

## Importance of Immunization

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### INTRODUCTION

**Vaccine:** Suspense of weakened, killed, or fractured microorganisms or toxins or other natural preparation, for the stimulation of the body's immune response against diseases. similar as those consisting of antibodies, lymphocytes, or messenger RNA (mRNA), that is administered through needle injections, but some can be administered by mouth or sprayed into the nose firstly to prevent disease.

**Vaccination:** The act of introducing a vaccine into the body to produce protection from a particular disease.**Immunity:** Protection from an infectious disease. If you are immune to a disease, you can be revealed to it without that's used getting infected.

**Immunization:** A process by which a person becomes defended against a disease through vaccination. This term is frequently used reciprocally with vaccination or inoculation.

### TYPES OF VACCINES:

There are several types of vaccines:

- **Live-attenuated vaccines** use for a weakened form of the germ.
- **Inactivated vaccines** uses a killed interpretation of the germ.
- **Subunit, recombinant, polysaccharide, and conjugate vaccines** use only specific pieces of the germ, such as its protein, sugar, or covering.
- **Toxoid vaccines** that use a toxin (harmful product) made by the germ.
- **mRNA vaccines** use messenger RNA, which gives your cells instructions for how to make a protein (or piece of a protein) of the germ.
- **Viral vector vaccines** use of genetic material, which gives your cells instructions for making a protein of the germ. These vaccines also contain a different, inoffensive virus that helps get the genetic material into your cells.

Vaccines work in different ways, but they all spark an immune response. The immune response is the way your body defends itself against substances it sees as foreign or harmful. These substances include germs that can cause disease.

### Why are vaccines important?

Vaccines are important because they protect you against numerous diseases. These diseases can be veritable significant. So getting immunity from a vaccine is safer than getting immunity by being sick with disease. And for a few vaccines, getting vaccinated can actually give you a better immune response than getting from the disease. But the vaccines don't just protect you. They also protect the people around you through community impunity.

**Are vaccines safe?** Vaccines are safe. They must go through expensive safety testing and evaluation before they are approved in the United States.

**What is a vaccine schedule?** Vaccines or immunization, schedule lists which vaccines are recommended for different areas of people. It also includes who should get the vaccines, how many doses they need, and when they should get them. In the US, the Centers for Disease Control and Prevention (CDC) publishes the vaccine schedule. It is important for both children and adults to get their vaccines according to their schedule. Following the schedule allows them to get the protection from the disease at exactly the right time. CDC sets the immunization schedules based on the ACIP's recommendations. The childhood and adolescent schedules are also approved by the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), and the American College of Obstetricians and Gynecologists. The adult schedule is also approved

by the American Academy of Family Physicians, the American College of Obstetricians and Gynecologists, the American College of Physicians, and the American College of Nurse-Midwives.

**ADVANTAGES:**

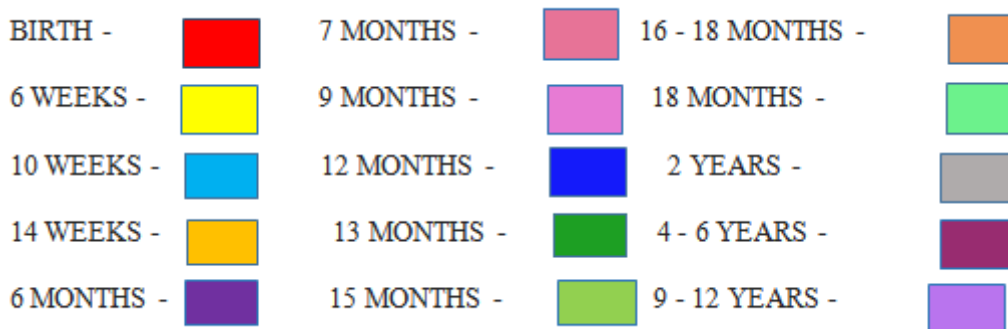
- **Vaccinations are just as important to your overall health as diet and exercise:** Like healthy eating, exercise, and regular check-ups, immunizations play an crucial role in keeping you healthy. Vaccination is one of the most suitable and safest preventive measures available.
- **Vaccine-preventable diseases have not disappeared:** Viruses and bacteria that cause illness and death are still present and can be passed to those who are not defended by vaccines. Despite the fact that many diseases are not common in a particular country, global travel facilitates the spread of disease.
- **Major medical organizations say vaccines are safe:** Major medical organizations such as WHO confirms that vaccines are some of the safest medical devices accessible. The possible side effects of vaccines are rare and far more dangerous than the diseases they prevent.
- **The chances of getting seriously ill or dying from the disease can be much higher than the chances of undergoing serious side effects:** Illness not only has a direct impact on individuals and their

families but also has a high cost to society as a whole, exceeding \$10 billion per year. Vaccines cost less time and money than infectious diseases. Time without work and caring for sick children, potential care for long-term disability, and medical costs.

