Introduction to Vaccines

IHS Immunization Program
Objectives

• Learn about Disease
• Understand how a vaccine works
• Learn about Immunity and Herd Immunity
• Know who needs vaccines
• Become familiar with common vaccine questions and answers
• Learn the role of CHRs in vaccine education
Disease
What is a disease?

• Changes to the normal functioning of your body
• Has certain signs and symptoms

• Caused by
  • The environment
  • Germs
  • Genes
**Chronic Disease**

- A disease that lasts for a long time
- *Cannot be spread from person to person*
- **Examples**
  - Heart Disease
  - Arthritis
  - Cancer
  - Obesity
  - Diabetes

**Infectious Disease**

- *Can be spread*
  - Directly from person to person
    - Coughing, sneezing, blood contact, mother to baby
  - Indirectly from an infected person to the environment
    - Toys, door handles, bedding and toilets
  - Animal/insect to person
- **Examples**
  - Flu
  - Measles
  - Pertussis (Whooping cough)
What is a vaccine preventable disease (VPD)?

A vaccine preventable disease is an infectious disease for which an effective vaccine exists.

Examples of VPDs

- Anthrax
- Cervical Cancer (HPV)
- Diptheria
- Hepatitis A
- Hepatitis B
- Haemophilus influenza type b (Hib)
- Human Papillomavirus (HPV)
- Influenza (Flu)
- Japanese encephalitis (JE)
- Measles
- Meningococcal
- Mumps
- Pertussis
- Pneumococcal
- Polio
- Rabies
- Rotavirus
- Rubella
- Shingles (Herpes Zoster)
- Smallpox
- Tetanus
- Typhoid
- Tuberculosis (TB)
- Varicella (Chickenpox)
- Yellow Fever
How does a vaccine work?
Vaccine Basics

• Vaccines contain the same germs that cause disease
  • Germs are either weakened or killed so they can’t make you sick. Some vaccines contain only a part of the disease germ.

• You cannot get the disease from the vaccine

• Vaccines help your body make antibodies
  • Antibodies act as guards and protect you from getting sick in the future
What is a vaccine and how does it work?

1. A weakened or killed form of the germ that causes the disease is injected into the body.

2. The body creates antibodies to fight the germs.

3. If the real germs ever attack the body, the antibodies recognize them and destroy them.
Immunity

What is it and how do we get it?
What is immunity?

• Protection from disease and infection
• The body’s defense against germs
• NOVA PBS video: Immunity and Vaccines Explained
  • https://youtu.be/pOzWoetMkqQ
How do you get immunity?

- Vaccine
- Mom → Baby
  - Pregnancy
  - Breast feeding
- Get the disease
  - Only some diseases and may not provide long lasting immunity
  - You cannot become immune to some diseases, like flu
    - If you get the flu one year, you can get it the next year
Herd Immunity Activity
Herd Immunity: No One Immunized

Contagious disease spreads throughout the community.
Herd Immunity: Some People Immunized

Contagious disease spreads throughout the community
Herd Immunity: Most People Immunized

Contagious disease spreads throughout the community
Who do we protect when we get immunized?

Everyone!
Story about whooping cough

http://www.shotbyshot.org/stories/ramonas-story-video/
Why do we need vaccines?
VACCINES WORK

These bubbles are sized according to the annual number of disease cases in the US during the 1900s versus 2010. We’ve come so far. It’s a reminder that while disease rates are low, most diseases haven’t disappeared. This is why we continue to vaccinate.

THEN
Annual US disease cases in the 1900s

SMALLPOX
THEN 29,005
NOW 0

DIPHTHERIA
THEN 21,053
NOW 0

PERTUSSIS
THEN 200,752
NOW 21,291

TETANUS
THEN 580
NOW 8

POLIO
THEN 16,316
NOW 0

MEASLES
THEN 530,217
NOW 61

MUMPS
THEN 162,344
NOW 2,528

RUBEOLA
THEN 47,745
NOW 6

PERSISTENT INFECTIOUS DISEASES
HAEMOPHILUS INFLuenzaE
THEN 20,000 (est.)
NOW 270


I never see these diseases anymore. Are they still around?

• Yes

• Some VPDs are still common in the US
  • Chickenpox, whooping cough, HPV
  • Some parents choose not to vaccinate their children
  • Leaves many children and adults vulnerable to VPDs
Many VPDs are still common in other parts of the world.

Someone traveling to the U.S. from another country could spread the disease if no one is vaccinated.

A few cases could become tens or hundreds or thousands if we stop vaccinating.

- 147 cases of measles
- Majority of patients were unvaccinated or had an unknown vaccination status
Why vaccinate?

