

National Immunization Schedule

Immunization is one of the most important and cost effective strategies for the prevention of childhood sicknesses and disabilities and is thus a basic need for all children. The following schedule has been recommended by the Ministry of Health, Govt. of India and is one of the most widely followed by the child health care providers.

Vaccine	When to give	Maximum age	Dose	Route	Site
For Pregnant Women					
Td -1	early pregnancy	--	0.5ml	intra muscular	Upper arm
Td -2	4 weeks after 1st dose of Td*	--	0.5ml	intra muscular	Upper arm
Td booster	If received 2 Td doses in a pregnancy within the last 3yrs	--	0.5ml	intra muscular	Upper arm
For Infants					
BCG	At birth or as early as possible till 1 year of age	At birth till one year	0.1ml (0.05ml until 1month age)	Intra-dermal	Left Upper Arm
Hepatitis B - Birth dose	At birth or as early as possible within 24 hours	At birth within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
OPV -0	At birth or as early as possible within first 15 days	Within the first 15 days	2 drops	Oral	Oral
OPV -1,2,3,	6 weeks, 10 weeks & 14 weeks	Till 5 years of age	2 drops	Oral	Oral
fIPV 1 &2	6 weeks & 14 weeks	1 year of age	0.1 ml	Intra-dermal	Upper arm
Pentavalent vaccine - 1, 2 & 3	6 weeks, 10 weeks & 14 weeks	1 year of age	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
RVV 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks	1 year of age	5 drops	Oral	Oral
PCV 1, 2 & Booster	At 6 weeks, 14 weeks & 9 months	1 year of age	0.5 ml	Intra-muscular	Antero-lateral side of mid-

					thigh
MCV 1/ MR 1	9 completed months - to 12 months. Give up to 5yrs if not received at 9 - 12 months age	5 years of age	0.5 ml	Sub-cutaneous	Right upper arm
Vitamin A (1st dose)	At 9 completed months	5 years of age	1ml (1lakh IU)	Oral	Oral
Japanese Encephalitis (1st Dose)***	At 9 completed months - 12 months	15 years of age	0.5 ml	Sub-cutaneous	Left Upper Arm
For Children and adolescents					
DPT booster 1	16- 24 months	7 years of age	0. 5 ml	Intra-muscular	Antero-lateral side of mid-thigh
MCV 2/ MR 2	16-24 months	5 years of age	0.5 ml	Sub-cutaneous	Right Upper arm
OPV Booster	16-24 months	5 years of age	2 drops	Oral	Oral
Japanese Encephalitis*** (if applicable)	16-24 months	15 years of age	0.5 ml	Sub-cutaneous	Left Upper Arm
Vitamin A*** (2nd to 9th dose)	18 months (2nd dose). Then, one dose every 6 months upto the age of 5 years.	5 years of age	2 ml (2 lakh IU)	Oral	Oral
DPT booster	5- 6 years	7 years of age	0.5 ml	Intra-muscular	Upper arm
Td	10 years & 16 years	16 years of age	0.5 ml	Intra-muscular	Upper arm

* Give Td-2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give Td to a women in labour if, she has not previously received Td.

Pentavalent vaccine (containing Diphtheria+Pertussis+Tetanus+Hepatitis B+Hib)

*** JE vaccine at select endemic districts

Rotavirus vaccine (RVV) as part of Universal Immunization Programme

In India, every year 37 out of every 1000 children born are unable to celebrate their 5th birthday, and one of the major reasons for this is diarrheal deaths. Out of all the causes of diarrhoea, rotavirus is a leading cause of diarrhoea in children less than 5 years of age. It is estimated that rotavirus cause 8,72,000 hospitalizations; 32,70,000 outpatient visits and estimated 78,000 deaths annually in India. The introduction of Rotavirus vaccine will enable to directly address the problem of diarrheal deaths. Rotavirus vaccine was introduced in 2016 in a phased manner, beginning with 4 states initially and later expanded to 7 more states making it a total of 11 states by end of 2018, where Rotavirus vaccine was available in the country. The vaccine has been further expanded to 17 more states. Rotavirus vaccine is now available in 28 States/UTs, namely, Andhra Pradesh, Haryana, Himachal Pradesh, Jharkhand, Odisha, Assam, Tripura, Rajasthan, Tamil Nadu, Madhya Pradesh, Uttar Pradesh, Manipur, Daman & Diu, Gujarat, Bihar, Sikkim, Arunachal Pradesh, Chhattisgarh, Maharashtra, Dadra & Nagar Haveli, Goa, Chandigarh, Nagaland, Delhi, Mizoram, Punjab, Uttarakhand, and Andaman and Nicobar Islands. The vaccine is expected to be available in all 36 States/UTs by September 2019.