- **Vaccines protect the herd:** Vaccines not only protect individuals, but they also stop the spread of disease among the people around you and offer the protection to society as a whole. By preparing your body to deal with certain infections, the infectious disease time is significantly reduced, effectively stopping the spread of invading bacteria or viruses. The protection offered by group vaccination of people is called herd or herd immunity.
- Various types of disabilities in children can be avoided by timely immunization and mediation.
- Immunization protects the next generations.
- Immunization saves lives.
- They are safe and effective.
- Prevents related diseases.
- Prevents Auto - Immune disorders.
- Improve Social economic quality.
- Childhood immunization Secure Health and Development.

S.N O	VACCI NE	ROUTE OF ADMINISTRATION	PREVEN TS	AGE OF DOSE -1	FREQ UENC Y BETW EEN DOSE 1 & DOSE 2	FREQU ENCY BETW EEN DOSE 2 &DOSE 3	FREQ UENC Y BETW EEN DOSE 3 & DOSE 4	FREQ UENC Y BETW EEN DOSE 4 & DOSE 5	BOOST ER DOSE 1	BOOST ER DOSE 2
1	BCG	Intradermal [left upper arm]	TB & Bladder Cancer	Birth	-	-	-	-	-	-
2	HepB	Intramuscular [upper arm]	Hepatitis B	Birth	6 weeks	10 weeks	14 weeks	-	-	-
3	OPV	Oral	Polio	Birth	-	-	-	-	-	-
4	IPV	Intramuscular / subcutaneous [upper arm]	Polio	6 weeks	10 weeks	14 weeks	-	-	16-18 months	4 to 6 years
5	DTP	Intramuscular [Thigh]	Diphtheria , tetanus & pertussis	6 weeks	10 weeks	14 weeks	-	-	16-18 months	4 to 6 years
6	Hib	Intramuscular [Thigh]	Meningitis, Hib virus, bacteria	6 weeks	10 weeks	14 weeks	-	-	16-18 months	-

7	PCV	Intramuscular [Thigh]	Pneumonia	6 weeks	10 weeks	14 weeks	-	-	15 months	-
8	Rota Virus	Oral	Severe Diarrhea Disease	6 weeks	10 weeks	14 weeks	-	-	-	-
9	Typhoid	Intramuscular [upper arm / Thigh]	Typhoid Fever Diarrhea	6 months	-	-	-	-	2 years	-
10	MMR	Intramuscular/ Subcutaneous [upperarm/Thigh]	Measles, Mumps & Rubella	9 months	15 months	4 to 6 years	-	-	-	-
11	MCC	Intramuscular [Thigh]	Meningococcal Bacteria	9 months	12 months	-	-	-	-	-
12	Varicella	Subcutaneous [upperarm / Thigh]	Chickenpox	15 months	18 months	-	-	-	-	-
13	Hep A	Intramuscular [upper arm}	Liver Disease	12 months	18 months	-	-	-	-	-
14	Hpv	Intramuscular [Thigh]	Some Cancer & Warts	9 to 12 years	-	-	-	-	-	-
15	Influenza	Intramuscular [Upper arm]	Influenza Virus	6 months	7 months	-	-	-	-	-
16	JE	Intramuscular [Thigh]	Japanese Encephalitis	12 months	13 months	-	-	-	-	-



**BCG VACCINE INTRODUCTION:**

BCG, or bacille Calmette-Guerin, is a vaccine for tuberculosis (TB) disease. The vaccine was originally developed from Mycobacterium bovis, which is commonly found in cattle. BCG vaccination can cause a false positive Mantoux test. The vaccine was developed by French scientists Albert Calmette and Camille Guérin. In 1921, BCG tuberculosis vaccine was first administered to human. India's first BCG Vaccination drive was launched in 1948.