• Vaccines PREVENT Disease
• Diseases have not disappeared
• We need to keep immunizing until the disease is eradicated, or completely gone EVERYWHERE
  • Only one VPD, smallpox, has been completely eradicated
• By getting vaccinated, we can protect ourselves AND others around us
Who needs vaccines?
Everyone Needs Vaccines

• Babies
• Children
• Adolescents
• Adults
  • Including healthy adults
• Elders
• Pregnant Women
• Children and Adults with certain health conditions
Vaccine Schedules

• There is a recommended vaccine schedule for every age group

• The schedule includes
  • Timing of all recommended vaccines
  • Number of vaccine doses recommended
Healthcare Personnel (HCP)

• HCP is anyone that works in or with a healthcare facility
  • CHRs - in contact with vulnerable patients

• Certain vaccines are recommended for HCP
  • Flu (every year)
  • There may be other vaccines you need

• By getting vaccinated you protect yourself AND your patients
Common Vaccine Questions
and How to answer them
Are vaccines safe?

• YES! Vaccines are safe.

• Like all medications, there may be side effects.
  • Most side effects are minor and go away within a few days
    • Ex. Low grade fever or sore arm
  • Serious side effects are very rare

• There are systems to monitor vaccine safety
  • Doctors, nurses and patients can report any side effects experienced after receiving a vaccine
Do vaccines cause autism?

• **NO**

• There is no a link between Autism Spectrum Disorder (ASD) and vaccines

• Vaccine ingredients do not cause autism
  
  • Thimerosal is a preservative used in some vaccines
    • Used to prevent contamination in multidose vaccines

  • The type of mercury in thimerosal is different than the type of mercury contained in fish that can cause damage at high levels

  • There is no link between thimerosal and autism
Is it okay to receive multiple vaccines during the same visit?

• YES!

• The vaccine schedule is designed to provide maximum protection
  • Babies most at risk

• Everyone should get all their shots according to the recommended schedule
  • Ensures protection from the diseases as soon as possible
  • It is safe to get multiple vaccines during the same visit
I am healthy so I don’t need any vaccines, right?

Even if you are healthy, you still need vaccines! Ask your healthcare provider about which ones are right for you.
Why do I always get sick after I get a vaccine?

You cannot get the disease from the vaccine. But your body is going through the process of creating antibodies (the guards that protect you). This process may make you feel a little sick, but it is better than getting the actual disease!
The Role of CHRs
The Role of CHRs

- Educate your patient/clients on the importance of vaccines
- Encourage them to talk with a healthcare provider about which vaccines they may need

- Be an example! Make sure you have received all your recommended vaccines
Evaluation of materials
Flu vaccine PSA

- https://youtu.be/TN77u-KXZZzY
Adult Immunization PSA

• https://www.youtube.com/watch?v=ZUxP6D7PbvQ&feature=youtu.be
Companion Materials for CHRs

Vaccine Basics

Adult Vaccine Basics

How do vaccines prevent diseases?

Vaccines work with your body to safely develop immunity, or protect against disease, without making you sick. Vaccines help your body make antibodies. Antibodies are proteins that protect you from getting sick in the future. The antibodies are normally on the lookout for and fight germs. If they come across a pathogen similar to the strain for your body to go on the defense and attack the pathogen right away. So when the real germ shows up, your body will recognize and attack a pathogen of protection (immunity).

Here’s how it works:

1. When a living form of the germ that causes disease is injected into the body, the body’s immune system recognizes the germ.

2. The body makes antibodies to fight the weakened germ.

3. If a live germ ever attacks the body, the antibodies are there to destroy it.

Why do adults need vaccines?

• Some adults may never have been vaccinated as children.
• Certain vaccines were not available when some adults were children.
• The protection against disease caused by vaccines (immunity) can begin to fade over time.
• As we age, we become more likely to get certain diseases caused by common infections like the flu.
• Vaccines help prevent the spread of disease to other people.

Are vaccines safe?

Yes. Vaccines are one of the safest ways to protect your health.

Some adults may be able to get certain vaccines due to preexisting health conditions. Check with your doctor or other provider about which vaccines are right for you.

Can you get sick from a vaccine?

You can get mild side effects, such as a fever, from the vaccine. These symptoms are a normal part of the body’s process of building immunity and are typically brief and temporary. They are less severe than getting the real disease, or spreading the disease to others who may be more vulnerable like babies too young to get vaccinated.

What are the possible side effects of vaccines?

Like any medication, vaccines can cause side effects. The most common are mild and go away within a few days. Severe side effects following vaccines, which are extremely rare, due to an allergic reaction, are very rare, and doctors and health officials are trained to deal with them.

