

# Vaccine Safety: Understanding Vaccine Contraindications and Precautions

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Karen Lewis, MD; AIPO Medical Director



ARIZONA DEPARTMENT  
OF HEALTH SERVICES

*Health and Wellness for all Arizonans*

# Definitions

- **Contraindication**
  - Increased likelihood of serious reaction
- **Precaution**
  - Might have increase in chance of severity of adverse reaction
  - Might compromise the ability of vaccine to produce immunity



# Contraindication

## Increased likelihood of serious reaction



Clip art

- Anaphylaxis to vaccine component or previous dose (all vaccines)
- Live virus in immune compromised
- History of intussusception
- Unexplained encephalopathy within seven days of DTaP/Tdap
- Pregnancy (live)
- Antivirals (LAIV, varicella)
- < 6 weeks of age (Hib)

# Precautions



- May have increased chance of severity of adverse reaction
- May hurt ability of vaccine to produce immunity



# Always with Every Vaccine

## Contraindication

- Severe allergic reaction (anaphylaxis) after a previous vaccine dose or to a vaccine component



## Precaution

- Moderate or severe acute illness with or without fever



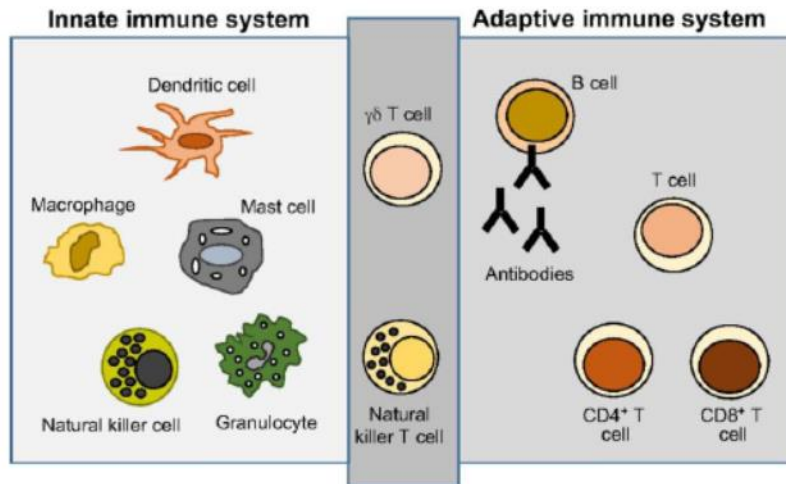
# Pregnancy



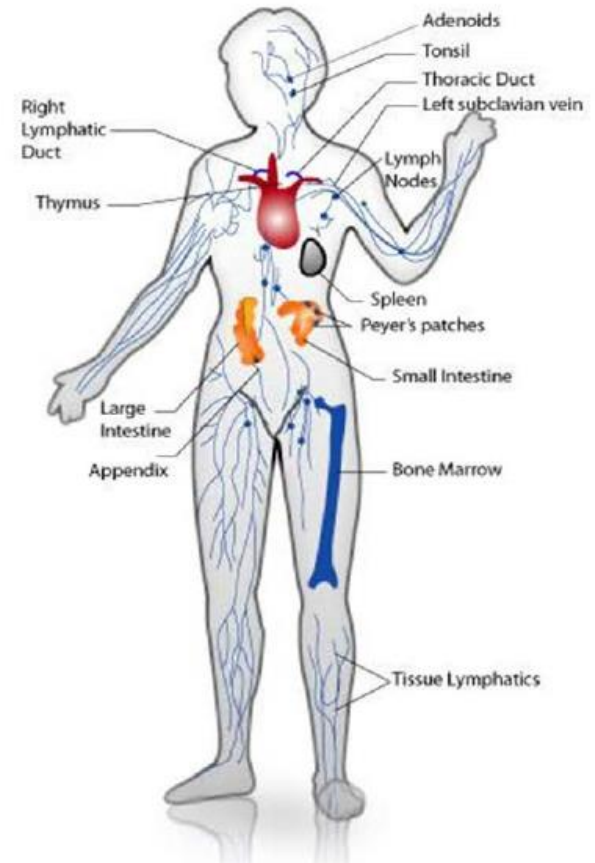
- Contraindicated
  - Live vaccines
- Precautions
  - Most other vaccines
- Indicated
  - Influenza vaccine
  - Tdap