According to survey of 2017 to 2019, the BCG Vaccination rate was 92% in India. BCG is given as a single intradermal injection at the insertion of the deltoidal. BCG vaccine reduces the risk of tuberculosis in people who are not infected with TB. It is more effective in children <6yrs old, providing 50 to 80% protection against meningeal and miliary TB. Protection against TB will only start 6-8 weeks after the vaccination has been given and last for about 10 years. Revaccination is not recommended. BCG vaccination activates the innate immune system and induces changes in the

pattern of histone modifications of specific genes in innate immune cells. BCG also has some effectiveness against buruli ulcer infection and other non - tuberculous mycobacterial infections. Additionally, it is sometimes used as the part of treatment of bladder cancer. BCG has a protective effect against leprosy.

**TYPE :** Attenuated

**TRADE NAME:** Onco-BCG, TheraCys®, TICE® BCG.

Some BCG vaccination are freeze dried and become fine powder. A glass ampoule has to be opened slowly to prevent the air flow from blowing out the powder. Then the powder has to be diluted with saline water before injecting .

#### **SIDE EFFECTS :**

Serious side effects are rare. Often, redness, swelling, and mild pain occur at the site of injection. A small ulcer may also form with some scarring after healing. Side effects are more common and potentially more severe in those with immunosuppression. Although no harmful effects on the fetus have been observed, there is insufficient evidence about the safety of BCG vaccination during pregnancy and therefore, vaccine is not recommended for use during pregnancy. The rare side effects are skin reactions , usually heal within a few weeks and also bone infection . Most of the people develop scar ,once healed the scar may leave small scar.

**INDICATIONS :** Prevention of disseminated , severe forms of tuberculosis.

#### **CONTRAINDICATION :**

- **Immunosuppression:** BCG vaccination should not be given to persons who are immunosuppressed (e.g., persons who are HIV infected) or who are likely to become immunocompromised (e.g., persons who are candidates for organ transplant).
- **Pregnancy:** BCG vaccination should not be given during pregnancy. Even though no harmful effects of BCG vaccination on the fetus have been observed, further studies are needed to prove its safety. Allergy to any component of bcg vaccines or anaphylactic or allergic reactions to a previous dose of BCG vaccine are contraindication for vaccination.
- **Adverse local reactions,** regional lymphadenitis , osteomyelitis and disseminated infection in immunocompromised children with

lymphadenitis, leukemia and generalized malignancy.

#### **HEPATITIS B**

##### **INTRODUCTION:**

Hepatitis B is a serious disease caused by the virus that attacks the liver. The virus, which is called hepatitis B virus (HBV), can cause lifetime's infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death. The cure for hepatitis B virus is hepatitis B vaccine . The Hepatitis B vaccine is suitable for all periods . Hepatitis B vaccine was made up of antibiotics neomycin , polymyxin B and streptomycin. The Hepatitis B vaccine was developed by blumberg and millman on 1981 and united states was approved . A recombinant version came to market on 1986. It is developed by Maurice Hilleman. Hepatitis b vaccine was started in india in 2002. The hepatitis B vaccine is recommended for all babies, all children or adolescents younger than 19 years of age who haven't been vaccinated, all adults age 19 through 59 years, and adults age 60 years or older with threat factors for hepatitis B infection. Adults who are 60 years or older without known risk factors for hepatitis B may also receive hepatitis B vaccine. In India, the coverage of third-dose HepB vaccine has reached 86%. Still , despite high rates of institutional deliveries (78.9%), the birth-dose coverage was only 45% in 2015, with large variations across states. Studies have found that that immune memory against Hepatitis B is sustained for at least 30 years after vaccination, and protects against clinical disease and chronic Hepatitis B infection, indeed in cases where anti-hepatitis B face antigen (anti-Hbs) levels decline below detectable levels.

**TYPE :** Attenuated

**TRADE NAME :** Engerix-B, Heplisav-B, and Recombivax HB

The hepatitis B is given in three shots of series, in infants the first dose is given within 24hrs of birth . The second dose is given one to two months after the first dose and the third dose is given between 6months and 18 months of age . In adults, the second dose is given 1 month after the first dose, the following third dose 6 months after the second dose .

