



# IAP Recommended Immunization Schedule 2013 for Children Aged 0-18 years (with range)



Age Vaccine	Birth	6 wk	10 wk	14 wk	18 wk	6 mo	9 mo	12 mo	15 mo	18 mo	19-23 mo	2-3 yr	4-6 yr	7-10 yr	11-12 yr	13-18 yr	
BCG	BCG																
Hep B	Hep B1																Hep B2
Polio	OPV 0	IPV 1	IPV 2	IPV 3		OPV 1	OPV 2	IPV B1				OPV 3					
DTP		DTP 1	DTP 2	DTP 3					DTP B1			DTP B2					
Tdap															Tdap		
Hib		Hib 1	Hib 2	Hib 3					Hib Booster								
Pneumococcal		PCV 1	PCV 2	PCV 3					PCV Booster			PCV					
PPSV23												PPSV					
Rotavirus		RV 1	RV 2	RV 3													
Measles							Measles										
MMR								MMR 1			MMR 2						
Varicella								VAR 1			VAR 2						
Hep A								Hep A1 & Hep A2									
Typhoid												Typhoid					
Influenza					Influenza (yearly)												
HPV															HPV 1-3		
Meningococcal												Meningococcal					
Cholera								Cholera 1 & 2									
JE								Japanese Encephalitis									

- This schedule includes recommendations in effect as of November 2013.
- These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1.

- Range of recommended ages for all children
- Range of recommended ages for catch-up immunization
- Range of recommended ages for certain high-risk groups
- Not routinely recommended

# Footnotes: Recommended Immunization Schedule for Persons Aged 0 through 18 Years — IAP, 2013

## I. General instructions:

- Vaccination at birth means as early as possible within 24 to 72 hours after birth or at least not later than one week after birth
- Whenever multiple vaccinations are to be given simultaneously, they should be given within 24 hours if simultaneous administration is not feasible due to some reasons
- The recommended age in weeks/months/years mean completed weeks/months/years
- Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible.
- The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines
- When two or more live parenteral/intranasal vaccines are not administered on the same day, they should be given at least 28 days (4 weeks) apart; this rule does not apply to live oral vaccines
- If given <4 weeks apart, the vaccine given 2nd should be repeated
- The minimum interval between 2 doses of inactivated vaccines is usually 4 weeks (exception rabies)
- Vaccine doses administered up to 4 days before the minimum interval or age can be counted as valid (exception rabies). If the vaccine is administered > 5 days before minimum period it is counted as invalid dose.
- Any number of antigens can be given on the same day
- Changing needles between drawing vaccine into the syringe and injecting it into the child is not necessary.
- Different vaccines should not be mixed in the same syringe unless specifically licensed and labeled for such use.
- Patients should be observed for an allergic reaction for 15 to 20 minutes after receiving immunization(s).
- When necessary, 2 vaccines can be given in the same limb at a single visit.
- The anterolateral aspect of the thigh is the preferred site for 2 simultaneous IM injections because of its greater muscle mass.
- The distance separating the 2 injections is arbitrary but should be at least 1 inch so that local reactions are unlikely to overlap
- Although most experts recommend "aspiration" by gently pulling back on the syringe before the injection is given, there are no data to document the necessity for this procedure. If blood appears after negative pressure, the needle should be withdrawn and another site should be selected using a new needle.
- A previous immunization with a dose that was less than the standard dose or one administered by a nonstandard route should not be counted, and the person should be re-immunized as appropriate for age.

## II. Specific instructions:

### 1. BCG Vaccine

#### Routine Vaccination:

- Should be given at birth or at first contact

#### Catch-up Vaccination:

- May be given up to 5 years

### 2. Hepatitis B (HepB) Vaccine

#### Routine Vaccination:

- Minimum age: birth

- Administer monovalent HepB vaccine to all newborns within 48 hours of birth.
- Monovalent HepB vaccine should be used for doses administered before age 6 weeks.
- Administration of a total of 4 doses of HepB vaccine is permissible when a combination vaccine containing HepB is administered after the birth dose.
- Infants who did not receive a birth dose should receive 3 doses of a HepB containing vaccine starting as soon as feasible.
- The ideal minimum interval between dose 1 and dose 2 is 4 weeks, and between dose 2 and 3 is 8 weeks. Ideally, the final (3<sup>rd</sup> or 4<sup>th</sup>) dose in the HepB vaccine series should be administered no earlier than age 24 weeks and at least 16 weeks after the first dose, whichever is later.
- Hep B vaccine may also be given in any of the following schedules: Birth, 1, & 6 mo, Birth, 6 and 14 weeks; 6, 10 and 14 weeks; Birth, 6, 10 and 14 weeks, etc. All schedules are protective.

