



The presentation will begin shortly. There will be no audio until then.

They're Alive!!!

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Outline

- Chickenpox (Varicella)
- Measles, Mumps and Rubella
- MMRV
- Herpes Zoster (Shingles)
- Live attenuated Influenza
- Rotavirus
- Typhoid
- Yellow Fever

What is the Difference between Live and Inactivated Vaccine?

- A live vaccine is a weakened version of a virus designed to generate cell-mediated immunity and neutralizing antibodies.
- An inactivated vaccine consists of virus particles that are cultured to lose their virulence but still retain the ability to induce protective immunity.

Live Vaccines

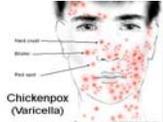
- Usually induces prolonged immunity and require fewer boosters.
- Subsequent exposures to the virus usually results in a rapid antibody response.
- Approximately 90-95% of recipients who receive 1 dose of live vaccine develop protective antibodies, usually within 14 days.
 - Varicella and Mumps antibody response is around 80-85%.
 - Of those who do not respond to the first dose of Varicella or MMR, 97-99% respond to the second.

Live Vaccines Interacting

- All live vaccines indicated as needed can be given at the same time
- All live, injected vaccines that are not given at the same time must be separated by a 4 week (28 day) minimum interval and are not subject to a 4 day grace period.
- Live vaccine administered orally like typhoid and rotavirus can be given any time after receiving injected live vaccine.
 - Oral vaccines will be discussed later in presentation

What is Varicella?

- Chickenpox is a highly contagious disease that is very uncomfortable and can be very serious.
- Chickenpox is caused by the varicella-zoster virus.
- It can be spread very easily from touching the fluids of a chickenpox blister, or if an infected person coughs or sneezes near you.
- It causes a blister-like rash, itching, fever, and malaise.
- It can cause 5-7 missed days of school or work.

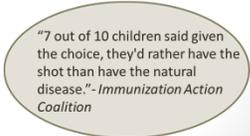


Varicella: A Brief History

- Before the vaccine, approximately 4 million people would get chickenpox each year in the United States.
 - In the last 5 years, 424 cases have been reported in North Dakota but many people do not seek medical care for chickenpox.
- Prior to vaccinating, nationally, 10,500 to 13,000 would be hospitalized each year.
- 100-150 people would die in the U.S. every year from chickenpox.
 - Most people with severe cases were healthy individuals beforehand.

Who is at Risk for Chickenpox?

- Most children completely recover but in some cases it can be serious and even fatal for infants, adolescents, and adults.
- Anyone can be at risk if they have never had chickenpox or have not been vaccinated.
- People who are unvaccinated with no evidence of immunity.
- People traveling out of the country.



Chickenpox Vaccine

- Licensed in 1995 in the U.S.
 - Hospitalizations and deaths have declined >90% since the routine use of varicella vaccine.
- Varicella vaccine is a live attenuated vaccine.
 - The live disease producing virus was weakened or modified to produce an immune response without causing illness in the recipient.
- It is given as an injection into fatty tissue.
- It is stored frozen until ready for administration.

Must be used within 30 minutes of reconstitution

- It is 97% effective in children 12 months-12 years after 2 doses.

Varicella Vaccine Side Effects

- Generally mild and at the injection site
 - Redness
 - Stiffness
 - Soreness
- A very small percentage of people experience a mild rash
- Contraindications
 - People with weakened immune systems
 - People with life-threatening allergies to gelatin or neomycin
 - Women while pregnant or attempting to become pregnant
 - People experiencing serious allergic reaction to the first dose should not get the second dose

Who Should get Varicella Vaccine?

- All children younger than 13 years of age with no documented history of disease.
 - One dose at 12-15 months and a second between 4 and 6 years old
 - It can be given a minimum of 3 months after the 1st dose
- All people age 13 years and older with no documented history of disease
 - One dose immediately and a second dose 4-8 weeks later

Frequently asked Varicella vaccine Administration Question

- There is no contraindication for administering varicella vaccine to a child or person who lives with a pregnant woman or immunosuppressed individuals.
 - In very rare cases, people who developed rashes after the vaccine were able to pass the virus but the more serious threat to a household would be an unvaccinated person developing wild-type varicella that can be transmitted to other household members.