#### **SIDE EFFECTS :**

Serious side effects from the hepatitis B vaccine are veritable uncommon. Pain may do at

the site of injection. It is safe for use during gestation or while breastfeeding. Pain may occur at the site of injection. Flu-like symptoms, muscle ache, dizziness, nausea, vomiting, fatigue, diarrhea.

#### **CONTRAINDICATIONS :**

A severe allergic response, hypersensitivity.

#### **POLIO VIRUS**

##### **INTRODUCTION :**

Polio, or poliomyelitis, is a disabling and potentially life-threatening disease. It is caused by the poliovirus. The virus spreads from man to man and can infect a person's spinal cord, causing paralysis. There is no cure for polio, but it can be prevented with safe and effective vaccination. Two types are used: an inactivated poliovirus given by injection (IPV) and a weakened poliovirus given by mouth. An inactivated (killed) polio vaccine (IPV) developed by Dr. Jonas Salk and first used in 1955, and a live attenuated oral polio vaccine (OPV) was developed by Dr. Albert Sabin and first used in 1961. The inactivated polio vaccines are very safe. Mild redness or pain may occur at the site of injection. Oral polio vaccine results in vaccine-related to paralytic poliomyelitis in about three per million doses. They are generally safe to give to those who are pregnant, and those who have HIV/AIDS, but who are otherwise well. The inactivated polio vaccines are very safe. Mild redness or pain may take place at the site of injection. Oral polio vaccine results in the vaccine-associated paralytic poliomyelitis in about three per million doses. They are generally safe to give to those who are pregnant, and those who have HIV/AIDS, but who are otherwise well. In India, vaccination against polio started in around 1972.

IPV is produced from wild-type poliovirus strains of each serotype that have been deactivated (killed) with formalin. OPV consists of a mixture of live attenuated poliovirus strains of each of the three serotypes, selected by their ability to mimic the immune response following infection with the wild polioviruses, but with a significantly lessened incidence of spreading to the central nervous system. Neomycin, streptomycin, polymyxin B, 2-phenoxyethanol, and formaldehyde are used in the production vaccine. The case fatality ratio for paralytic polio is generally 2% to 5% among children and up to 15% to 30% among adolescents and adults.

Type : attenuated

**TRADE NAME :** Poliovac (PFS/SD), **Imovax®** Polio, **Menactra®**

In infants, 1<sup>st</sup> dose is administered 6-8 weeks of age and 2<sup>nd</sup> dose is administered 4-6 months of age. In adults, first dose is administered 2 injections at a 1-2 month interval and second dose is 6-12 months later.

#### **SIDE EFFECTS :**

Mild redness or pain may take place at the site of injection. fever, conjunctivitis, severe fatigue, injection site reactions (hives, itching, and skin redness), irritability, and loss of appetite. Serious side effects are hives, blue-coloured skin, trouble in breathing, swollen throat or tongue, wheezing, flushed skin, low grade fever.

#### **CONTRAINDICATIONS :**

Hypersensitivity, allergic reactions and people with pregnancy.

#### **DTaP VACCINE**

DTaP vaccine can prevent diphtheria, tetanus, and pertussis. Diphtheria and pertussis spread from person to person. Tetanus enters the body through the cuts or wounds.

- **DIPHTHERIA (D)** can lead to difficulty breathing, heart failure, paralysis and may be death.
- **TETANUS (T)** causes painful stiffening of the muscles. Tetanus can cause serious health problems, including being unable to open the mouth, having trouble swallowing and breathing, or death.
- **PERTUSSIS (aP)**, also known as “whooping cough,” can cause uncontrollable, violent coughing that makes it hard to breathe, eat, or drink. Pertussis can be extremely serious especially in infants and young children, causing pneumonia, convulsions, brain damage, or death. In teens and adults, it can cause weight loss, loss of bladder control, passing out, and rib fractures from severe coughing.

The first vaccine against pertussis was developed in 1930s by pediatrician Leila Denmark. 1991 the DTaP vaccine is licensed. It was introduced in India in 1977. DTaP is only for children younger than 7 years old. Different vaccines against tetanus, diphtheria, and pertussis (Tdap and Td) is available for older children, adolescents, and adults. It is recommended that children should receive 5 doses of DTaP, usually at the following ages:

- 2 months
- 4 months
- 6 months
- 15–18 months
- 4–6 years

DTaP vaccine contain aluminum hydroxide as adjuvant , 4.5 mg of sodium chloride,  $\leq 100 \mu\text{g}$  of residual formaldehyde, and  $\leq 100 \mu\text{g}$  of polysorbate 80.

