Region VII

Emergency Medical Services

South Cook County EMS

Vaccinations

February 2021

IDPH Site Code: 070400E1221

Objectives:

Upon completion, the participant will be able to:

1. Compare and contract natural and acquired immunity
2. List the various vaccine types
3. Discuss vaccine administration
4. Discuss screening parameters
5. Discuss Covid 19 vaccine, to include storage, administration and pathophysiology.

This ppt is NOT to be construed as an educational tool for allowing paramedics to administer the vaccine.

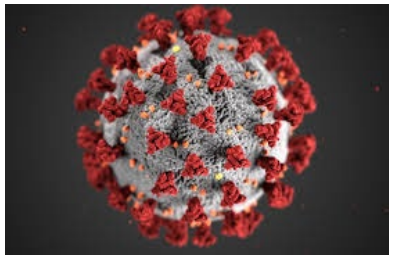
Immune System Review

- Natural Immunity
  - Physical Barriers
    - Skin, Mucous Membranes, Cilia.
  - Chemical Barriers
    - Gastric Juices, Enzymes, Sweat.
  - Inflammatory Response
- Acquired Immunity
  - Active
    - Develop as a result of exposure.
    - Covid 19- no one has immunity
  - Passive
    - Temporary transfer of immunity from another source.
    - At birth from placenta to baby

Vaccines Types

- Inactivated-Dead (TIV) “flu shot”
  - Original Salk polio
  - Influenza
- Attenuated-Live (LAIV)
  - Sabin oral polio
  - MMR (measles, mumps, rubella)
  - Influenza (nasal spray)
- Subunit-Multiple Vaccines in one shot
  - DPT (diphtheria, pertussis, tetanus)
- Recombinant-Man Made in a lab
  - Hepatitis B

Covid 19 vaccine:



Type: mRNA

What are mRNA vaccines?

The mRNA gives instructions for our cells to make a harmless piece of what is called the “spike protein.” The spike protein is found on the surface of the virus that causes COVID 19.

Next, the cell displays the protein piece on its surface. Our immune systems recognize that the protein doesn’t belong there and begins building an immune response and making antibodies, like what happens in natural infection against C19.

At the end of the process, our bodies have learned how to protect against future infection. The benefit of mRNA vaccines, like all vaccines, is those vaccinated gain this protection without ever having to risk the serious consequences of getting sick with Covid 19.

mRNA continued

There are currently no licensed mRNA vaccines in the US. However, researchers have been studying and working with them for decades. Interest has grown in these vaccines because they can be developed in a lab using readily available materials. This means the process can be standardized and scaled up, making vaccine development faster than traditional methods of making vaccines.

mRNA vaccines have been studied before for flu, Zika, rabies, and cytomegalovirus (CMV). As soon as the necessary info about the virus that causes Covid 19 was available, scientists began designing the mRNA instructions for cells to build the unique protein into an mRNA vaccine.

Common Vaccines

- Childhood
  - Hepatitis A / B
  - Diphtheria, Tetanus, Pertussis (DPT)
  - Polio
  - Measles, Mumps, Rubella (MMR)
  - Influenza
  - Varicella
  - Pneumococcal
  - Meningococcal
- Adult
  - Hepatitis A / B
  - Tetanus, Diphtheria (Td)
  - Varicella
  - Influenza
  - Pneumococcal
  - Meningococcal
  - Shingles

Event Specific Vaccines

- Bioterrorism
  - Smallpox
- Disasters
  - Tetanus
  - Hepatitis
  - Cholera
- Outbreaks / Epidemics/Pandemics
  - Pertussis
  - Influenza-Seasonal & H1N1 (Swine Flu)
  - Meningitis
  - Covid 19

Administration Review

- Now 6-Rights
  - Patient
  - Drug
  - Dose
  - Route
  - Time
  - ***Documentation***
- Asepsis and Body Substance Isolation

Intramuscular Vaccines

- Influenza
- Hepatitis A
- Hepatitis B
- Tetanus
- Covid 19

Influenza

- Contagious respiratory illness caused by the influenza virus.
- From the CDC:
  - 5-20% of the population get the flu each year;
  - More than 200,000 people are hospitalized from complications; and
  - About 36,000 people die from flu.