Pentavalent vaccines

The pentavalent vaccine is a combination of DPT (diphtheria, Pertussis/whooping cough and tetanus), Hepatitis B and Hib vaccines. DPT and Hepatitis B vaccines are already a part of the immunisation programme. They are being replaced by pentavalent vaccine in a phased manner in the country. Each pentavalent vaccine consists of 0.5ml dose that will be given intramuscularly in the mid-thigh region through syringes.

The revised immunisation schedule, when pentavalent vaccines are introduced is as follows.

Vaccine	Schedule
BCG, Hep B birth dose, OPV-O	At Birth
Pentavalent (DPT + Hep B + Hib), OPV	6 weeks, 10 weeks and 14 weeks
Measles and Vitamin A	9-12 months
DPT booster, OPV booster, Measles2*	16-24 months
DPT booster	5-6 years

Introduction of Pneumococcal Conjugate Vaccine (PCV) under Universal Immunisation Programme

The Health Ministry has approved the introduction of Pneumococcal Conjugate Vaccine (PCV) under Universal Immunisation Programme. Himachal Pradesh will be among four other states where Pneumonia Vaccines will be introduced along with Bihar, Uttar Pradesh, Rajasthan and Madhya Pradesh in a planned manner from 2017.

IAP (Indian Academy of Pediatrics) Recommendations

Indian Academy of Pediatrics, the largest professional organization of pediatricians in our country, fully endorses and supports the national schedule. It supplements the above schedule further, with additional vaccines such as Hepatitis B vaccine to be given in three doses (at birth, one month and six months of age.) and MMR (Measles, Mumps & Rubella vaccine) at about 15 to 18 months of age. It must be remembered that even though rubella may appear to be a mild illness, it has a serious potential to cause congenital defects in a baby, whose mother is not protected against rubella and catches the infection during early pregnancy.

Age	Vaccines
Birth	BCG, OPV 0, Hepatitis B -1
6 weeks	IPV-1, DTwP-1, Hepatitis B -2, Hib -1, Rotavirus 1, PCV 1
10 weeks	DTwP-2, IPV 2, Hib -2, Rotavirus 2, PCV 2
14 weeks	DTwP-3 , IPV-3 , Hib -3, Rotavirus 3, PCV 3
6 months	OPV 1, Hep B 3
9 months	OPV 2, MMR-1
9-12 months	Typhoid Conjugate Vaccine
12 months	Hep-A 1
15 months	MMR 2, Varicella 1, PCV Booster
16-18 months	DTwP B 1 / DTaP booster -1, IPV B 1, Hib booster 1
18 months	Hep-A 2

2 years	Booster of Typhoid Conjugate Vaccine
4 - 6 years	DTwP B 2 / DTaP booster -2, OPV 3, MMR 3, Varicella 2,
10 - 12 years	Tdap / Td, HPV (Only for females, three doses at 0, 1-2 and 6 months

Abbreviations:

1. **BCG:** Bacillus Calmette Guerin
 2. **OPV:** Oral poliovirus vaccine
 3. **DTwP:** Diphtheria, tetanus, whole cell Pertussis
 4. **DT:** Diphtheria and tetanus toxoids
 5. **TT:** Tetanus toxoid
 6. **Hep B:** Hepatitis B vaccine
 7. **MMR:** Measles, Mumps and Rubella Vaccine
 8. **Hib:** Hemophilus influenzae Type 'b' Vaccine
 9. **IPV:** Inactivated poliovirus vaccine
 10. **Td:** Tetanus, reduced dose diphtheria toxoid
 11. **HPV:** Human Papilloma Virus Vaccine
 12. **PCV:** Pneumococcal Conjugate Vaccine
 13. **Tdap:** Tetanus and Diphtheria Toxoids and a Cellular Pertussis Vaccine
- For the complete IAP recommended immunization schedule, visit [Immunization schedule](#)

WHO-India Recommendation

WHO recommended Immunization Schedule

Vaccine	Age				
	Birth	6 weeks	10 weeks	14 weeks	9-12 months
Primary vaccination					
BCG	X				
Polio	X	X	X	X	
DTP		X	X	X	
Hepatitis B*		X	X	X	
Rotavirus		X	X	X	
Haemophilus influenzae type b		X	X	X	
Pneumococcal (Conjugate)		X	X	X	
Measles					X
Rubella					X

For the detailed schedule, visit the link http://www.who.int/immunization/policy/Immunization_routine_table2.pdf?ua=1

For WHO recommendations for interrupted and delayed vaccination, visit the link http://www.who.int/immunization/policy/Immunization_routine_table3.pdf?ua=1

FAQs on Child Immunization

What is immunization and how does it work ?

