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Introduction

Vaccines are a type of biological preparation that provides active acquired immunity to a particular disease. Vaccination involves the introduction of antigens, which stimulate an individual's immune system to develop adaptive immunity to a pathogen.

It is one of the most successful and cost-effective public health interventions ever developed. Vaccination has helped in eliminating or controlling many diseases such as smallpox, measles, and rubella. Vaccines have saved millions of lives around the world and are considered one of the greatest public health successes in history.

Origin and History of Vaccination

The concept of vaccination was first developed by Edward Jenner in 1796 when he discovered that cowpox could be used to immunize patients against smallpox. This was the first successful vaccination in history and he

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went on to develop an effective vaccine against smallpox.

This discovery paved the way for other vaccines to be developed, such as those for diphtheria, tetanus, yellow fever, influenza, and polio. The 20th century saw a huge surge in the development of new vaccines. By the end of the century, there were over 20 different kinds of vaccines available to protect against various diseases.

Purpose of Vaccination

The primary purpose of vaccination is to provide immunity from infectious diseases such as polio, measles, and smallpox. Vaccines are used to reduce the risk of disease among both children and adults. Vaccines can also be used to reduce the spread of disease in a population by increasing herd immunity.

Herd immunity is when a large proportion of people are immune to a particular disease, which helps protect those who are not immune.

Vaccines help create this herd immunity, which can help prevent diseases from spreading and keep them under control.

How a Vaccine Act?

When a vaccine is injected into the body, it stimulates the body's immune system to create antibodies that protect against the disease. The antibodies will recognize and fight off any disease if it tries to enter the body. This helps protect individuals from getting sick and also reduces the spread of disease among members of a population.

Types of Vaccines

There are two main types of vaccines – live and inactivated.

(1) Live vaccines:

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Live vaccines contain live but weakened versions of the virus or bacteria that cause a disease. These include measles, mumps, rubella, and rotavirus vaccines. These vaccines stimulate the body to produce antibodies and create immunity against the disease.

(2) Inactivated vaccines:

Inactivated vaccines contain killed versions of the virus or bacteria that cause a particular disease. These include polio and influenza vaccines. The killed virus or bacteria in these vaccines does not stimulate the body to produce antibodies, but it does protect against the disease.

Importance of Vaccines

Vaccines are an important part of preventative healthcare and should be available to people from all walks of life. Vaccinating against disease can reduce the risk of outbreaks, save lives, and protect the most vulnerable members of society from illness. Vaccines are also cost-effective, as they prevent diseases that would otherwise require costly treatments and healthcare services.

Finally, vaccines help protect future generations from diseases that could cause serious harm or even death if left unaddressed. Vaccination is a safe and effective way to protect our children from serious illnesses that have plagued generations before us. Vaccines are an incredible public health success story and should continue to be widely available to protect individuals, families, and communities from serious diseases.

Some Common Diseases and Their Vaccines

1. Diphtheria:

A bacterial infection of the throat, nose, and tonsils can cause breathing

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difficulties and heart problems. Vaccine - DTaP

2. Polio:

A virus that causes paralysis and can be fatal. Vaccine - IPV

3. Measles:

A viral infection of the respiratory system can cause fever, rash, and pneumonia. Vaccine - MMR

4. Mumps:

A virus that causes fever, headache, and swollen glands. Vaccine - MMR

5. Pertussis (Whooping Cough):

A bacterial infection of the lungs and airways causes severe coughing spells. Vaccine - DTaP

6. Rubella:

A viral infection can cause birth defects if contracted during pregnancy.

Vaccine - MMR

7. Tetanus:

A bacterial infection of the nervous system causes muscle spasms and can be fatal. Vaccine - DTaP

8. Hepatitis B:

A virus that affects the liver and can cause liver damage. Vaccine - HepB

9. Varicella (Chickenpox):

A virus that causes fever, rash, and itching. Vaccine - VAR

10. Influenza:

A virus that causes fever, cough, sore throat, and body aches. Vaccine - Flu Vaccines are one of the greatest public health successes and have saved

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countless lives. It is important to be aware of the diseases that can be prevented through vaccination and the vaccines available to protect against them.

Advantages of Vaccines

- (1) Vaccines are an effective way to protect against illnesses caused by viruses and bacteria.
- (2) Vaccines can prevent outbreaks of diseases and help contain their spread.
- (3) Vaccines reduce the severity of illnesses that do occur, making it less likely that individuals will require hospitalization or have long-term complications from the disease.
- (4) Vaccines can be a cost-effective way to prevent diseases as they are less expensive than treating the illnesses that result from them.
- (5) Vaccines protect vulnerable populations such as infants and people with weakened immune systems.
- (6) Vaccination can reduce the risk of transmission of diseases between individuals, families, and communities.
- (7) Vaccines can help protect future generations from diseases that have caused serious harm in the past.

Disadvantages of Vaccines

- (1) Some people may experience side effects from vaccines such as fever, soreness and swelling at the injection site, or nausea.
- (2) Vaccines may not be 100% effective in preventing disease and can sometimes only reduce the severity of illness if it does occur.
- (3) Vaccines are expensive to produce and store, so access can be limited

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in certain areas.

- (4) There is a risk that the virus or bacteria used in a vaccine could mutate over time, making it less effective or even ineffective.
- (5) Vaccines may not be suitable for people with weakened immune systems.

FAQ's

Who discovered the vaccine?

The modern vaccine was discovered by Edward Jenner in 1796.

What are the fundamental concepts of vaccination?

The fundamental concepts of vaccination are to introduce a weakened or inactivated form of a pathogen into the body so that it can stimulate an immune response and provide protection against future infection by that pathogen.

Are there any risks associated with vaccines?

Yes, although the risk of serious side effects is very small, some people may experience minor side effects such as fever, soreness, swelling at the injection site, or nausea.

How effective are vaccines?

Vaccines

What is the main purpose of a vaccine?

The main purpose of a vaccine is to protect people from infectious diseases by stimulating their body's natural immunity. Vaccines use weakened or killed forms of the pathogen that cause the disease to provoke an immune response and build up protection against future exposure.

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What is the conjugate vaccine?

A conjugate vaccine is a combination of two or more different vaccines, which are combined to increase their effectiveness. This type of vaccine is commonly used to protect against diseases such as Haemophilus influenzae type b (Hib), pneumonia, and meningitis.

What is the difference between active and passive immunization?

Active immunization is the process of administering a vaccine to generate an immune response and long-term protection from a particular disease. Passive immunization involves the injection of pre-made antibodies or antigens to provide immediate, temporary protection against certain diseases.

Why is a vaccine important?

Vaccines are important because they can help protect against diseases that can cause serious illness, disability, and even death. Vaccination is a cost-effective way to prevent illnesses and outbreaks of disease and helps to maintain herd immunity among large populations. It also protects vulnerable individuals such as infants or those with weakened immune systems.

Who should not be vaccinated?

Vaccines should not be given to people who have a weakened immune system, are allergic to any of the components in the vaccine, or have had a severe reaction to a previous vaccination. People with certain medical conditions such as HIV/AIDS and cancer may also be advised against receiving certain vaccines.