Symptoms and Complications (Flu)

- **Symptoms**
  - Fever
  - Headache
  - Extreme tiredness
  - Dry cough
  - Sore throat
  - Runny or stuffy nose
  - Muscle aches
  - Stomach symptoms

- **Complications**
  - Bacterial pneumonia
  - Ear infections
  - Sinus infections
  - Dehydration
  - Worsening of chronic medical conditions:
    - CHF
    - Asthma
    - Diabetes

Influenza Vaccine and screening guidelines

- Injection

"Inactivated vaccine" meaning killed virus.

- People who live with or care for infants younger than 6 months of age
- Health care and emergency medical personnel
- Anyone from 6 mo through 24 yr.
- Anyone from 25 through 64 yr with certain chronic medical conditions or weakened immune system.

Influenza Vaccine

- Most frequent side effect is soreness at the injection site that lasts up to 2 days
- Immediate hypersensitivity reactions are rare
- Takes 2 weeks to develop antibodies

People Who Should Not Receive Influenza Vaccine

- People who have severe allergies to **chicken eggs**;
- People who have had severe reactions to influenza vaccination in the past;
- People who have developed Guillain-Barre Syndrome within 6 weeks of getting an illness;
- Children less than 6 months of age
- People who have moderate or severe illness with a fever.
- Adults/Legal Guardians that refuse

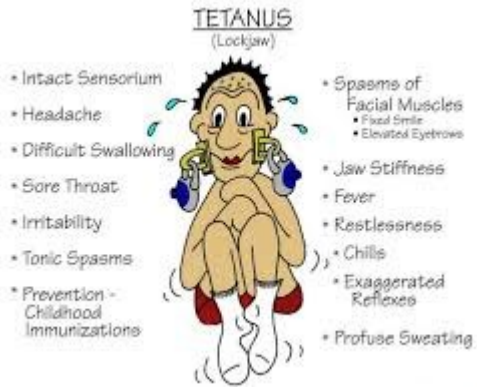
Tetanus

- Nervous disease caused by toxins produced by the bacteria *Clostridium tetani.*
- Often referred to as “lockjaw” from the symptom.
- Enters the body through breaks in the skin.
- Death in 10-20% of cases, higher among older people.
- *Clostridium tetani* can be found almost everywhere (soil, mud, intestinal tracts of animals)

Symptoms and Complications (Tetanus)

- Symptoms (Early)
  - Lockjaw
  - Stiffness in the neck and abdomen
  - Difficulty swallowing.
- Symptoms (Late)
  - Severe muscle spasms
  - Generalized tonic seizure-like activity
  - Severe autonomic nervous system disorders.

- Complications
  - Breathing compromises
  - Blood pressure changes
  - Abnormal heartbeats
  - Clotting
  - Fractures
  - Pneumonia
  - Coma
  - Death



Tetanus Vaccine

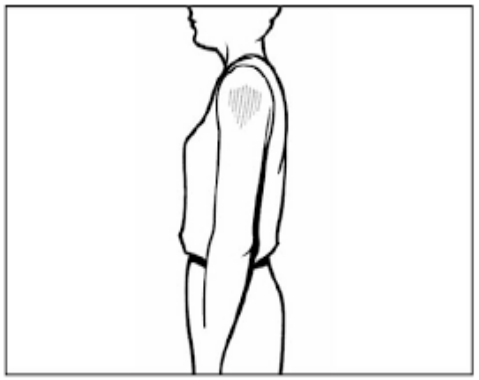
- Injection
  - Toxoid (contained in Tdap, DTP, DT, DTaP, and TD vaccines).
  - Subunit vaccine.
- Everyone needs protection.
- TD boosters every 10 years or with increased exposure opportunities (flood water, disaster settings). T-DAP booster every 5 years.

People Who Should Not Receive Tetanus Vaccine

- Children who are moderately or severely ill should wait until they recover.
- Children who had life-threatening allergic reactions from previous vaccinations.
- Children who suffered a brain or nervous system disease within 7 days of a dose should not get another dose.