# Immune System

## Variety of Immune Cells



## Anatomy and Immunity



# Treatments that Can Affect Immune Response to Vaccines

- IV and IM immune globulins
- Azathioprine, 6-MP, methotrexate
- Corticosteroids
- Immune modulators
- Anti-rejection medicines
- Radiation
- Chemotherapy
- Hematopoietic stem cell transplantation





# Measles-Mumps-Rubella Vaccine



Clip Art

- Contraindication
  - Known severe immunodeficiency
  - Pregnancy
- Precautions
  - Recent receipt of antibodies (IM, IV, blood)
  - History of low platelets or TTP
  - Need for TB skin test

# Varicella Vaccine



- Contraindications
  - Known severe immunodeficiency
  - Pregnancy
- Precautions
  - Recent receipt of antibodies (IM, IV, blood)
  - Specific antivirals for 24 hours before vaccine; hold antivirals for 14 days after vaccine

# Zoster Vaccine

- Contraindicated
  - Severe immunodeficiency
  - Pregnancy
- Precaution
  - Recent antibody receipt
  - Recent antivirals

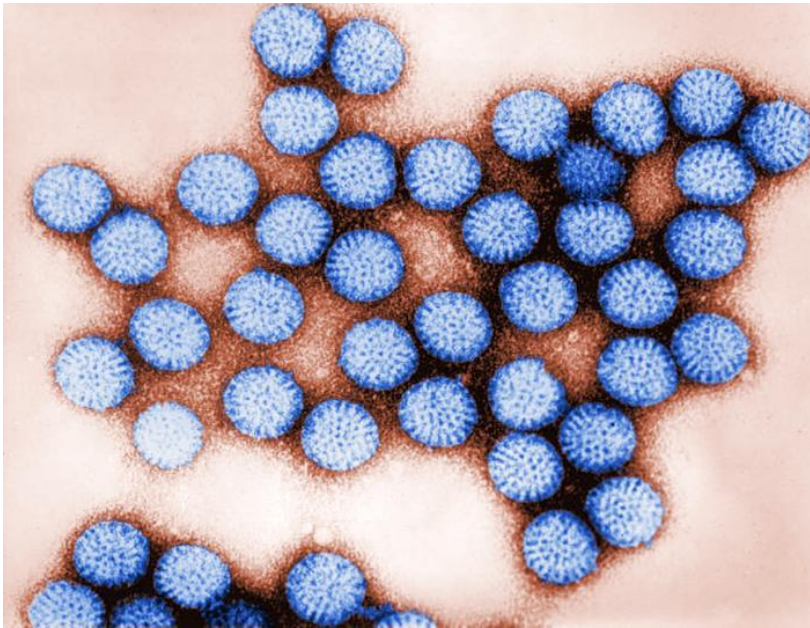
## OK even if:

- No history of chicken pox
- History of shingles
- HIV if CD4 count  $\geq 200$
- Low dose 6-MP, azathioprine, methotrexate, corticosteroids



# Rotavirus Vaccine

- Rotavirus by EM



CDC PHIL # 178

- Contraindication: SCID, or anaphylaxis to latex\*
- Precautions:
  - Altered immunity
  - History of intussusception
  - Chronic intestinal disease
  - $\pm$  Spina bifida or bladder exstrophy
- Evaluate infants if persistent diarrhea after rotavirus vaccine

\*Rotarix

# Diphtheria-Tetanus-Pertussis Vaccines

- Contraindication
  - Unexplained encephalopathy within seven days of DTaP/Tdap
- Precautions
  - GBS within 6 weeks of tetanus vaccine
  - Arthus reaction after vaccine (T & D)
  - Progressive neurologic disorder (pertussis)
  - $\geq 105^{\circ}\text{F}$  ( $\geq 40.5^{\circ}\text{C}$ ) within 48 hours\*
  - Shock-like state within 48 hours\*
  - Persistent crying  $\geq 3$  hours within 48 hours\*
  - Seizure within 3 days\*