North Dakota Varicella Requirements 2012-2013

- In North Dakota: two doses are required for all children attending school or in a childcare setting.
- Two doses are required for Kindergarten-4th grade
- One dose is required for 5th-8th grade or documented history of disease.
- No Doses are required after 9th grade but anyone not fully vaccinated should be caught up using the age appropriate minimum intervals.
 - Providers should check for chickenpox immunization when patients come in for their adolescent immunizations.

Varicella Vaccine from the VFC Program

- Varicella vaccine is available for children under 18 years who qualify for the VFC program
 - Medicaid eligible
 - American Indian
 - Underinsured
 - Uninsured
 - Or insured children being vaccinated at universal Local Public Health Units (LPHU's)
- It is not supplied by the Immunization Program for use in adults.

What is MMR Vaccine?

MMR is Measles, Mumps and Rubella

Measles

- A respiratory disease caused by a virus also called Rubeola.
- Measles causes fever, runny nose, cough, and a rash all over the body.
 - Usually takes 10-12 days from exposure for first symptom to appear (generally a fever)
 - The rash may appear 2-3 days after the fever
 - Highly contagious and is transmittable from 4 days before the rash appearing through 4 days after

Measles Before the Vaccine

- Before being licensed in 1963:
 - 3-4 million cases each year in the United States
- After introducing routine vaccination in 1963:
 - Significantly lower numbers of cases excluding spikes in 1989-1991 and 2008
 - On average in the U.S. there are 60 cases reported each year from 2001-2010 with years ranging between 37 and 140 cases annually.
 - In the last 5 years, 1 confirmed and 1 probable case of measles have been reported in North Dakota
- It is still a common disease in other countries and is easily contracted when traveling abroad



Mumps

- Mumps is caused by a virus and spreads easily through droplets (coughing, sneezing, and talking).
- Less contagious than chickenpox and measles
- Incubation can range from 12-25 days, contagious from a few days before symptoms start until 5 days after onset of parotitis
- Begins with headache, loss of appetite and low-grade fever
- Parotitis is the swelling of salivary and parotoid glands
- In children, the disease is more mild than in adults and more prone to complications.
 - Meningitis occurs in up to 15% of cases



Mumps Vaccine History

- The vaccine was licensed in 1967
 - There were 212,000 cases in 1964
- The vaccine for mumps was combined with the Measles and Rubella vaccines in 1971.
- Single antigen was available until 1975
 - Mumps is the live attenuated vaccine found in the MMR vaccine.
- 19 cases of Mumps reported in North Dakota since 2007.
 - 7 confirmed
 - 2 probable
 - 10 suspect

Rubella

- Caused by a virus
- Spreads via airborne transmission or droplets of infected people
- Less contagious than measles or chickenpox
- Incubation period of 12-23 days, contagious for seven days prior to rash until 5-7 days after onset of rash
- Mild disease in children but adults tend to have more complications including rare cases of encephalitis and hemorrhage
- Fewer than 25 cases reported annually since 2001
- Symptoms are similar to measles
- Before the vaccine was available:
 - During 1963-1964 12 million people in the U.S. were diagnosed
 - Many of the diagnosed were expectant mothers
 - 11,000 fetuses died and 20,000 babies were born with permanent disabilities.

Congenital Rubella Syndrome (CRS)

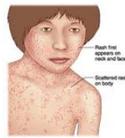
- There are <1 case reported annually after routine vaccination began in the U.S.
- In 28 of 35 cases reported between 1998 and 2011, the mother was born outside of the U.S.
- Worldwide there is still an estimated 100,000 infants born with CRS every year
- Congenital Rubella Syndrome can occur in the developing fetus of a pregnant woman who has contracted rubella during her first trimester.

Congenital Rubella Cont.