Type : Attenuated

TRADE NAME : **Daptacel**®, **Infanrix**®, **Kinrix**®, **Pediarix**®, **Pentacel**®, **Quadracel**®, and **Vaxelis**™.

**SIDE EFFECTS** : Have common side effects like skin redness, appetite loss, soreness, fatigue, swelling.

**CONTRAINDICATIONS** : Hypersensitivity , allergic reactions, pregnancy.

### HIB VACCINE

The *Haemophilus influenzae* type B vaccine, also known as Hib vaccine is a vaccine used to prevent *Haemophilus influenzae* type b (Hib) infection. . It contains a part of the capsule of dead bacteria *H. influenzae* In countries that include it as a routine vaccine, rates of severe Hib infections have decreased more than 90%. It has accordingly resulted in a decrease in the rate of meningitis, pneumonia, and epiglottitis. Two or three doses should be given before the six months of age. In United States a fourth dose is recommended between 12 and 15 months of age. The first dose is recommended around six weeks of age with at least four weeks between each dose . If only two doses are used, another dose is used later in life is recommended. It is given by injection into a muscle. Severe side effects are extremely rare. About 20 to 25% of people develop pain at the site of injection while only about 2% develop a fever. All Hib vaccines that are currently used will conjugate vaccine. Hib conjugate vaccines have been shown to be effective against all the manifestations of Hib disease, with a clinical efficacy among fully vaccinated children estimated to be between 95–100%. The CDC and the WHO recommend that all infants be vaccinated using polysaccharide-protein conjugate Hib vaccine, starting after the age of six weeks. The vaccination is also indicated in people without spleen.

VACCINE TYPE : Conjugate

TRADE NAME : ActHIB, Hiberix, OmniHIB, others

### SIDE EFFECTS:

Clinical trials and ongoing surveillance have shown that Hib vaccine to be safe. In general, adverse reactions to the vaccines are mild. The most common reactions are mild fever, loss of appetite, transient redness, swelling, or pain at the site of injection, occurring in 5–30% of vaccine recipients. More severe reactions are extremely rare.

### CONTRAINDICATIONS:

A person who ever had a severe allergic reaction (e.g., anaphylaxis) after a previous dose. Children less than six weeks of age. Persons who have a moderate or severe acute illness, who should receive the vaccine only after recovery from the illness.

### ROTA VACCINE

#### INTRODUCTION:

The rotavirus vaccine is a vaccine used to protect against rotavirus infections, which are the leading cause of severe diarrhea among young children. The vaccines prevent 15–34% of severe diarrhea in the developing world and 37–96% of the risk of death among young children due to severe diarrhea. Immunizing babies decreases rates of disease among older people and those who have not been immunize. It is given through mouth and requires two or three doses. It should be given starting around six weeks of age. The vaccines are safe. This includes their use in people with HIV/AIDS. The vaccines are made from weakened rotavirus.

**SCHEDULE:** The World Health Organization recommends the first dose of vaccine can be given right after six weeks of age.

**SIDE EFFECTS:** With any vaccine there is chance of a serious allergic reaction. Signs of an allergic reaction can include:

- Difficulty breathing
- Wheezing
- Hives
- Paleness
- Fast heart beat

However, with the rotavirus vaccine, the risk of serious reaction is extremely small. Most children who gets the vaccine have no problem at all. However, there is a slight chance your child may have temporary, mild effects of following the vaccine including:

- Increased irritability
- Diarrhea, vomiting

## TYPHOID VACCINE

### INTRODUCTION:

Typhoid vaccines are vaccines that prevent the typhoid fever.

Several types of typhoid vaccines are widely available:

Typhoid conjugate vaccine (TCV)

Ty21a (a live oral vaccine)

Vi capsular polysaccharide vaccine (ViPS) (an injectable subunit vaccine)

### SIDE EFFECTS:

Fever

general feeling of discomfort or illness

pain, redness, swelling, tenderness or a lump at the place of injection

unusual tiredness or weakness

### USES:

Ty21a, the Vi capsular polysaccharide vaccine, and Vi-rEPA are effective in reducing the typhoid fever with low rates of adverse effects.