#### Catch-up Vaccination:

- Administer the 3-dose series to those not previously vaccinated.
- In catch-up vaccination use 0, 1, and 6 months schedule.

### 3. Poliovirus Vaccines

#### Routine Vaccination:

- Birth dose of OPV usually does not lead to VAPP.
- OPV in place of IPV, if IPV is unfeasible, minimum 3 doses.
- Additional doses of OPV on all SIAs.
- IPV: Minimum age - 6 weeks.
- IPV: 2 instead of 3 doses can be also used if primary series started at 8 weeks and the interval between the doses is kept 8 weeks
- No child should leave your facility without polio immunization (IPV or OPV), if indicated by the schedule!!

#### Catch-up Vaccination:

- IPV catch-up schedule: 2 doses at 2 months apart followed by a booster after 6 months of previous dose.

### 4. Diphtheria and Tetanus Toxoids and Pertussis (DTP) Vaccine

#### Routine Vaccination:

- Minimum age: 6 weeks
- The first booster (4<sup>th</sup> dose) may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
- DTaP vaccine/combinations should preferably be avoided for the primary series.
- DTaP may be preferred to DTwP in children with history of severe adverse effects after previous dose/s of DTwP or children with neurologic disorders.
- First and second boosters may also be of DTwP. However, considering a higher reactogenicity, DTaP can be considered for the boosters.
- If any 'acellular pertussis' containing vaccine is used, it must at least have 3 or more components in the product.

#### Catch-up Vaccination:

- Catch-up schedule: The 2nd childhood booster is not required if the last dose has been given beyond the age of 4 years.
- Catch up below 7 years: DTwP/DTaP at 0, 1 and 6 months;

- Catch up above 7 years: Tdap, Td, and Td at 0, 1 and 6 months.

### 5. Tetanus and Diphtheria Toxoids and a Cellular Pertussis (Tdap) Vaccine

#### Routine Vaccination:

- Minimum age: 7 years (Adacel® is approved for 11-64 years by ACIP and 4 to 64 year olds by FDA, while Boostrix® for 10 years and older by ACIP and 4 years of age and older by FDA in US).
- Administer 1 dose of Tdap vaccine to all adolescents aged 11 through 12 years.
- Tdap during pregnancy: One dose of Tdap vaccine to pregnant mothers/adolescents during each pregnancy (preferred during 27 through 36 weeks gestation) regardless of number of years from prior Td or Tdap vaccination.

#### Catch-up Vaccination:

- Catch up above 7 years: Tdap, Td, Td at 0, 1 and 6 months.
- Persons aged 7 through 10 years who are not fully immunized with the childhood DTwP/DTaP vaccine series, should receive Tdap vaccine as the first dose in the catch-up series; if additional doses are needed, use Td vaccine. For these children, an adolescent Tdap vaccine should not be given.
- Persons aged 11 through 18 years who have not received Tdap vaccine should receive a dose followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter.
- Tdap vaccine can be administered regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.

### 6. Haemophilus influenzae Type b (Hib) Conjugate Vaccine

#### Routine Vaccination:

- Minimum age: 6 weeks
- Primary series includes Hib conjugate vaccine at ages 6, 10, 14 weeks with a booster at age 12 through 18 months.

#### Catch-up Vaccination:

- Catch-up is recommended till 5 years of age.
- 6-12 months; 2 primary doses 4 weeks apart and 1 booster;
- 12-15 months: 1 primary dose and 1 booster;
- Above 15 months: single dose.
- If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a final dose at age 12-18 months at least 8 weeks after the second dose

### 7. Pneumococcal Conjugate Vaccines (PCVs)

#### Routine Vaccination:

- Minimum age: 6 weeks
- Both PCV10 and PCV13 are licensed for children from 6 weeks to 5 years of age (although the exact labeling details may differ by country). Additionally, PCV13 is licensed for the prevention of pneumococcal diseases in adults >50 years of age
- Primary schedule (For both PCV10 and PCV13): 3 primary doses at 6, 10, and 14 weeks with a booster at age 12 through 15 months.