- Risk by timing of infection:
 - CDC estimates that 85% of infants infected in the first trimester will be found to be affected if followed after birth
 - After the 20th week of gestation defects become more rare
 - By the third trimester there is no greater risk of defects than found in infants born from uncomplicated pregnancies
- Presentation in infants includes:
 - Deafness in 58% of patients
 - Eye abnormalities like cataracts in 43% of patients
 - Congenital heart disease in 50% of patients
 - Patients may also have spleen, liver or bone marrow problems
 - Mental retardation
 - Developmental disorders

Who is at Risk for Measles, Mumps or Rubella?

- Cases still occur in the United States at low rates and in other countries.
- Any person born in 1957 or later that has no evidence of immunity, history of infection is at risk.



MMR Vaccine Storage

- MMR is a live attenuated vaccine.
- It can be stored in the refrigerator.
 - Diluent should be stored refrigerated or to conserve refrigerator space, at room temperature (DO NOT FREEZE).
 - MMR and Varicella diluent can be used interchangeably.
 - MMR and Varicella diluent can not be used to reconstitute any other vaccine and no other vaccine diluent can be used for MMR or Varicella.



MMRV

- MMRV is the combination vaccine for Measles, Mumps, Rubella, and Varicella.
- It should not be given for the first dose between 12-15 months due to increased risk of febrile seizures.
- Because of the Varicella component the vaccine must be stored in a freezer and remain frozen until reconstitution.
- **Must be used within 30 minutes of reconstitution**

MMR Schedule

- The first dose should be given between 12-15 months and the 2nd at 4-6 years.
- The minimum interval between doses when catching up an older child or adult is 4 weeks.
- An adult between the ages of 19 and 56 (Born after 1957) must be caught up with 1 or 2 doses.
 - Routine vaccination for people born before 1957 is not recommended.
- For healthcare personnel, 2 doses of MMR separated by 4 weeks is recommended if there is no evidence of immunity.

Common MMR Side Effects

- Because the vaccine is weak versions of the 3 diseases, it can cause mild cases of the disease they were designed to prevent, much milder than contracting the disease naturally.
- Fever is the most common side effect 5%-15%
- Mild rash in 5% of recipients
- Joint pain from the rubella component is reported in 25% of adult women
- Low platelet count (Thrombocytopenia) in 1 out of every 30-40,000 vaccinated people

Who Should and Should not get the MMR vaccine?

- Should:
 - Anyone born after 1957 without a valid contraindication should be vaccinated or have documented history of disease.
- Should not:
 - Contraindications
 - Severe allergic reaction following the first dose of MMR or to gelatin or neomycin
 - Pregnancy is a temporary contraindication
 - Severely immunocompromised people



MMR and the VFC Program

- MMR and MMRV are available through the Immunization program for VFC eligible children and insured children that receive MMR/MMRV at LPHU's
 - Only uninsured or underinsured adults can receive MMR vaccine from the VFC program
 - MMRV should not be administered unless both MMR and Varicella vaccine is indicated
 - MMRV is not licensed for use in adults

North Dakota Requirements for MMR

- 2 doses of MMR are required in North Dakota for Kindergarten through 12th grade

Vaccine Type	Minimum Number of Doses Required Per Grade		
	Kindergarten	Grades 1-6	Grades 7-12
MMR	2	2	2

- In child care 0, 1 or 2 doses are required depending on the age of the child.

Vaccine Type	Minimum Number of Doses Required Per Age						
	2-3 Months	4-5 Months	6-7 Months	8-11 Months	12-17 Months	18-24 Months	4-6 Years
MMR (Measles-Mumps-Rubella)	0	0	0	0	1	1	2

What is Herpes Zoster (Shingles)

- Caused by the Varicella zoster virus that also causes chickenpox
 - After a person recovers from chickenpox, the virus remains in the body in an inactive state.
 - It is not fully understood why the virus reactivates years later causing shingles.
- Causes a painful rash on one side of the face or body
- Blisters from the rash typically scab within 7-10 days and clear within 2-4 weeks.
 - Prior to the rash there is pain, tingling, and itching where the rash develops (1-5 days before rash appears).
 - Can have fever, headache, chills, and upset stomach
 - Can affect the eye and cause vision loss
 - For people with already weakened immune systems, the rash can be more widespread and look like chickenpox.