### Contraindications :

Vaccination should be postponed in patients with the acute febrile illness or acute GI illness.

Oral vaccine: Not to be used in congenital or acquired immunodeficient state, including patients receiving immunosuppressive or antimitotic drugs.

VACCINE TYPE : Conjugate

TRADE NAME : Typhim Vi, Vivotif

### Schedule:

Depending on formulation it can be given starting at the age of two (ViPS), six (Ty21a), or six months (TCV).

## MMR VACCINE

### INTRODUCTION:

The MMR vaccine is a vaccine against measles, mumps, and rubella (German measles), abbreviated as MMR.

### MEASLES

Rubella : Rubella, also known as German measles, was also very common before widespread vaccination. The major risk of rubella is during pregnancy when the baby may contract congenital rubella, which can cause significant congenital defects. Mumps is another viral disease that was once very common, especially during childhood. If mumps is acquired by a male who is past puberty, a possible

complication is bilateral orchitis, which can in some cases lead to sterility.

### Administration

The MMR vaccine is administered by a subcutaneous injection

VACCINE TYPE : Attenuated

TRADE NAME : PRIORIX®

### SIDE EFFECTS:

- Sore arm from the shot
- Fever
- Mild rash
- Temporary pain and stiffness in the joints, mostly in teenage or adult women who did not already have immunity to the rubella component of the vaccine

### Contraindications

- Severe allergic reaction/anaphylaxis after a previous dose of MMR / MMRV or after one of the components of the vaccine (e.g., neomycin, gelatin)[5]
- Pregnancy or planning for it - the pregnancy should be discouraged within 28 days of vaccination due to the risk of congenital rubella. ...
- Immunodeficiency.

### DOSE:

Children should get two doses of MMR vaccine, starting with the first dose at 12 to 15 months of age, and the second dose at 4 through 6 years of age.

## Meningococcal

### Introduction :

Meningococcal vaccine refers to any vaccine used to prevent infection by *Neisseria meningitidis*. The vaccines are between 85 and 100% effective for at least two years. They result in a decrease in meningitis and sepsis among the people where they are broadly used. The first meningococcal vaccine became available in the 1970s. Meningococcal meningitis and septicaemia are caused by the various serogroups of *Neisseria meningitidis*. Endemic disease occurs worldwide and is mostly caused by meningococci of serogroups A, B, or C, although group Y is gaining importance, at least in parts of the US.

Type: Conjugate or polysaccharide

Trade name : Menactra, Menveo, Menomune

## Varicella

### Introduction

Varicella vaccine, also known as the chickenpox vaccine. It is a vaccine that protects against chickenpox. One dose of vaccine prevents 95% of the moderate disease and 100% of the severe disease. Two doses of vaccine are more effective than one. It is given by injection subcutaneously.

Type: attenuated

Minor side effects may include pain at the site of injection, fever, and rash.

It is not recommended during; but few times it has been given during pregnancy no problems resulted. The vaccine is available either by itself or along with the MMR vaccine, in a version known as a MMRV vaccine.

A live attenuated varicella vaccine, the Oka strain, was developed by Michiaki Takahashi and his fellow workers in Japan in the early 1970s.

### Contraindication:

The varicella vaccine is not recommended for severely ill people, pregnant women, people who have tuberculosis, people who have experience of a serious allergic reaction to the varicella vaccine in the past, people who are allergic to gelatin, people allergic to neomycin, people receiving high dose of steroids, people receiving treatment for cancer with x-rays or chemotherapy, as well as people who have received blood products or transfusions during the past five months. After receiving the varicella vaccine, the use of salicylates should be avoided for at least six weeks.

### SIDE EFFECTS :

severe reactions such as meningitis and pneumonia have been reported (mainly in unintentionally vaccinated immunocompromised children) as well as anaphylaxis. The possible mild side effects include redness, stiffness, and soreness at the injection site, as well as fever. A few people may develop a mild rash, which usually appears around the site of injection.

## HEPATITIS A

### Introduction :

Hepatitis A is a serious liver disease. It is generally spread through close, personal contact with an infected person or when a person

unintentionally ingests the virus from objects, food, or drinks that are contaminated by small quantities of stool (poop) from an infected person.