\*After DTaP only

# Arthus Reaction



- Exaggerated local response to tetanus or diphtheria vaccines
- Extensive, painful swelling
- More common in adults
- High existing antibody levels
- Avoid revaccination for 10 years



# Influenza Vaccines (IIV)



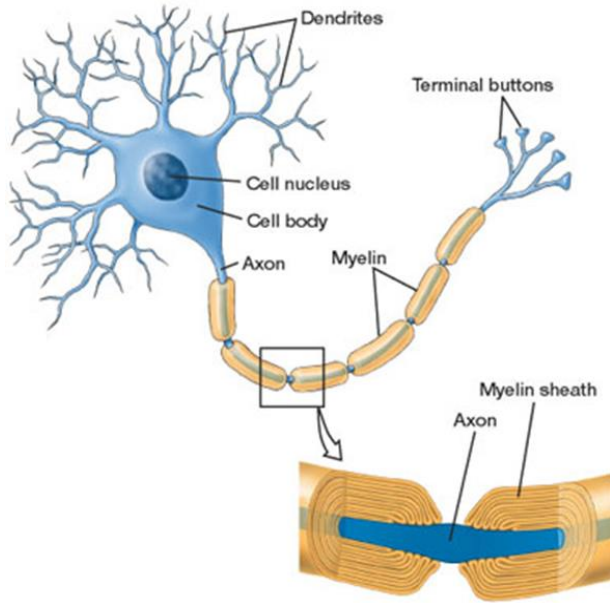
- Contraindication
  - Anaphylaxis to vaccine or component
- Precautions
  - Guillain-Barré Syndrome within six weeks
  - Egg allergy other than just hives?

# Egg Allergies and Influenza Vaccine

Reaction to eggs?	Wait after	Where give
Hives	15 minutes	Anywhere
Anaphylaxis Angioedema Epinephrine need Respiratory distress Lightheadedness Persistent vomiting	15 minutes	Only in locations where HCP trained in response to anaphylaxis



# Small Risk of Guillain-Barré Syndrome within 6 Weeks of Vaccination



- Influenza vaccine
- Tetanus vaccine
- Some vaccines conjugated to tetanus toxoid:

Hiberix

Prevnar13

ActHIB

Menactra

Pentacel

Menveo

# Live-Attenuated Influenza Vaccine



CDC PHIL #11872

- Temperature dependent mutant
- Mimics influenza infection
- Only one instance of person-to-person transmission
- Previously used for healthy 2-49 year olds

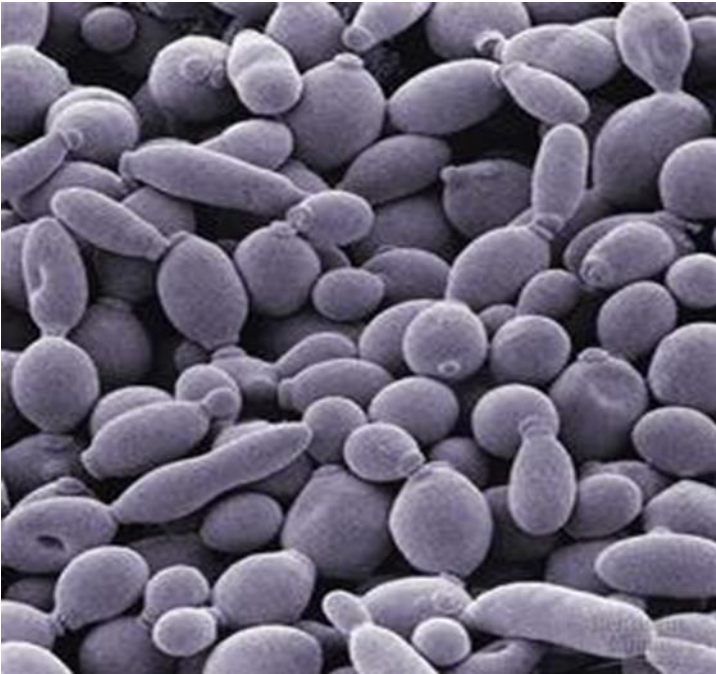
CDC. MMWR. August 26, 2016, (RR-5)