Who is at Risk for Shingles?

- Anyone who has had chickenpox
- More than half of cases are in people over 60 years
 - More than 1/3 of those who get shingles will develop serious complications, risk rises even more after age 60

Shingles Vaccine

- Recommended by the ACIP in 2006 to reduce risk of shingles and associated pain in adults over 60
 - The CDC at this time does not have recommendations for routine use in patients between 50-59 years of age.
 - The FDA has approved shingles vaccine for people in the 50-59 years age group.
 - It is currently only approved for a one time dose
- Shingles vaccine should be frozen until it is reconstituted for injection.
 - Diluent is not interchangeable
 - Vaccine must be used within 30 minutes of reconstitution



Who Should get the Shingles Vaccine?

- There is no need to screen for history of chickenpox infection.
- Anyone who is 60 years or older
- An unknown history of disease
- An unknown vaccination history for varicella zoster
- A history of shingles should be vaccinated
 - The CDC recommends waiting until the rash is entirely healed, approximately 6-12 months.

Who should not get Shingles Vaccine?

- Anyone that has ever had severe allergic reactions to gelatin, neomycin, or any other shingles vaccine component.
- A person with weakened immune system from:
 - HIV/AIDS or disease affecting the immune system
 - Treatment with drugs that affect the Immune system, i.e., Steroids
 - People undergoing chemo or radiation
 - People who have cancer affecting bone marrow or lymphatic system
 - Women who are or may be pregnant

Shingles vaccine side effects

- Tested in 20,000 people 60 years and older
- Redness, soreness, swelling, or itching at injection site and head ache
- It **IS** safe to be around infants, young children, pregnant women, or people with weakened immune systems after you receive the vaccine.
 - There is no documentation that any person has developed chickenpox or shingles from someone who received the vaccine containing varicella zoster virus



Can Shingles Vaccine Cause Chickenpox or Shingles?

- There are no indications to avoid pregnant women and children that have not received varicella vaccine
 - If a rash develops after vaccination, the rash should remain covered
 - If a person who has never had chickenpox or varicella vaccine comes in direct contact with a shingles rash the virus could be transmitted and cause chickenpox, not shingles.
 - Shingles can not be passed through sneezing, coughing or casual contact

Rotavirus



- Spreads among young children before and after they are sick with diarrhea symptoms
- Additional child symptoms are fever, vomiting and abdominal pain
- Can be spread by contaminated hands, objects, food, and water
- Spreads via fecal-oral route
- Most cases occur between December and June

Who is at risk for Rotavirus?

- Young children
- Adults who care for children
- Older adults
- Adults that are traveling



Rotavirus Vaccine

- Two vaccines available: Rotarix and Rotateq
 - Rotarix is a two dose series
 - Rotateq is a three dose series
 - First dose can be given as early as 6 weeks of age
 - Second dose at 4 months of age or separated by an 8 week interval
 - And third dose if applicable 8 weeks after the second.
 - All doses must be given by 8 months of age
 - If a child received Rotateq or an unknown brand for the 1st or 2nd dose in a series, third dose must be administered
 - If the series is not completed by 8 months it should not be continued
- *Both brands of rotavirus vaccine are available through the VFC Program for VFC-eligible infants.

Rotavirus Vaccine Side Effects

- Babies may be irritable
- Mild temporary diarrhea
- Mild temporary vomiting

Influenza



- Respiratory illness caused by influenza virus
- Spread by droplets made when people cough, sneeze or talk
- Can be mild to severe and may lead to death
- Symptoms include fever or feeling feverish with chills, cough, sore throat, runny/stuffy nose, muscle/body aches, fatigue
 - In some cases vomiting and diarrhea occur in children more than adults
- Healthy adults can infect others beginning 1 day before onset of symptoms up to 5-7 days after becoming ill.
- Symptoms begin 1-4 days after the virus is contracted.
- Children may pass the virus for longer than 7 days.