Hepatitis A vaccine (HepA) is first licensed in 1992. Hepatitis A, caused by hepatitis A virus (HAV), is primarily transmitted by the fecal-oral route.

Vaccine type : Inactivated or attenuated

### Risk of the vaccination reaction ?

Soreness or redness where the shot is given, fever, headache, tiredness, or loss of appetite can happen after the hepatitis A vaccination. People occasionally faint after medical procedures, including vaccination. Tell your provider if you feel dizzy or have vision changes or ringing in the ears. As with any drug, there is a veritably remote chance of a vaccine causing a severe allergic reaction, other serious injuries or death.

**What if there is serious problem ?** An allergic reaction could occur after the vaccinated person leaves the clinic. However, swelling of the face and throat, difficulty in breathing, if you see signs of a severe antipathetic response (hives). call **9-1-1** and get the person to the nearest hospital.

## HPV VACCINE

**INTRODUCTION:** Human papilloma virus is used to prevent most cases of cervical cancer cervical, anal, oropharyngeal, penile, vulvar, and vaginal.

**History:** The HPV vaccine was first developed by the University of Queensland in Australia by Professors Ian Frazer and Jian Zhou. In 1990, Frazer and Zhou began to synthesise particles that mimicked HPV, from which the vaccine would later be made. In 1991, Frazer and Zhou's findings were first presented to the scientific community. After seven years of design and testing, the first human trials for the vaccine, named Gardasil, were completed. This vaccine prevented four high-risk HPV types (HPV 6, 11, 16, and 18), which would target over 70% of cervical cancer cases. In 2006, following extensive clinical trials which found the vaccine to provide almost 100% protection against HPV 16 and 18, the vaccine was approved for use by Australia and the USA, and by 2007 the vaccine was approved in 80 countries. Since then, two further vaccines have been approved: a bivalent vaccine called Cervarix approved in 2007 that prevents two HPV types (HPV16 and 18) and a nonavalent vaccine called Gardasil 9 in 2014 that protects against nine HPV types (HPV 6, 11, 16, 18, 31, 33,



45, 52, and 58). As of October 2019, 100 countries worldwide vaccinate against HPV as part of their regular vaccine schedule. GRADASIL - Quadrivalent vaccine, licensed for use since June 2006, by FDA & since 2008 in India. It targets four strains of human papilloma virus (HPV) - 6, 11, 16 & HPV 18 account for about 80 - 85 % for all cervical cancer in India. HPV vaccine is administered intramuscularly in the deltoid region of the upper arm or in the higher anterolateral area of the thigh.

**TYPE:** Not a live vaccine

**CONTRAINDICATIONS:** The HPV vaccine isn't recommended for pregnant women or people who are moderately or severely ill. Tell your doctor if you have any severe allergies, including an allergy to yeast or latex. Also, if you've had a life-threatening allergic reaction to any component of the vaccine or to a previous dose of the vaccine, you shouldn't get the vaccine.

**SIDE EFFECTS:** The HPV vaccine has been found to be safe in many studies. Overall, the effects are usually mild. The most common side effects of HPV vaccines include soreness, swelling or redness at the injection site. Sometimes dizziness or fainting occurs after the injection. Remaining seated for 15 minutes after the injection can reduce the risk of fainting. Headaches, nausea, vomiting, fatigue or weakness also may occur. The CDC recommends all boys and girls get the HPV vaccine between the ages of 11 and 12, the age for optimal protection. They should get two shots, six to 12 months apart. "Vaccines given to 14 or 15 year olds are late and less effective."

## INFLUENZA

### INTRODUCTION :

**Influenza vaccines**, also known as **flu shots**, are vaccines that protect against infection by the influenza viruses. The influenza virus quickly changes. In the 1940s, the US military developed the first approved inactivated vaccines for influenza, which were used during World War II. The first inactivated flu vaccine was evolved by Thomas Francis and Jonas Salk at the University of Michigan. The vaccine was evaluated for safety and efficacy on the US military, before being licensed for wider use in 1945. The Pasteur Institute of India developed influenza vaccine in 1957. If the persons of 65 years of age and above are affected with influenza will have approximate death rate of a 90 %. For the 2017-2018 influenza season, influenza vaccine

coverage rates among the active clinical population (patients with 2 visits in the past 3 years), 6 months and older served by IHS, Tribal and Urban (I/T/U) facilities was 36%, consistent with coverage in the previous year.