Immunization is a way of protecting the human body against infectious diseases through vaccination. Immunisation prepares our bodies to fight against diseases in case we come into contact with them in the future.

Babies are born with some natural immunity which they get from their mother and through breastfeeding. This gradually wears off as the baby's own immune system starts to develop. Having your child immunized gives extra protection against illnesses which can kill.

The schedule recommends that that the vaccinations should start when the baby is 1 1/2 months old. But what should be done if the baby is brought late for vaccinations? Should vaccination still be started?

Yes, definitely. Even if the baby is brought late for vaccinations, s/he should still receive all the vaccinations. While it is best to follow the ideal immunization schedule, on no account should the baby be denied vaccinations, even if s/he is brought late for them. But every attempt must be made to complete full immunization, before the age of 1 year.

What are the side effects of vaccinations?

Only very few infants and children develop side effects after a vaccination. For example, after the DPT injection, the infant may have pain at the site of the injection and may even develop fever.

After the measles injection, measles like rashes may appear. These are normal. Very rarely, children can have allergic reactions straight after immunization. Also if the baby develops high fever or loses consciousness, a doctor should be consulted immediately. People giving immunizations are trained to deal with allergic reactions and if the child is treated quickly, he or she will recover fully.

Sometimes it is not possible to take the baby for the second and third vaccinations after precisely a month. If so, should the whole course be repeated?

No, a slight delay does not matter. Continue the vaccinations as per the schedule and complete the course as soon as possible. The child will be fully protected only after s/he has received 1 BCG injection, 3 DPT injections, 3 OPV doses and 1 measles injection. Hence it is very important to take the baby for the vaccination at the correct time and to make sure that all the vaccinations are given.

Are there any reasons why a child should not be immunized?

There are very few reasons why a child should not be immunized. Ordinarily common illnesses like a cold or a diarrhea are not impediments against getting the child vaccinated.

There are certain situations though, where you must let the doctor know of the child's conditions. Following are some of them:

1. The child has a high fever
2. S/He has had a bad reaction to another immunization
3. S/He has had a severe reaction after eating eggs
4. S/Has had a convulsion (fits) in the past. (With the right advice, children who have had fits in the past can be immunized)
5. S/He has had, or is having, treatment for cancer
6. S/He has any illness which affects the immune system, for example, HIV or AIDS
7. S/He is taking any medicine which affects the immune system, for example, immunosuppressant (given after organ transplant or for malignant disease) or high-dose steroids.

How do we know that vaccines are safe?

Vaccines like all other medicines undergo extensive and rigorous tests regarding their safety. Only after they have been found to be safe that they are introduced for general vaccination programs. Each vaccine

is continually checked even after it has been introduced and action is taken if it is needed. If a vaccine is not safe it is not used.

Why give BCG vaccine only on the left upper arm?

BCG is given on the left upper arm to maintain uniformity and for helping surveyors in verifying the receipt of the vaccine.

Why do we give 0.05ml dose of BCG to newborns (below 1 month of age)?

This is because the skin of newborns is thin and an intradermal injection of 0.1ml may break the skin or penetrate into the deeper tissue and cause local abscess and enlarged axillary lymph nodes.

Why is BCG given only up to one year of age?

Most children acquire natural clinical/ sub-clinical tuberculosis infection by the age of one year. This too protects against severe forms of childhood tuberculosis e.g. TB meningitis and miliary disease.

If no scar appears after administering BCG, should one re-vaccinate the child?

There is no need to revaccinate the child even if there is no scar.

Till what age can a child be given OPV?

OPV can be given to children till 5 years of age.

Can OPV and vitamin A be given together with DPT Booster dose?

Yes.

Can an infant be breastfed immediately after OPV?

Yes.

If a child could not receive DPT 1, 2, 3 and OPV 1, 2, 3 according to the schedule, till what age can the vaccine be given?

The DPT vaccine can be given until 2 years of age and OPV can be given till 5 years of age. If a child has received previous doses but not completed the schedule, do not restart the schedule and instead administer the remaining doses needed to complete the series.

If a child comes between the ages of 2 to 5 years without having received any vaccine, what vaccines should be given?

If the child comes between 2 to 5 years without any vaccination, two doses of DT can be given with OPV with a minimum gap of 4 weeks (or one month). A single dose of measles vaccine also needs to be given with first dose of DT.

Why should there be a minimum gap of 4 weeks between two doses of DPT?

This is because decreasing the interval between two doses may interfere with the antibody response and protection.