Vaccination Procedures

- Assess / screen the patient
- Withdraw the appropriate dosage using aseptic technique or utilize single dose prefilled syringe
- Select the injection site (deltoid)
- Cleanse the area
- Administer the injection
- Dispose of the needle
- Monitor the patient for side effects.



Vaccination Procedures

- Document on PCR and/or Vaccination Form
  - Patient Name/Consent
  - Date/Time
  - Route/Site
  - Vaccination and Dose
  - Vaccine manufacturer and Lot number
  - Expiration Date
  - Patient Education provided


NDC 49281-372-15
Influenza
Virus
Vaccine
Fluzone®

Severe Reaction

- Call 911
- Monitor ABCs

Storage/Handling Covid 19 vaccines

- Vaccines must be stored in a secure area
- Proper temperature is required
  - Documentation of temperature is required
- Do not use
  - damaged
  - discolored vials
  - mislabeled vials

Covid 19 Vaccines:

Two drug makers, Pfizer and Moderna have announced promising interim results for their vaccine. However both vaccines must be stored at *very cold (sub zero)* temperatures

Why the "deep freeze" storage?

Vaccines made from mRNA can be made much faster than older vaccines. The problem is that mRNA is easily destroyed. Think of the vaccine as a chocolate bar that melts easily. There are things the drug makers do to protect their C 19 vaccines.

1. Modify the mRNA nucleosides (building block) – they've used modified versions because those are more stable, like changing the chocolate recipe so it is not so 'melty'
2. Use lipid nanoparticles(lipid coating), which is kind of like putting the chocolate in a candy coating so it won't melt.
3. But even with the stabilized building block and lipid coating, the mRNA could still fall apart easily, which is why the vaccine is frozen.
4. This is the same idea as freezing food to keep it from spoiling.

Questions and Answers

What is vaccination?

- Vaccination is a safe and effective way of protecting people against harmful and infectious diseases. Vaccines stimulate your body's natural defenses to build resistance and make your immune system stronger. They cannot cause the disease or put you at risk of its complications. Most vaccines are given by an injection, and some are given orally (by mouth) or sprayed into the nose. COVID-19 vaccines in development are given by injection.

Why is vaccination important?

- Vaccination safely prevents disease and saves lives. Today, there are vaccines available to protect against at least 20 diseases, such as diphtheria, influenza, tetanus, measles, meningitis and pneumonia. All together, these vaccines save the lives of up to 3 million people every year. When we get vaccinated, we aren't just protecting ourselves, but also those around us. Some people, including those who are seriously ill, are advised not to get certain vaccines and depend on the rest of us to get vaccinated to help protect them and reduce the spread of disease.

Q and A (cont'd)

How does a vaccine work?

- Vaccines reduce the risk of getting a disease by working with your body's natural defenses to build protection. When you get a vaccine, your immune system typically responds by:

• Recognizing the invading germ, such as a virus or bacteria.

• Producing antibodies. Antibodies are proteins produced naturally by the immune system to fight disease.

• Remembering the disease and how to fight it. If you are exposed to the germ in the future, your immune system can destroy it before you become unwell.

How do vaccines protect communities?

- When a person gets vaccinated against a disease, their risk of infection is also reduced. That means they're far less likely to transmit the disease to others. As more people in a community get vaccinated, fewer people remain vulnerable to infection, which means there's less possibility of people passing the pathogen from one person to another. Lowering the possibility for a pathogen to circulate in a community protects those who cannot be vaccinated due to other serious health conditions from the disease targeted by the vaccine. This is called "herd immunity."

Q and A (cont'd)

How will it be decided who gets vaccinated first?

- The CDC, in conjunction with the Illinois Department of Public Health (IDPH), is providing guidance on who should receive the COVID-19 vaccine first.
- Based on the current allocation plan, healthcare workers, first responders (patient care related) and nursing home patients will be first to be vaccinated. Healthcare workers have been specifically prioritized by IDPH, particularly those who provide direct patient care to COVID-19 patients and patients under investigation and those who perform or attend aerosol-generating procedures. Others will follow based on the prioritization plan that is developed from the CDC, CDPH and IDPH

Will I be able to choose which vaccine I get (i.e.: Moderna vs. Pfizer?)