Flu 2011-2012 and 2012-2013

- In the 2011-2012 flu season the U.S. had 22,417 positive specimens and 34 pediatric deaths.
 - North Dakota reported 1,487 cases including 2 pediatric deaths.
- In the 2012-2013 flu season so far the U.S. has over 51,000 positive specimens and 45 pediatric deaths so far.
 - North Dakota has reported 3,158 cases so far and no pediatric deaths.

Who is at risk?

- Everyone is at risk for seasonal influenza.
- Elderly people over 65 years, anyone with chronic medical conditions, pregnant women and young children are at increased risk for complications if they contract the flu.
- One study found that 17,000 in the mildest season up to 52,000 in the most severe season of the 1990's died from flu-related deaths in the U.S.
 - Approximately 90% of flu-related deaths are reported in adults over 65 years

Live Attenuated Influenza Vaccine (LAIV)

- The live flu vaccine is a nasal spray approved for use in healthy people 2 years- 49 years that are not pregnant.
- In children, a study found FluMist® reduces the chance of influenza illness by 92%. Adults were not included in the study.
- In a study for possible side-effects in children receiving LAIV versus a placebo group found that there were:
 - 19% fewer severe febrile respiratory tract illnesses
 - 24% fewer respiratory tract illnesses with fever
 - 23-27% fewer days of illness
 - 13-28% fewer lost work days
 - 15-41% fewer health care provider visits and
 - 43-47% less use of antibiotics



Who should NOT get LAIV?

- People less than 2 years of age
- People 50 years of age and over
- Pregnant women
- Children or adolescents on aspirin regimens
- Children under 5 years with a history of recurrent wheezing
- People with medical conditions that make them high risk for complications from influenza
- People with severe chicken egg allergy causing anaphylaxis
- People with a history of Guillain-Barre Syndrome
- People receiving antivirals like Tamiflu should not get LAIV until 48 hours after the last dose of the influenza antiviral
- **Healthcare personnel that work with patients that have severely weakened immune systems should not receive LAIV.**
 *(people with hematopoietic stem cell transplants or are so immunosuppressed that they must be in a protective barrier)

Side Effects of LAIV

- In studies, it was rare for a close contact to someone receiving LAIV to become ill with influenza.
 - In children: runny nose, headache, wheezing, vomiting, muscle aches, and fever
 - In adults: runny nose, head ache, sore throat, and cough. Fever is not common in adults receiving LAIV



LAIV and the VFC Program

- FluMist® is available for VFC eligible children when pre-booking begins.
- Be sure to encourage early immunization with FluMist® to prevent expiration of the flu vaccine.
- It can be administered to any VFC eligible child between 2 and 18 years of age.
- Insured children receiving vaccines at universal LPHU's can receive state supplied FluMist® .

Quadrivalent FluMist®

- In 2013, FluMist® will only be available in Quadrivalent rather than Trivalent form.
 - Two strains of A and B Influenza will be included in the formula
 - Previously, two strains of Influenza A and one strain of Influenza B were contained in trivalent flu vaccine.
 - The trivalent vaccine was only providing protection for one B strain
 - The quadrivalent vaccine will increase the likelihood of adequate protection against two A and two B strains
- The Quadrivalent dose has the same precautions and contraindications as trivalent FluMist® .
- It is available for the same age group and population of healthy 2-49 year olds.

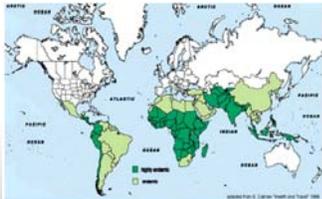
Typhoid Fever

- Life-threatening febrile illness caused by bacterium Salmonella enterica serotype Typhi
- It is transmitted through consumption of food or water contaminated by feces of an infected person or carrier.
 - Causes high (103°F-104°F) fever, stomach pain, headache, loss of appetite, and rash
- An estimated 22 million cases of typhoid fever and 200,000 related deaths occur worldwide annually.
 - 400 cases of typhoid fever are reported in the U.S. annually, often in people that recently traveled to high risk destinations.



