 dose on or after the 4th birthday)
- 4 doses of polio (4th dose on or after 4th birthday and at least 6 months after previous dose given)**
- 2 doses of measles, mumps, rubella***
- 3 doses of hepatitis B
- 2 doses of varicella (chickenpox) or evidence of immunity

FOR ATTENDANCE IN 7TH GRADE:

- 1 dose of tetanus, diphtheria, acellular pertussis (Tdap) on the first day of 7th grade.
- 1 dose of meningococcal conjugate vaccine (MCV) on the first day of 7th grade.

FOR ATTENDANCE IN 12TH GRADE:

- 1 dose of MCV on the first day of 12th grade. If one dose was given at 16 years of age or older, that shall count as the twelfth grade dose.

Case Studies: Assumptions & Rules

- You already know the normal well child schedule.
 - NIP-IT: <http://nip-it.org/>
 - You Call the Shots: <https://www.cdc.gov/vaccines/ed/youcalltheshots.html>
- Assume *TODAY* is the day of the office visit
- Decide when the return to clinic interval should be (RTC) & your plan.
- For the sake of this exercise you have no combination shots, only single vaccines.

CASE STUDIES

Case 1: 5 month old child

Twist: ED follow up visit for OM, on Day 4/10 Amoxicillin, parents report having no medical insurance

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	2 MOS		
Rotavirus	2 MO			
DTaP	2 MO			
HIB	2 MO			
PCV 13	2 MO			
IPV	2 MO			
FLU				
MMR				
VAR				
HEP A				

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 ¹	Birth	4 weeks	8 weeks and at least 16 weeks after first dose. Minimum age for the final dose is 24 weeks.		
Rotavirus ²	6 weeks	4 weeks	4 weeks ³		
Diphtheria, tetanus, and acellular pertussis ⁴	6 weeks	4 weeks	4 weeks	6 months	6 months ⁵
Haemophilus influenzae type b ⁶	6 weeks	4 weeks if first dose was administered before the 1 st birthday. 8 weeks (as final dose) if first dose was administered at age 12 through 14 months. No further doses needed if first dose was administered at age 15 months or older.	4 weeks ⁷ 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) or unknown. 8 weeks and age 12 through 59 months (as final dose) ⁸ • 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 1 st birthday, and second dose administered at younger than 15 months; OR • if both doses were PRP-OMP (PedvaxHIB, Comvax) and were administered before the 1 st birthday. No further doses needed if previous dose was administered at age 15 months or older.	8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before the 1 st birthday.	
Pneumococcal ⁹	6 weeks	4 weeks if first dose administered before the 1 st birthday. 8 weeks (as final dose for healthy children) if first dose was administered at the 1 st birthday or after. No further doses needed for healthy children if first dose was administered at age 24 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) or unknown. 8 weeks (as final dose) if current age is 12 through 59 months and first dose was administered before the 1 st birthday, and second dose administered at younger than 15 months; OR • if both doses were PRP-OMP (PedvaxHIB, Comvax) and were administered before the 1 st birthday. No further doses needed if previous dose was administered at age 15 months or older.		
Inactivated poliovirus ¹⁰	6 weeks	4 weeks ¹¹	4 weeks ¹²		
Measles, mumps, rubella ¹³	12 months	4 weeks			
Varicella ¹⁴	12 months	3 months			
Hepatitis A ¹⁵	12 months	6 months			

2. Rotavirus (RV) vaccines. (Minimum age: 6 weeks for both RV1 [Rotarix] and RV5 [RotaTeq])
Routine vaccination:
 Administer a series of RV vaccine to all infants as follows:
 1. If Rotarix is used, administer a 2-dose series at ages 2 and 4 months.
 2. If RotaTeq is used, administer a 3-dose series at ages 2, 4, and 6 months.
 3. If any dose in the series was RotaTeq or vaccine product is unknown for any dose in the series, a total of 3 doses of RV vaccine should be administered.

Catch-up vaccination:
 • The maximum age for the first dose in the series is 14 weeks, 6 days; vaccination should not be initiated for infants aged 15 weeks, 0 days, or older.
 • The maximum age for the final dose in the series is 8 months, 0 days.
 • For other catch-up guidance, see Figure 2.