Why give the DPT vaccine in the antero-lateral mid thigh and not the gluteal region (buttocks)?

DPT is given in the antero-lateral mid-thigh and not the gluteal region to prevent damage to the sciatic nerve. Moreover, the vaccine deposited in the fat of gluteal region does not invoke the appropriate immune response.

What should one do if the child is found allergic to DPT or develops encephalopathy after DPT?

A child who is allergic to DPT or develops encephalopathy after DPT should be given the DT vaccine instead of DPT for the remaining doses, as it is usually the P (whole cell Pertussis) component of the vaccine which causes the allergy/encephalopathy.

If a girl received all doses of DPT, DT and TT as per the NIS till 16 years of age and she gets pregnant at 18 years, should she get one dose of TT during pregnancy?

Give 2 doses of TT during the pregnancy as per the schedule.

Can Hepatitis B vaccine be mixed in the same syringe with DPT and given as one injection?

No, DPT and Hepatitis B vaccine (if supplied separately) cannot be mixed or administered through the same syringe.

Until what age can Hepatitis B vaccine be given?

According to the National Immunization Schedule, Hepatitis B vaccine should be given with the first, second and third doses of DPT till one year of age.

Why give the birth dose of Hepatitis B vaccine only within 24 hours of birth?

The birth dose of Hepatitis B vaccine (within the first 24 hours) is effective in preventing peri-natal transmission of Hepatitis B.

Why give the Measles vaccine only on the right upper arm?

The Measles vaccine is given on the right upper arm to maintain uniformity and to help surveyors in verifying the receipt of the vaccine.

If a child has received the Measles vaccine before 9 months of age, is it necessary to repeat the vaccine later?

Yes, the Measles vaccine needs to be administered, according to the National Immunization Schedule, after the completion of 9 months until 12 months of age. If not administered in the ideal age for Measles vaccine, it can be administered until 5 years of age.

If a child 16-24 months of age has been immunized with JE vaccine during an SIA, can it receive the JE vaccine again, as part of RI?

No, currently this is a single dose vaccine and should not be repeated.

If a child above 2 years (24 months) of age has not received the JE vaccine through either RI or an SIA, should s/he be given the JE vaccine?

Yes, the child is eligible to receive a dose of the JE vaccine, through RI, till the age of 15 years.

How many prophylactic doses of vitamin A should be given and till what age?

A total of 9 prophylactic doses of vitamin A should be given till 5 years of age.

What should be the minimum gap between two doses of Vitamin A?

The minimum gap between any two doses of vitamin A should be 6 months.

How should Vitamin A syrup be administered?

Vitamin A syrup should be administered using only the spoon/dispenser provided with each bottle. The half mark in the spoon indicates 100,000 IU and a level full spoon contains 200,000 IU of Vitamin A.

How long can a bottle of Vitamin A be used, once opened?

A Vitamin A bottle, once opened, should be used within 6-8 weeks. Write the date of opening on the bottle.

Other than Vitamin A supplementation, what are other policy guidelines to prevent vitamin A deficiency?

These are promotion of

1. Early and exclusive breast feeding, including feeding of colostrum, rich in vitamin A.
2. Regular consumption of dark green leafy vegetables or yellow and orange fruits and vegetables like pumpkin, carrots, papaya, mango, oranges along with cereals and pulses to a weaning child
3. Consumption of milk, cheese, curd, ghee, eggs, liver etc.

If a child who has never been vaccinated is brought at 9 months of age, can all the due vaccines be given to a child on the same day?

Yes, all the due vaccines can be given during the same session but at different injection sites using separate AD syringes. It is safe and effective to give BCG, DPT, Hepatitis B, OPV and Measles vaccines and Vitamin A at the same time to a 9 months old child who has never been vaccinated.

If the mother/caregiver permits administration of only one injection during an infant's first visit at 9 months of age, which vaccine should be given?

At 9 months of age, the priority is to give measles vaccine with OPV and Vitamin-A.

Which vaccines can be given to a child between 1-2 years of age, who has never been vaccinated?

The child should be given DPT1, OPV-1, Measles and 2ml of Vitamin A solution. It should then be given the second and third doses of DPT and OPV at one month intervals till 2 years of age. The Booster doses can be given at a minimum of 6 months after administering OPV3/DPT3.

What is the treatment schedule for children with clinical signs of vitamin A deficiency?

Administer 200,000 IU of Vitamin A immediately after diagnosis, followed by another dose of 200,000 IU, 1-4 weeks later.

What are the storage guidelines for un-opened bottles of Vitamin A solution?

Vitamin A solution must be kept away from direct sunlight and can be used until the expiry date.