Who is at risk for Typhoid?

- People who travel to high risk destinations
 - Includes Southern Asia, Africa, the Caribbean, Central and South America
 - Southern Asia has the highest risk for travelers (30-60 times higher than all other destinations)



Typhoid Vaccine

- This is not a routinely recommended vaccine and is administered only to people traveling to at risk areas.
 - There are 2 vaccines available
 - Oral Ty21a is four capsules of live attenuated virus, 1 taken every other day and should be kept refrigerated and completed at least one week prior to travel
 - A booster dose is needed every five years for people who remain at risk
 - Not for children under six years or pregnant women
 - ViCPS is one 0.5mL dose on inactivated typhoid vaccine, administered intramuscularly and should be given at least two weeks prior to travel
 - A booster dose is needed every 2 years for people who remain at risk
 - Not for children under 2 years

*Either presentation may be given at the same time as all other vaccines

Typhoid Fever Schedule

Table 3-20. Dosage and schedule for typhoid fever vaccination

VACCINATION	AGE (y)	DOSE/MODE OF ADMINISTRATION	NUMBER OF DOSES	DOSING INTERVAL	BOOSTING INTERVAL
Oral, Live, Attenuated Ty21a Vaccine (Vivotif)¹					
Primary series	≥6	1 capsule, ² oral	4	48 hours	Not applicable
Booster	≥6	1 capsule, ² oral	4	48 hours	Every 5 years
Vi Capsular Polysaccharide Vaccine (Typhim Vi)					
Primary series	≥2	0.50 mL intramuscular	1	Not applicable	Not applicable
Booster	≥2	0.50 mL intramuscular	1	Not applicable	Every 2 years

¹ The vaccine must be kept refrigerated (35.6°F–46.4°F, 2° C–8°C).
² Administer with cool liquid no warmer than 98.6°F (37°C).

Side Effects of Typhoid Vaccine

- Abdominal discomfort, nausea, vomiting, and rash are rare side effects of Ty21a- (Live Vaccine)
- Headache and injection site reactions are rare side effects from (ViCPS injectable vaccine)
- Ty21A Live Vaccine should not be administered to immunocompromised travelers or pregnant women.
 - Instead ViCPS is theoretically a safer alternative for the contraindicated group for the live Typhoid vaccine

Yellow Fever (Flavivirus)



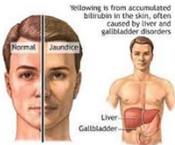
- Transmitted through bite of an infected mosquito
 - Endemic in sub-Saharan Africa and tropical South America
- First symptoms include fever, chills, severe headache, back pain, nausea, vomiting, fatigue, and weakness
- Some cases (15%) after a brief remission develop severe symptoms
 - Causes high (103°F-104°F) fever, stomach pain, headache, loss of appetite, rash
 - Jaundice, bleeding, shock and multiple organ failure
- An estimated 200,000 cases of yellow fever and 30,000 related deaths occur worldwide annually.
 - 9 cases have been reported in the U.S. since 1970 in unvaccinated travelers. Only 1 survived and only 1 case has been reported in a vaccinated traveler who experienced a mild case.

Yellow Fever Vaccine

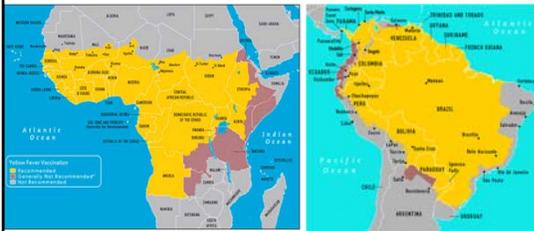
- Live, weakened virus administered in a one dose injection
- Should be boosted every 10 years for people who remain at risk
- For people nine months through 59 years who travel to or live in areas where yellow fever is known to exist or requires vaccine for entrance

Who is at risk for Yellow Fever?