# Other Vaccine Details



- Hib vaccine
  - $< 6$  weeks of age is a contraindication
- Hepatitis B
  - Infant  $< 2$  kg is a precaution
- HPV vaccine
  - Pregnancy is a precaution
- Recombinant influenza
  - OK if severe egg allergy

# Vaccines that Contain Yeast



- Engerix-B (HepB)
- Recombivax HB (HepB)
- Twinrix (HepA & HepB)
- Pediarix  
(DTaP-HepB-IPV)
- Gardasil 9 (HPV9)
- Prevnar13 (PCV13)
- Menveo (MCV4)

# Invalid Contraindications #1



- Mild illness
- Low grade fever
- URI
- Cold
- Otitis media
- Mild diarrhea

# Invalid Contraindications #2

- Antibiotics
  - Except oral typhoid
- Antivirals
  - Except LAIV, Varicella
- Disease exposure
- Convalescence



# Invalid Contraindications #3



- Pregnant or immunosuppressed person in household
  - Except vaccinia (smallpox)
  - ± LAIV
  - ± Varicella
- Family history of adverse events

# Invalid Contraindications #4



- Breastfeeding
  - Except vaccinia (smallpox)
  - Avoid yellow fever vaccine
- Preterm Birth  $\geq 2$  kg
  - OK to vaccinate
  - Very low birth weight
    - OK by one month
    - Hepatitis B vaccine issues



# Invalid Contraindications #5



- Multiple vaccines
  - Exemptions
    - PCV13 & Menactra in asplenic
    - Vaccinia (smallpox) and varicella
- TB skin test (TST) and vaccines
  - OK same or separate days
  - But...TST could be smaller within 4 weeks of MMR

# Invalid Contraindications #6



- Non-specific allergies
- Duck or feather allergy
- Penicillin allergy
- Relatives with allergies
- Receiving allergy shots
- Non-anaphylactic or not severe allergy to vaccine component

# Balance Risks

## Disease Complications

Meningitis  
Pneumonia  
Cellulitis  
Gangrene  
Paralysis  
Liver cancer  
Cervical cancer  
Throat cancer  
Dehydration  
Death

## Reaction to Vaccine

Local reaction at site  
Fever, febrile seizure  
Rash  
Low platelet count  
Intussusception  
Guillain-Barré Syndrome  
Disease from live virus vaccine  
Anaphylaxis



# Questions?



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# Review Objectives

- Explain the difference between a vaccine contraindication and a precaution.
- Describe one vaccine contraindication that applies to all vaccines.
- Name at least one vaccine that is contraindicated in pregnancy.



# CASE STUDY

- A 15-year-old pregnant adolescent has not received any doses of Tdap, MCV4, and HPV. Which of these vaccines can she receive during pregnancy?



# CASE STUDY

- A 1-month-old full term female received HBIG and hepatitis B vaccine at birth because her mother is chronically infected with hepatitis B.
- She is seen today to get her second dose of hepatitis B vaccine. What other vaccines should she receive?



# CASE STUDY

- A pregnant woman brings in her 4-year-old son for routine vaccinations. He has been up-to-date according to CDC recommendations, so he is due for an MMR, a varicella vaccine, his 5<sup>th</sup> DTaP and his 4<sup>th</sup> inactivated polio vaccine.
- What vaccines can he get in light of his mother being pregnant?





# CASE STUDY

- A 30-year-old healthy woman is breastfeeding. Are there any vaccines that she should not receive if they were otherwise indicated?



# CASE STUDY

- A 5-year-old girl was diagnosed four months ago as having Kawasaki disease. She received 2 grams/kg of IV immune globulin. She comes to your office today for her 4-6 year old vaccines: DTaP, IPV, MMR, and Varicella.
- Which vaccines can she receive?
- Can she receive an influenza vaccine?



# THANK YOU

Karen Lewis, MD| AIPO Medical Director

[Karen.lewis@azdhs.gov](mailto:Karen.lewis@azdhs.gov) | 602-364-3856

azhealth.gov

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