Case 1: 5 month old child

Twist: ED follow up visit for OM, on Day 4/10 Amoxicillin, parents report having no medical insurance

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	2 MOS	RTC 4 WKS	
Rotavirus	2 MO	TODAY	RTC 4 WKS	
DTaP	2 MO	TODAY	RTC 4 WKS	
HIB	2 MO	TODAY	RTC 4 WKS	
PCV 13	2 MO	TODAY	RTC 4 WKS	
IPV	2 MO	TODAY	RTC 4 WKS	
FLU	RTC 4 WKS			
MMR				
VAR				
HEP A				

FAQ: ANTIBIOTICS

REFERENCE:
<http://www.immunize.org/askexperts/precautions-contraindications.asp>

- **Q:** Should you administer vaccine to a child who is taking antibiotics?
- **A:** Treatment with antibiotics is not a valid reason to defer vaccination. If the child or adult is otherwise well, or has only a minor illness, vaccines should be administered.
- But if the person has a moderate or severe acute illness (regardless of antibiotic use) vaccination **may be** deferred until the person's condition has improved.

FAQ: How many vaccines in one visit?

Reference:
<http://www.immunize.org/askexperts/administering-vaccines.asp>

- **Q:** How many vaccines can be given during an office visit?
- **A:** All vaccines can be administered at the same visit*. There is **no upper limit** for the number of vaccines that can be administered during one visit. ACIP and AAP consistently recommend that all needed vaccines be administered during an office visit. Vaccination should not be deferred because multiple vaccines are needed. All live vaccines (MMR, varicella, zoster, live attenuated influenza, yellow fever, and oral typhoid) can be given at the same visit. If live vaccines are not administered during the same visit, they should be separated by 4 weeks or more.
- ***Exception:** When giving PCV 13 & 23 together AND/OR meningitis

Barrier: Under - vaccinators



- Most likely to be poor & medically underserved.
- Frequently minority
- Limited access to care and lack a medical home
- ***Under immunization is likely unintentional***
- They need resources: VFC
- We need systems (Recall)
- Resource: There Never Was An Age of Reason - Vaccines, Vaccine Hesitancy, and Vaccine Decision Making
 - Presented by: Dr. Edgar K. Marcuse, MD, MPH, FPIDS Emeritus Professor, Pediatrics University of Washington
 - <http://www.withinreachwa.org/age-of-reason-register/>

Case 2: 9 month old

Twist: ED f/u, looks well except for mild end expiratory wheezing, today is day 3/5 prednisolone 1 mg/kg/day for suspected bronchiolitis

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	3 MOS		
Rotavirus	3 MOS	6 MOS		
DTaP	3 MOS	6 MOS		
HIB	3 MOS	6 MOS		
PCV 13	3MOS	6 MOS		
IPV	3 MOS	6 MOS		
FLU				
MMR				
VAR				
HEP A				

Case 2: 9 month old

Twist: ED f/u, looks well except for mild end expiratory wheezing, today is day 3/5 prednisolone 1 mg/kg/day for suspected bronchiolitis

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	3 MOS	TODAY	WHY NOT?
Rotavirus	3 MOS	6 MOS	WHY NOT?	
DTaP	3 MOS	6 MOS	TODAY	RTC AGE 15 MOS
HIB	3 MOS	6 MOS	TODAY	RTC AGE 15 MOS
PCV 13	3MOS	6 MOS	TODAY	RTC AGE 15 MOS
IPV	3 MOS	6 MOS	TODAY	RTC AGE 15 MOS
FLU	TODAY	RTC 4 WKS		
MMR	RTC AGE 12 MOS			
VAR	RTC AGE 12 MOS			
HEP A	RTC AGE 12 MOS			

FAQ: STEROIDS part 1

REFERENCE: <http://www.immunize.org/askexperts/precautions-contraindications.asp>