- People traveling to endemic areas and spending much of their time outside
- People traveling that are contraindicated for the vaccine
 - People with AIDS
 - People with a thymus disorder
 - People with malignant neoplasms, immunodeficiencies



Recommendations for Yellow Fever Vaccine



Who Should Not Get Yellow Fever Vaccine

- Anyone with severe allergy to any vaccine component including:
 - Eggs
 - Chicken proteins
 - Gelatin
- Infants younger than six months
- Adults 60 years of age and older unless approved by physicians
- Pregnant women

NDIIS Data

- According to NDIIS, there are currently **2,359** doses marked as invalid because of minimum interval between live vaccine violations.
 - Many of these occur in children receiving their MMR and Varicella and FluMist® vaccine too close together.
 - FluMist® can be given at the same time as MMR and Varicella and may be a helpful way to increase flu vaccination rates while using FluMist® before it expires. Studies show one calendar year of protection.
 - It is encouraged to begin vaccinating as soon as it is available

Live Vaccine and Antivirals

- Antiviral drugs that are active against influenza A and/or B viruses may reduce the effectiveness of FluMist® if administered within 48 hours before, or within 2 weeks after vaccination.
- There are theoretical concerns about immunogenicity of live, attenuated Ty21a vaccine in people currently receiving antimicrobials, viral vaccines, or immune globulin.
 - Vaccination with Ty21a should be delayed until greater than 72 hours after administration of any antibacterial agent.

Live Vaccine and Antibodies

- Live vaccine must replicate to cause an immune response. Antibody against injected live vaccine antigen may interfere with replication. If a live injectable vaccine (MMR, varicella or MMRV) must be given around the time antibody is given, the two must be separated by enough time so that the antibody does not interfere with viral replication.
- If live vaccine is given first, it is necessary to wait at least 2 weeks before giving antibody.
- If the antibody is given before a dose of MMR or varicella vaccine, it is necessary to wait until the antibody has waned before giving vaccine to reduce the chance of interference by the antibody.
 - Minimum interval depends on the concentration of the antibody but is always a minimum of 3 months.
 - Zoster, oral typhoid and rotavirus vaccines are not known to be affected by circulating antibody and can be given anytime before or after receipt of an antibody-containing blood product.

Live Vaccines and Contraindicated Close Contacts

- MMR and varicella containing vaccines can be given to healthy children or adults when living in a household with pregnant women or immunosuppressed individuals.
 - Transmission of disease from the vaccine is rare but may occur if the recipient develops a rash after vaccination.
 - The risk of developing the disease naturally outweighs the risk of vaccinating.
- LAIV can be administered to healthy individuals who share a home with a pregnant woman or immunosuppressed person unless the person is severely immunosuppressed in which case inactivated influenza vaccine should be given, this includes healthcare personnel that work closely with severely immunosuppressed patients.
 - Work in bone marrow transplant units or with patients in special environments because of profound immunosuppression
- All other live vaccines can be given when the individual shares a home or works closely with pregnant women or immunosuppressed people.

Type your question in the chat window to the right

This presentation will be posted to our website:
www.ndhealth.gov/immunize

After the presentation, questions may be sent to:

- Molly Howell mahowell@nd.gov
- Abbi Pierce apierce@nd.gov
- Mary Woinarowicz marywoinarowicz@nd.gov
- Amy Schwartz amschwartz@nd.gov
- Janna Pastir jpastir@nd.gov
- Stacy Lovelace slovelace@nd.gov
- Rahel Gemmeda rgemmeda@nd.gov

For any immunization questions, call 701-328-3386 for the Immunization Program



Post-test



- Post-test
 - Nurses interested in continuing education credit, visit www.ndhealth.gov/immunize/posttest/
 - Successfully complete the five-question post-test to receive your certificate
- Credit for this session available until
5pm Wednesday, February 20th