#### Catch-up Vaccination:

- Administer 1 dose of PCV13 or PCV10 to all healthy children aged 24 through 59 months who are not completely

vaccinated for their age.

- For PCV 13: Catch up in 6-12 months: 2 doses 4 weeks apart and 1 booster; 12-23 months: 2 doses 8 weeks apart; 24 mo & above: single dose
- For PCV10: Catch up in 6-12 months: 2 doses 4 weeks apart and 1 booster; 12 months to 5 years: 2 doses 8 weeks apart
- Vaccination of persons with high-risk conditions:
  - PCV and pneumococcal polysaccharide vaccine [PPSV] both are used in certain high risk group of children.
  - For children aged 24 through 71 months with certain underlying medical conditions, administer 1 dose of PCV13 if 3 doses of PCV were received previously, or administer 2 doses of PCV13 at least 8 weeks apart if fewer than 3 doses of PCV were received previously.
  - A single dose of PCV13 may be administered to previously unvaccinated children aged 6 through 18 years who have anatomic or functional asplenia (including sickle cell disease), HIV infection or an immunocompromising condition, cochlear implant or cerebrospinal fluid leak.
  - Administer PPSV23 at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions.

### 8. Pneumococcal Polysaccharide Vaccine (PPSV23)

- Minimum age: 2 years
- Not recommended for routine use in healthy individuals. Recommended only for the vaccination of persons with certain high-risk conditions.
- Administer PPSV at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions like anatomic or functional asplenia (including sickle cell disease), HIV infection, cochlear implant or cerebrospinal fluid leak.
- An additional dose of PPSV should be administered after 5 years to children with anatomic/functional asplenia or an immunocompromising condition.
- PPSV should never be used alone for prevention of pneumococcal diseases amongst high-risk individuals.
- Children with following medical conditions for which PPSV23 and PCV13 are indicated in the age group 24 through 71 months:
  - Immunocompetent children with chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure); chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy), diabetes mellitus; cerebrospinal fluid leaks; or cochlear implant.
  - Children with anatomic or functional asplenia (including sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, or splenic dysfunction);
  - Children with immunocompromising conditions: HIV infection, chronic renal failure and nephrotic syndrome, diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas and Hodgkin disease; or solid organ transplantation, congenital immunodeficiency.

### 9. Rotavirus (RV) Vaccines

#### Routine Vaccination:

- Minimum age: 6 weeks for both RV-1 [Rotarix] and RV-5 [RotaTeq].

- Only two doses of RV-1 are recommended at present.
- RV1 should preferably be employed in 10 and 14 week schedule, instead of 6 and 10 week; the former schedule is found to be far more immunogenic than the later
- If any dose in series was RV-5 or vaccine product is unknown for any dose in the series, a total of 3 doses of RV vaccine should be administered.

#### Catch-up Vaccination:

- The maximum age for the first dose in the series is 14 weeks, 6 days.
- Vaccination should not be initiated for infants aged 15 weeks, 0 days or older.
- The maximum age for the final dose in the series is 8 months, 0 days.

### 10. Measles

#### Routine Vaccination:

- Minimum age: 9 months or 270 completed days.

#### Catch-up Vaccination:

- Catch up vaccination beyond 12 months should be MMR
- Measles vaccine can be administered to infants aged 6 through 11 months during outbreaks. These children should be revaccinated with 2 doses of measles containing vaccines, the first at ages 12 through 15 months and at least 4 weeks after the previous dose, and the second at ages 4 through 6 years

### 11. Measles, Mumps and Rubella (MMR) Vaccine

#### Routine Vaccination:

- Minimum age: 12 months
- Administer the first dose of MMR vaccine at age 12 through 18 months, and the second dose at age 4 through 6 years.
- The second dose may be administered before age 4 years, provided at least 4 weeks have elapsed since the first dose.  
Catch-up vaccination:
- Ensure that all school-aged children and adolescents have had 2 doses of MMR vaccine; the minimum interval between the 2 doses is 4 weeks.
- One dose if previously vaccinated with one dose

### 12. Varicella Vaccine

#### Routine Vaccination:

- Minimum age: 12 months
- Administer the first dose at age 15 through 18 months and the second dose at age 4 through 6 years.
- The second dose may be administered before age 4 years, provided at least 3 months have elapsed since the first dose. If the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
- The risk of breakthrough varicella is lower if given 15 months onwards.