- **Q: Should vaccines be withheld for patients on steroids?**
- **A:** Steroid treatment, and possible immunosuppression, is primarily a concern with live virus vaccines. Steroid therapy that is short term (less than 2 weeks); alternate-day; physiologic replacement; topical (skin or eyes); aerosol; or given by intra-articular, bursal, or tendon injection are **not considered contraindications to the use of live virus vaccines.**

FAQ: STEROIDS: part 2

REFERENCE: <http://www.immunize.org/askexperts/precautions-contraindications.asp>

- A dose equivalent to either **2 mg/kg of body weight or a total of 20 mg per day of prednisone (or equivalent) for 2 or more weeks** as sufficiently immunosuppressive to raise concern about the safety of vaccination with live virus vaccines (MMR, varicella, yellow fever).
- Wait at least **1 month** after discontinuation of therapy or reduction of dose before administering a live virus vaccine to patients who have received high systemically absorbed doses of corticosteroids for 2 weeks or more.
- Inactivated vaccines & toxoids can be administered to all immunocompromised patients in usual doses and schedules, although the response to these vaccines may be suboptimal.

Case 3: 15 mos

Twist: Dad has cancer and is on chemotherapy, parents have questions re: alternative vaccine schedules. Mom is pregnant

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	13 MOS		
Rotavirus				
DTaP	13 MOS			
HIB	13 MOS			
PCV 13	13 MOS			
IPV	13 MOS			
FLU				
MMR				
VAR				
HEP A	13 MOS			

Case 3: 15 mos

Twist: Dad has cancer and is on chemotherapy, parents have questions re: alternative vaccine schedules. Mom is pregnant

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	13 MOS	TODAY	WHY NOT?
Rotavirus	WHY NOT?			
DTaP	13 MOS	TODAY	RTC 6 MOS	
HIB	13 MOS	TODAY	WHY NOT?	
PCV 13	13 MOS	TODAY	WHY NOT?	
IPV	13 MOS	TODAY	RTC 6 MOS	
FLU	TODAY	RTC 4 WKS		
MMR	TODAY	RTC AGE 4 YRS		
VAR	TODAY	RTC AGE 4 YRS		
HEP A	13 MOS	RTC AGE 19-21 MOS		

Barrier: Alternative schedules

- No evidence.
- What do you do?
- Check out Immunize.org's response:
 - http://www.immunize.org/concerns/offit_moser2009.pdf

The Problem With Dr Bob's Alternative Vaccine Schedule
 Paul A. Offit and Charlotte A. Moser
Pediatrics 2009;123:e164-e169
 DOI: 10.1542/peds.2008-2189

FAQ: HOUSEHOLD CONTACTS & LIVE VACCINES

REFERENCE:
http://www.immunize.org/askexperts/experts_var.asp

- **Q:** Can a young child, who was recently vaccinated for chickenpox, spread the vaccine virus to other household members?
- **A:** Data suggests healthy children are unlikely to transmit vaccine virus....Transmission of vaccine occurs mostly...when the vaccinated person develops a rash following vaccination.

FAQ: PREGNANCY OF MOMS & STAFF

REFERENCE:
<http://www.immunize.org/askexperts/precautions-contraindications.asp>

- **Q:** Which vaccines are contraindicated if a child's mother or other household member is pregnant?
- **A:** Having a pregnant woman in a household, including the child's mother, is not a contraindication to administration of any routinely recommended vaccine.
- **Q:** Is there a risk for a pregnant staff person administering live-virus vaccines?
- **A:** A pregnant woman may administer any vaccine except smallpox vaccine

Case 4: 24 mos

Twist: Shots given in another country (no records),
needs to go to daycare tomorrow, despite well
appearance, temp is 101 °F rectal

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B				
Rotavirus				
DTaP				
HIB				
PCV 13				
IPV				
FLU				
MMR				
VAR				
HEP A				

Case 4: 24 mos

Twist: Shots given in another country (no records),
needs to go to daycare tomorrow, despite well
appearance, temp is 101 °F rectal