- No. Due to limited inventory, people will not be able to select which vaccine they receive.

When should I get my second dose?

- If you receive the Pfizer vaccine, you will need to get a second dose *three* weeks after your first injection. If you receive the Moderna vaccine, you will need to get the second dose *four* weeks after your first injection.

Not taking the second injection could leave you unprotected

Q and A (cont'd)

Will people in my household be able to get the vaccine?

- Not yet. Based on the CDC's Advisory Committee on Immunization Practices guidelines, the first phase of distribution will involve high-risk healthcare workers. The vaccine won't be available to the general public until later. Updates on the federal allocation process, will be widely communicated.

How was the vaccine developed so quickly?

- Typically, it takes years to develop vaccines, assure their safety and efficacy, and then manufacture them on a mass scale. Because of the seriousness of the COVID-19 pandemic, the timeline was accelerated through national and international programs supporting the work of scientists around the globe. The research and development process was accelerated to allow scientists to perform many steps simultaneously rather than sequentially. The federal effort also provided funding to support the work of pharmaceutical companies to begin manufacturing vaccines before they are approved allowing for quick distribution if and when the vaccines earn an FDA authorization.

Q and A (cont'd)

What are the vaccine's side effects?

- All medical treatments have some degree of risk. For vaccines, that risk is typically small. Many vaccines have mild side effects, which usually range from soreness at the site of injection to a slight fever, body aches and a headache. Clinical trials for the COVID-19 vaccine have shown they are 94-95% effective.
- **Pfizer**: Early data from Pfizer's clinical trial showed typical side effects that indicate the vaccine is working, such as redness, fever, fatigue, and chills. In many cases fevers were mild. Side effects were more commonly seen in people between the ages of 18-55 than those who were 65-85. They were also slightly more likely to occur after the second dose. Side effects typically peaked within two days and were completely over within seven days.

- **Moderna**: Early data from Moderna's clinical trial also showed typical mild-to-moderate side effects, such as headaches, fatigue, muscle aches, chills, and injection site pain. The independent board that conducted the interim analysis of Moderna's large-scale trial found severe side effects included fatigue in 9.7% of participants, muscle pain in 8.9%, joint pain in 5.2%, and headache in 4.5%. Reactions typically occurred within 1-2 days of receiving the vaccine and tended to go away quickly. They were all resolved within seven days.

Q and A (cont'd)

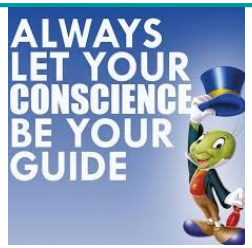
Can I get COVID-19 from the vaccine?

- No. Much like you don't get influenza from a flu shot, it is not possible to get COVID-19 from a COVID-19 vaccine. You may feel unwell after getting vaccinated, and you will not have full protection from the virus until at least 14 days have passed from your second dose.

How long will it take for me be protected from the vaccine?

- How long it takes to gain immunity to the virus will depend on what vaccine you receive. Generally, you should be protected about 14 days after you receive your second dose of the vaccine. The vaccine is not 100% effective, which means there is still a chance you could contract COVID-19. However, researchers believe you may be less likely to get as sick as you would if you were unvaccinated. Keep in mind: **Skipping your second dose (if applicable) could leave you unprotected.**

Q and A (cont'd)



How long will I be protected by the vaccine? Will I need to get vaccinated multiple times over my lifetime?

- We don't know how long immunity to COVID-19 will last. Some vaccines produce a lifetime of immunity but others (like the annual flu shot) require regular immunizations to provide continued protection.

Will I need to wear a mask and follow other restrictions after I get vaccinated?

- Yes. It will take months for the full roll out of the vaccine. People will need to wear masks, practice social distancing, wash their hands, and take other precautions until we've reached herd immunity. That occurs when at least 60% of the population is vaccinated, making it difficult for infectious diseases to spread, because there are not many people who can be infected. Herd immunity works only if most people are vaccinated.

Healthcare workers, first responders have an ethical obligation to receive vaccinations, as appropriate. "Let your conscious be your guide"

Resources

- Center for Disease Control
- Illinois Department of Public Health