#### Catch-up Vaccination:

- Ensure that all persons aged 7 through 18 years without 'evidence of immunity' have 2 doses of the vaccine.
- For children aged 12 months through 12 years, the recommended minimum interval between doses is 3 months. However, if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
- For persons aged 13 years and older, the minimum interval between doses is 4 weeks.
- For persons without evidence of immunity, administer 2 doses if not previously vaccinated or the second dose if only 1 dose has been administered.

- Evidence of immunity' to varicella includes any of the following:
  - documentation of age-appropriate vaccination with a varicella vaccine
  - laboratory evidence of immunity or laboratory confirmation of disease
  - diagnosis or verification of a history of varicella disease by a health-care provider
  - diagnosis or verification of a history of herpes zoster by a health-care provider

### 13. Hepatitis A (HepA) Vaccines

#### Routine Vaccination:

- Minimum age: 12 months
- Start the 2-dose HepA vaccine series for children aged 12 through 23 months; separate the 2 doses by 6 to 18 months.
- Two doses of both killed and live Hepatitis A vaccines as of now

#### Catch-up Vaccination:

- Administer 2 doses at least 6 months apart to unvaccinated persons.
- For catch up vaccination, pre vaccination screening for Hepatitis A antibody is recommended in children older than 10 years as at this age the estimated sero-positive rates exceed 50%.

### 14. Typhoid Vaccines

#### Routine Vaccination:

- Both Vi-PS (polysaccharide) and Vi-PS conjugate vaccines are available
- Minimum ages:
  - Vi-PS (polysaccharide) vaccines: 2 years
  - Vi-PS (Typhar-TCV®): 6 months;
- Vaccination schedule:
  - Vi-PS (polysaccharide) vaccines: single dose at 2 years; revaccination every 3 years; (no evidence of hypo-responsiveness on repeated revaccination so far).
  - Vi-PS conjugate (Typhar-TCV® ): Single dose at 9-12 months and a booster during second year of life.
- Vi-PS Conjugate vaccine (PedaTyph®): data not sufficient to recommend for routine use.
- Greater experience and more robust data with Vi-PS polysaccharide vaccines; whereas there is limited experience with Vi-PS conjugate vaccines.

#### Catch-up Vaccination:

- Recommended throughout the adolescent period, i.e. 18 years.

### 15. Influenza vaccine

#### Routine Vaccination:

- Minimum age: 6 months for trivalent inactivated influenza vaccine (TIV)
- Recommended only for the vaccination of persons with certain high-risk conditions.
- First time vaccination: 6 months to below 9 years: two doses 1 month apart; 9 years and above: single dose
- Annual revaccination with single dose.
- Dosage (TIV) : aged 6–35 months 0.25 ml; 3 years and above: 0.5 ml
- For children aged 6 months through 8 years: For the 2012–13 season, administer 2 doses (separated by at least 4 weeks) to children who are receiving influenza vaccine for the first time.
- All the currently available TIVs in the country contain the 'Swine flu' or 'A (H1N1)' antigen; no need to vaccinate

separately.

- Best time to vaccinate:

- As soon as the new vaccine is released and available in the market
- Just before the onset of rainy season.

### 16. Human Papillomavirus (HPV) Vaccines

#### Routine Vaccination:

- Minimum age: 9 years
- HPV4 [Gardasil] and HPV2 [Cervarix] are licensed and available.
- Either HPV4 (0, 2, 6 months) or HPV2 (0, 1, 6 months) is recommended in a 3-dose series for females aged 11 or 12 years.
- HPV4 can also be given in a 3-dose series for males aged 11 or 12 years, but not yet licensed for use in males in India.
- The vaccine series can be started beginning at age 9 yrs.
- Administer the second dose 1 to 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).

#### Catch-up Vaccination:

- Administer the vaccine series to females (either HPV2 or HPV4) at age 13 through 45 years if not previously vaccinated.
- Use recommended routine dosing intervals (see above) for vaccine series catch-up.

### 17. Meningococcal Vaccine

- Recommended only for certain high risk group of children, during outbreaks, and international travelers, including students going for study abroad and travelers to Hajj and sub-Saharan Africa.
- Both Meningococcal conjugate vaccines (Quadrivalent MenACWY-D, Menactra® by Sanofi Pasteur and monovalent group A, PsA-TT, MenAfriVac® by Serum Institute of India) and polysaccharide vaccines (bi- and quadrivalent) are licensed in India. PsA-TT is not freely available in market.
- Conjugate vaccines are preferred over polysaccharide vaccines due to their potential for herd protection and their increased immunogenicity, particularly in children <2 years of age.
- As of today, quadrivalent conjugate and polysaccharide vaccines are recommended only for children 2 years and above. Monovalent group A conjugate vaccine, PsA-TT can be used in children above 1 year of age.