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	TODAY	RTC 4 WKS	RTC 8 WKS	WHY NOT?
Rotavirus	WHY NOT?			
DTaP	TODAY	RTC 4 WKS	RTC 4 WKS	
HIB	TODAY	WHY NOT?		
PCV 13	TODAY	WHY NOT?		
IPV	TODAY	RTC 4 WKS	RTC 4 WKS	
FLU	TODAY	RTC 4 WKS		
MMR	TODAY	RTC 4 YRS		
VAR	TODAY	RTC 4 YRS		
HEP A	TODAY	RTC 6 MOS		

Barrier: FEVER part 1

REFERENCE:
<http://www.immunize.org/askexperts/precautions-contraindications.asp>



• **Q:** We frequently see patients who are febrile or have an acute illness and are due for vaccinations.

• **A:** A "moderate or severe acute illness" is a precaution for administering any vaccine. A mild acute illness (e.g., diarrhea or mild upper-respiratory tract infection) with or without fever is not a precaution, and vaccines may be given.

Barrier: FEVER part 2

REFERENCE:
<http://www.immunize.org/askexperts/precautions-contraindications.asp>



- The concern in vaccinating someone with moderate or severe illness is that a fever following the vaccine could complicate management of the concurrent illness - it could be difficult to determine if the fever was from the vaccine or due to the concurrent illness.
- In deciding whether to vaccinate a patient with moderate or severe illness, the clinician needs to determine if deferring vaccination will increase the patient's risk of vaccine-preventable diseases, as is the case if the patient is unlikely to return for vaccination or to seek vaccination elsewhere.

Barrier: CHECKING VITAL SIGNS

REFERENCE:
<http://www.immunize.org/askexperts/precautions-contraindications.asp>



- **Q:** Do we need to check vital signs before giving vaccines?
- **A:** No. ACIP does not recommend routinely checking a patient's temperature or other vital signs before vaccination. Requiring these extra steps can be a barrier to immunization.

FAQ: No prior immunizations

REFERENCE:
<http://www.immunize.org/askexperts/scheduling-vaccines.asp>

- **Q:** When a 3-month-old infant presents having had no prior immunizations, would you start the accelerated schedule?
- **A:** The accelerated schedule should be used when the child is **more than a month behind** schedule, until you get them caught up. An accelerated schedule is acceptable as long as minimum ages and minimum intervals are observed for each dose.

Case 5: 5 yo, 1 mo

Twist: parents report peanut and egg allergy, needs shots for school entry by tomorrow

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	8 MOS	22 MOS	
Rotavirus	8 MOS			
DTaP	8 MOS	22 MOS	31 MOS	
HIB	8 MOS	22 MOS		
PCV 13	8 MOS	22MOS		
IPV	3 MOS	22 MOS	31 MOS	
FLU				
MMR	22 MOS			
VAR	22 MOS			
HEP A	22 MOS			

Case 5: 5 yo, 1 mo

Twist: parents report peanut and egg allergy, needs shots for school entry by tomorrow

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	Birth	8 MOS	22 MOS	WHY NOT?
Rotavirus	8 MOS	WHY NOT?		
DTaP	8 MOS	22 MOS	31 MOS	TODAY
HIB	8 MOS	22 MOS	WHY NOT?	
PCV 13	8 MOS	22MOS	WHY NOT?	
IPV	3 MOS	22 MOS	31 MOS	TODAY
FLU	TODAY	RTC 1 MO		
MMR	22 MOS	TODAY		
VAR	22 MOS	TODAY		
HEP A	22 MOS	TODAY		

FAQ: Food allergy & Eggs

REFERENCE:
<http://www.immunize.org/askexperts/scheduling-vaccines.asp>

- **Q:** For which vaccines is an egg allergy a contraindication?
- **A:** ACIP revised its guidance on influenza vaccination of persons with egg allergy in 2016. ACIP recommends that people with a history of egg allergy who have experienced only hives after exposure to egg should receive any inactivated influenza vaccine without specific precautions (except a 15-minute observation period for syncope).
- People who report having had an **anaphylactic reaction to egg** (more severe than hives) may also receive any age-appropriate influenza vaccine. The vaccine for those individuals should be administered in a medical setting (such as a health department or physician office).