Influenza vaccine contains multiple inactive strains of the virus. Once administered, the human immune system builds antibodies that recognize these flu strains. That way when the active flu virus enters the body, the immune system is able to recognize the invader and defend itself. This influenza spreads mainly from person to person when those with influenza cough or sneeze. Influenza vaccine contains the 2 surface proteins known as hemagglutinin and neuraminidase.

**VACCINE TYPE :** Inactivated vaccine

**TRADENAME:** Fluzone/Fluzone Quadrivalent and Vaxigrip/Vaxigrip Tetra, Influvac and Optaflu.

### SIDE EFFECTS :

Some common side effects are Soreness, redness, swelling, headache, fever, muscle ache, fatigue, watery nose, stuffy nose in children and adults.

### CONTRAINDICATIONS :

- Moderate or severe acute illness with or without the fever.
- History of Guillain-Barré syndrome within 6 weeks of receipt of the influenza vaccine.
- History of severe allergic reaction to a previous dose of any other influenza vaccines.
- A person with an acute febrile illness shouldn't be vaccinated until their symptoms have been resolved.

## JAPANESE ENCEPHALITIS

### INTRODUCTION

Japanese encephalitis vaccine is a vaccine that protects us from against Japanese encephalitis. The vaccines are further than 90% effective. The duration of protection with the vaccine is not clear but its effectiveness appears to decrease over time. Doses are given either by injection into muscle or just under the skin. It is recommended as part of routine immunizations in the countries where the disease is a problem.<sup>[2]</sup> One or two doses are given depending on the version of the vaccine. Extra doses are not generally needed in areas where the disease is in common. In those with HIV/AIDS or those who are pregnant an inactivated vaccine should be used. The Japanese encephalitis vaccines first

became available in the 1930s. It is on the World Health Organization's List of Essential Medicines. Japanese encephalitis vaccines first became available in the 1930s. Inactivated Vero cell culture-derived Japanese encephalitis (JE) vaccine (manufactured as IXIARO) is the only JE vaccine licensed and available in the United States. This vaccine was approved in March 2009 for use in people aged 17 years and older and in May 2013 for use in children 2 months through 16 years of age. Other JE vaccines are manufactured and used in other countries but are not licensed for use in the US.

**DOSE:** IXIARO is given as a two-dose series, with the doses spaced 28 days apart. Adults aged 18–65 years can get the second dose as early as 7 days after the first dose. The last dose should be given at least 1 week before travel. A booster dose (third dose) should be given if a person has received the two-dose primary vaccination series one year or more previously and there is a continued risk for JE virus infection or potential for unmasking. For adults and children aged 3 years or older, each dose of IXIARO is 0.5 mL. For children aged 2 months through 2 years, each dose is 0.25 mL.

**ADVERSE REACTIONS:** Reactions to IXIARO are generally mild and include pain and tenderness, mild headaches, myalgia (muscle aches), and low-grade fevers. Less than 1% of people infected with Japanese encephalitis (JE) virus develop the neurologic illness. In persons who develop symptoms, the time from infection until illness outbreak (incubation period) is typically 5-15 days.

- Initial symptoms often include fever, headache, and vomiting.
- Mental status changes, neurologic symptoms, weakness, and movement disorders might develop over the next few days.
- Seizures are common, especially among children.
- Among patients who develop encephalitis, 20% – 30% die.
- Although some symptoms improve after the acute illness, 30%-50% of survivors continue to have neurologic, cognitive, or psychiatric symptoms.

**VACCINE TYPE:** Inactivated or Attenuated

**TRADE NAME:** Ixiaro, Imojev

**CONTRAINDICATIONS:**

(JE) vaccines are contraindicated in people who have had:

- Anaphylaxis after a previous dose of any JE vaccine.
- anaphylaxis after any component of a JE vaccine
- Imojev is contraindicated in people who are immune compromised and in pregnant women because it is a live attenuated viral vaccine. Women should avoid pregnancy for the 28 days after vaccination.
- Breastfeeding women should not receive Imojev because it isn't known whether the virus is excreted in the breast milk.

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