Can vaccines cause autism?

There is no link between vaccines and autism. Vaccine ingredients do not cause autism.

For more information, visit: http://www.cdc.gov/vaccinesafety/events-autism.html
# Companion Materials for CHRs
## Adult Vaccine Guide

### Vaccines for Adults

<table>
<thead>
<tr>
<th>Vaccine Type</th>
<th>Who</th>
<th>When</th>
<th>Why</th>
<th>Harvestable if used?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu Vaccine</td>
<td>Everyone</td>
<td>Every year</td>
<td>Influenza affects many adults and can cause serious health problems. It is important to stay up to date with the flu vaccine.</td>
<td>Yes and Influenza A (H1N1) virus can be harvested</td>
</tr>
<tr>
<td>HPV Vaccine</td>
<td>Women 18 years and older</td>
<td>2 doses at 0-6 months</td>
<td>HPV is a virus that can cause cervical cancer and other cancers. It is important to get the HPV vaccine.</td>
<td>Yes and HPV can be harvested</td>
</tr>
<tr>
<td>Hepatitis A Vaccine</td>
<td>Adults 1 year old and older</td>
<td>2 doses at 1 year old</td>
<td>Hepatitis A is a virus that can cause liver damage. It is important to get the Hepatitis A vaccine.</td>
<td>Yes and Hepatitis A virus can be harvested</td>
</tr>
<tr>
<td>Hepatitis B Vaccine</td>
<td>Adults 1 year old and older</td>
<td>2 doses at 1 year old</td>
<td>Hepatitis B is a virus that can cause liver damage. It is important to get the Hepatitis B vaccine.</td>
<td>Yes and Hepatitis B virus can be harvested</td>
</tr>
</tbody>
</table>

### Vaccine Administration

- **Influenza A**:
  - **Adults**: 2 doses at 1 year old
  - **Teenagers**: 2 doses at 1 year old

- **Hepatitis A**:
  - **Adults**: 2 doses at 1 year old

- **Hepatitis B**:
  - **Adults**: 2 doses at 1 year old

### Vaccine Precautions

- **Influenza A**:
  - Do not use if you are allergic to eggs.

- **Hepatitis A**:
  - Do not use if you are allergic to eggs.

- **Hepatitis B**:
  - Do not use if you are allergic to eggs.

### Vaccine Side Effects

- **Influenza A**:
  - Common: Headache, fever, muscle aches, fatigue.

- **Hepatitis A**:
  - Common: Fatigue, headache, fever, nausea, vomiting.

- **Hepatitis B**:
  - Common: Fatigue, headache, fever, muscle aches, joint pain.

### Vaccine Costs

- **Influenza A**:
  - Cost: $50

- **Hepatitis A**:
  - Cost: $75

- **Hepatitis B**:
  - Cost: $100

### Vaccine Administration Sites

- **Influenza A**:
  - Sites: Local clinics, health centers, pharmacies.

- **Hepatitis A**:
  - Sites: Local clinics, health centers, pharmacies.

- **Hepatitis B**:
  - Sites: Local clinics, health centers, pharmacies.

### Vaccine Storage

- **Influenza A**:
  - Store at 2-8°C (36-46°F).

- **Hepatitis A**:
  - Store at 2-8°C (36-46°F).

- **Hepatitis B**:
  - Store at 2-8°C (36-46°F).

### Vaccine Disposal

- **Influenza A**:
  - Disposal: Sharps container.

- **Hepatitis A**:
  - Disposal: Sharps container.

- **Hepatitis B**:
  - Disposal: Sharps container.

### Vaccine Safety

- **Influenza A**:
  - Safety: Use caution when handling live vaccines.

- **Hepatitis A**:
  - Safety: Use caution when handling live vaccines.

- **Hepatitis B**:
  - Safety: Use caution when handling live vaccines.

### Vaccine Effectiveness

- **Influenza A**:
  - Effectiveness: 90% for prevention of hospitalization.

- **Hepatitis A**:
  - Effectiveness: 80% for prevention of hospitalization.

- **Hepatitis B**:
  - Effectiveness: 85% for prevention of hospitalization.
Community Educational Materials

• Video PSAs, Radio PSA, posters, companion material, vaccine card

• Visit Great Plains Tribal Chairman’s Health Board website

• Resources → Infectious Disease → National Vaccination Project
Resources

• Immunization Schedules
  • http://www.cdc.gov/vaccines/schedules/index.html

• Immunization Action Coalition
  • www.immunize.org

• Stories from people who have experienced vaccine-preventable diseases
  • http://www.vaccineinformation.org/personal-testimonies/
Thank You!

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