FAQ: Food allergy & Peanuts

REFERENCE:
<http://www.immunize.org/askexperts/scheduling-vaccines.asp>

- **Q:** Is peanut allergy a contraindication to any vaccine?
- **A:** No. Vaccines available in the United States do not contain peanut products.

FAQ: Food allergy & Gelatin

REFERENCE:
<http://www.immunize.org/askexperts/scheduling-vaccines.asp>

- **Q: What should we ask a patient when screening to determine a gelatin allergy?**
- **A:** Begin by asking a general question about whether the person has an allergy to any food, medication, or vaccine. If they report an allergy to gelatin or foods that contain gelatin, you could follow up by asking if they can eat Jell-O™ and gelatin-type products. Gelatin allergies are extremely rare. Only severe, life-threatening (anaphylactic) allergy is a contraindication to vaccination.

Case 6: 6 yrs 11 mos

Twist: born abroad & no record of vaccines & needs a PPD due to exposure in school

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B				
Rotavirus				
DTaP				
HIB				
PCV 13				
IPV				
FLU				
MMR				
VAR				
HEP A				

Case 6: 6 yrs 11 mos

Twist: born abroad & no record of vaccines & needs a PPD due to exposure in school

	Dose 1	Dose 2	Dose 3	Dose 4
Hep B	TODAY	RTC 4 WKS	RTC 4 MO	
Rotavirus	WHY NOT?			
DTaP	TODAY <u>DTaP</u>	RTC 4 WKS <u>Tdap</u>	RTC 6 MO <u>Tdap</u>	RTC 6 MO <u>Tdap</u>
HIB	WHY NOT?			
PCV 13	WHY NOT?			
IPV	TODAY	RTC 4 WKS	RTC 2 MO	RTC 6 MO
FLU	TODAY	RTC 4 WKS		
MMR	TODAY	RTC 4 WKS		
VAR	TODAY	RTC 3 MO		
HEP A	TODAY	RTC 6 MO		

FAQ: MMR & TST

Reference:
http://www.immunize.org/askexperts/experts_mmr.asp

- **Q:** Can I give a tuberculin skin test (TST) on the same day as a dose of MMR vaccine?
- **A:** TST can be applied before or on the same day that MMR vaccine is given. However, if MMR vaccine is given on the previous day or earlier, the TST should be delayed for at least 28 days. Live measles vaccine given prior to the application of a TST can reduce the reactivity of the skin test because of mild suppression of the immune system.

Case progression

- You ran out of PPD inoculum and the patient needs MMR today.
- Q: Can the patient come back in 1 week for PPD?
- A: NO, do the PPD next month.

**KEEP
CALM
AND
VACCINATE**



<https://freerangestock.com/photos/76280/syringe-magnifier-indicates-clinic-healthcare-and-magnify.html>

References & Resources

- CDC
 - [Schedules](#)
 - <https://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-combined-schedule-bw.pdf>
 - You call the shots
 - <https://www.cdc.gov/vaccines/ed/youcalltheshots.html>
- CHOP Just the Vax Provider Toolkit
 - <http://www.chop.edu/centers-programs/vaccine-update-healthcare-professionals/just-vax-provider-toolkit>
- Immunization Action Coalition
 - <http://www.immunize.org/>
- Medscape: Polysaccharide Vaccines
 - <http://www.medscape.com/viewarticle/4311272>
- Within Reach: “There never was an Age of Reason – Vaccines, Vaccine Hesitancy, and Vaccine Decision Making by Dr. Edgar Marcuse
 - <http://www.withinreachwa.org/age-of-reason-register/>

Resource: ICD 10 coding

ICD 10 CODE	EXPLANATION
Z23	Encounter for immunization
Z23.82	Immunization not carried out because of caregiver refusal
Z28.3	Under-immunization status
Z28.03	Immunization not carried out due to immune status of patient
Z28.04	Immunization not carried out due to patient allergy to vaccine or component
Z28.01	Immunization not carried out due to acute illness
R50.9	Fever
Z91.010	Allergy to peanuts
Z59.5	Poverty
Z91.012	Allergy to eggs