### 18. Cholera Vaccine

- Minimum age: one year (killed whole cell vibrio cholerae (Shanchol)
- Not recommended for routine use in healthy individuals; recommended only for the vaccination of persons residing in highly endemic areas and traveling to areas where risk of transmission is very high like Kumbh mela, etc.
- Two doses 2 weeks apart for >1 year old.

### 19. Japanese encephalitis (JE) Vaccine

#### Routine Vaccination:

- Recommended only for individuals living in endemic areas
- Three types of new generation JE vaccines are licensed in India : one, live attenuated, cell culture derived SA-14-14-2, and two inactivated JE vaccines, namely 'vero cell culture-derived SA 14-14-2 JE vaccine' (JEEV® by BE India) and 'vero cell culture-derived, 821564XY, JE vaccine' (JENVAC® by

Bharat Biotech)

- Live attenuated, cell culture derived SA-14-14-2:

- Minimum age: 8 months;
- Two dose schedule, first dose at 9 months along with measles vaccine and second at 16 to 18 months along with DTP booster
- Not available in private market for office use
- Inactivated cell culture derived SA-14-14-2 (JEEV® by BE India) :
  - Minimum age: 1 year (US-FDA: 2 months)
  - Primary immunization schedule: 2 doses of 0.25ml each administered intramuscularly on days 0 and 28 for children aged ≥ 1 to ≤ 3 years
  - 2 doses of 0.5 ml for children >3years and adults aged ≥ 18 years
  - Need of boosters still undetermined
- Inactivated Vero cell culture-derived Kolar strain, 821564XY, JE vaccine (JENVAC® by Bharat Biotech)
  - Minimum age: 1 year
  - Primary immunization schedule: 2 doses of 0.5 ml each administered intramuscularly at 4 weeks interval
  - Need of boosters still undetermined.

#### Catch up Vaccination:

- All susceptible children up to 15 yrs should be administered during disease outbreak/ahead of anticipated outbreak in campaigns

### 20. Rabies Vaccine

- Only modern tissue culture vaccines (MTCVs) and IM routes are recommended for both 'post-exposure' and 'pre-exposure' prophylaxis in office practice
- Post-exposure prophylaxis is recommended following a significant contact with dogs, cats, cows, buffaloes, sheep, goats, pigs, donkeys, horses, camels, foxes, jackals, monkeys, mongoose, bears and others. Rodent bites do not require post exposure prophylaxis in India.
- Post-exposure prophylaxis:
- MTCVs are recommended for all category II and III bites.
- Dose: 1.0 ml intramuscular (IM) in antero-lateral thigh or deltoid (never in gluteal region) for Human Diploid Cell Vaccine (HDCV), Purified Chick Embryo Cell (PCEC) vaccine, Purified Duck Embryo Vaccine (PDEV); 0.5 ml for Purified Vero Cell Vaccine (PVRV). Intradermal (ID) administration is not recommended in individual practice.
- Schedule: 0, 3, 7, 14, and 30 with day '0' being the day of commencement of vaccination. A sixth dose on day 90 is optional and may be offered to patients with severe debility or those who are immunosuppressed
- Rabies immunoglobulin (RIG) along with rabies vaccines are recommended in all category III bites.
- Equine rabies immunoglobulin (ERIG) (dose 40 U/kg) can be used if human rabies immunoglobulin is not available;
- Pre -exposure prophylaxis:
- Three doses are given intramuscularly in deltoid/ anterolateral thigh on days 0, 7 and 28 (day 21 may be used if time is limited but day 28 preferred).
- For re-exposure at any point of time after completed (and documented) pre or post exposure prophylaxis, two doses are given on days 0 and 3.
- RIG should not be used during re-exposure therapy.

# 'IAP Immunization Time Table 2013'

## I. IAP recommended vaccines for routine use

Age (completed weeks/ months/ years)	Vaccines	Comments
Birth	BCG OPV 0 Hep-B 1	Administer these vaccines to all newborns before hospital discharge
6 weeks	DTwP 1 IPV 1 Hep-B 2 Hib 1 Rotavirus 1 PCV 1	<p><b>DTP:</b></p> <ul style="list-style-type: none"> <li>DTaP vaccine/combinations should preferably be avoided for the primary series</li> <li>DTaP vaccine/combinations should be preferred in certain specific circumstances/ conditions only</li> </ul> <p><b>Polio:</b></p> <ul style="list-style-type: none"> <li>All doses of IPV may be replaced with OPV if administration of the former is unfeasible</li> <li>Additional doses of OPV on all supplementary immunization activities (SIAs)</li> <li>Two doses of IPV instead of 3 for primary series if started at 8 weeks, and 8 weeks interval between the doses</li> <li>No child should leave your facility without polio immunization (IPV or OPV), if indicated by the schedule</li> </ul> <p><b>Rotavirus:</b></p> <ul style="list-style-type: none"> <li>2 doses of RV1 and 3 doses of RV5</li> <li>RV1 should be employed in 10 &amp; 14 week schedule, instead of 6 &amp; 10 week</li> <li>10 &amp; 14 week schedule of RV1 is found to be far more immunogenic than existing 6 &amp; 10 week schedule</li> </ul>
10 weeks	DTwP 2, IPV 2 Hib 2, *Rotavirus 2 PCV 2	<p><b>Rotavirus:</b></p> <p>If RV1 is chosen, the first dose should be given at 10 weeks</p>
14 weeks	DTwP 3 IPV 3, Hib 3 *Rotavirus 3, PCV 3	<p><b>Rotavirus:</b></p> <p>Only 2 doses of RV1 are recommended at present. If RV1 is chosen, the 2nd dose should be given at 14 weeks</p>

Age (completed weeks/ months/ years)	Vaccines	Comments
6 months	OPV 1 Hep-B 3	<b>Hepatitis-B:</b> The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks and at least 16 weeks after the first dose.
9 months	OPV 2 Measles	Measles vaccine ideally should not be administered before completing 270 days or 9 months of life
12 months	Hep-A 1	<b>Hepatitis A:</b> For both killed and live hepatitis-A vaccines, 2 doses are recommended as of now
15 months	MMR 1 Varicella 1, PCV Booster	<b>Varicella:</b> The risk of breakthrough varicella is lower if given 15 months onwards
16 to 18 months	DTwP B1/DTaP B1 IPV B1 Hib B1	The first booster (4th dose) may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose. <b>DTP:</b> <ul style="list-style-type: none"> <li>First &amp; second boosters should preferably be of DTwP</li> <li>Considering a higher reactogenicity of DTwP, DTaP can be considered for the boosters</li> </ul>
18 months	Hep-A 2	<b>Hepatitis A:</b> For both killed and live hepatitis-A vaccines 2 doses are recommended as of now
2 years	Typhoid 1	<b>Typhoid:</b> Typhoid revaccination every 3 years, if Vi-polysaccharide vaccine is used.
4 to 6 years	DTwP B2/DTaP B2 OPV 3, MMR 2, Varicella 2, Typhoid 2	<p><b>MMR:</b> the 2nd dose can be given at anytime 4-8 weeks after the 1st dose.</p> <p><b>Varicella:</b> the 2nd dose can be given at anytime 3 months after the 1st dose.</p>
10 to 12 years	Tdap/Td HPV	<p><b>Tdap:</b> is preferred to Td followed by Td every 10 years.</p> <p><b>HPV:</b> Only for females, 3 doses at 0, 1-2 (depending on brands) and 6 months.</p>

## II. IAP recommended vaccines for High-risk\* children

### (Vaccines under special circumstances):

1. Influenza Vaccine,
2. Meningococcal Vaccine,
3. Japanese Encephalitis Vaccine
4. Cholera Vaccine,
5. Rabies Vaccine,
6. Yellow Fever Vaccine,
7. Pneumococcal Polysaccharide vaccine (PPSV 23)

### \* High-risk category of children:

- Congenital or acquired immunodeficiency (including HIV infection)
- Chronic cardiac, pulmonary (including asthma if treated with prolonged high-dose oral corticosteroids), hematologic, renal (including nephrotic syndrome), liver disease and diabetes mellitus
- Children on long term steroids, salicylates, immunosuppressive or radiation therapy
- Diabetes mellitus, Cerebrospinal fluid leak, Cochlear implant, Malignancies,
- Children with functional/ anatomic asplenia/ hyposplenia
- During disease outbreaks
- Laboratory personnel and healthcare workers
- Travelers