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	7-10Yr	11-12 Yr	13-18Yr
BCG	BCG															
Hep B	Hep B1	Hep B2					Hep B3									
Polio	OPV 0	IPV1	IPV2	IPV3		OPV1	OPV2	IPV B1					OPV3			
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												
MMR							MMR 1		MMR 2							
Varicella									VAR 1				VAR 2			
Hep A								Hep A1 & Hep A2								
Typhoid							Typhoid CV (TCV)					Booster				
Influenza						Influenza (yearly)										
HPV															HPV	
Meningococcal													Meningococcal			
Cholera								Cholera 1 & 2								
JE								Japanese Encephalitis								
Rabies	Rabies (Pre-EP & PEP)															

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

- This schedule includes recommendations in effect as of September 2014.
- 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 Fig. 1

FIG. 1 *IAP Recommended immunization schedule for children aged 0-18 years (with range), 2014.*

Footnotes: Recommended Immunization Schedule for Persons Aged 0 through 18 Years — IAP, 2014

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
- Any interval can be kept between live and inactivated vaccines.
- If given <4 weeks apart, the vaccine given 2nd should be repeated
- The minimum interval between 2 doses of same inactivated vaccines is usually 4 weeks (exception rabies). However, any interval can be kept between doses of different inactivated vaccines.
- 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 non-standard 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 (3rd or 4th) 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 (4thth 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.
- No need of repeating/giving additional doses of whole-cell pertussis (wP) vaccine to a child who has earlier completed their primary schedule with acellular pertussis (aP) vaccine-containing products

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 acellular 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:**
  - o PCV and pneumococcal polysaccharide vaccine [PPSV] both are used in certain high risk group of children.
    - o 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.
    - o 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.
    - o 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:**
  - o Immunocompetent children with chronic heart disease (particularly cya-notic 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.
  - o Children with anatomic or functional asplenia (including sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, or splenic dysfunction);
  - o Children with immuno-compromising 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, mumps, and rubella (MMR) vaccine

Routine vaccination:

- Minimum age: 9 months or 270 completed days.
- Administer the first dose of MMR vaccine at age 9 through 12 months, and the second dose at age 15 through 18 months.
- The 2nd dose must follow in 2nd year of life. However, it can be given at anytime 4-8 weeks after the 1st dose
- No need to give stand-alone measles vaccine

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
- 'Stand alone' measles/measles containing vaccine can be administered to infants aged 6 through 8 months during outbreaks. However, this dose should not be counted.

11. 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

12. Hepatitis A (HepA) vaccines

Routine vaccination:

- Minimum age: 12 months
- Killed HepA vaccine: Start the 2-dose HepA vaccine series for children aged 12 through 23 months; separate the 2 doses by 6 to 18 months.
- Live attenuated H2-strain Hepatitis A vaccine: Single dose starting at 12 months and through 23 months of age

Catch-up vaccination:

- Either of the two vaccines can be used in 'catch-up' schedule beyond 2 years of age
- Administer 2 doses for killed vaccine at least 6 months apart to unvaccinated persons
- Only single dose of live attenuated H2-strain vaccine
- 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%.

13. Typhoid vaccines

Routine vaccination:

- Both Vi-PS conjugate and Vi-PS (polysaccharide) vaccines are available
- Minimum ages:
  - o Vi-PS (Typbar-TCV®): 6 months;
  - o Vi-PS (polysaccharide) vaccines: 2 years
- Vaccination schedule:
- *Typhoid conjugate vaccines (Vi-PS):* Single dose at 9-12 through 23 months and a booster during second year of life
- *Vi-PS (polysaccharide) vaccines:* Single

dose at 2 years; revaccination every 3 years;
- Currently, two typhoid conjugate vaccines, Typbar-TCV® and PedaTyph® available in Indian market;
- PedaTyph® is not yet approved; the recommendation is applicable to Typbar-TCV® only
- An interval of at least 4 weeks with the MMR vaccine should be maintained while administering Typbar-TCV® vaccine
- Primary dose of conjugate vaccine should follow a booster at 2 years of age
- Either Typbar-TCV® or Vi-polysaccharide (Vi-PS) can be employed as booster;
- Typhoid revaccination every 3 years, if Vi-polysaccharide vaccine is used
- No evidence of hypo-responsiveness on repeated revaccination of Vi-polysaccharide vaccine so far
- Need of revaccination following a booster of Typbar-TCV® not yet determined

Catch-up vaccination:
- Recommended throughout the adolescent period, i.e. 18 years

14. 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: 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:
  o As soon as the new vaccine is released and available in the market
  o Just before the onset of rainy season.

15.Human papillomavirus (HPV) vaccines

Routine vaccination:
- Minimum age: 9 years
- HPV4 [Gardasil] and HPV2 [Cervarix] are licensed and available.
- Only 2 doses of either of the two HPV vaccines (HPV4 & HPV2) for adolescent/ preadolescent girls aged 9-14 years;
- For girls 15 years and older, and immunocompromised individuals 3 doses are recommended
- For two-dose schedule, the minimum interval between doses should be 6 months.
- Either HPV4 (0, 2, 6 months) or HPV2 (0, 1, 6 months) is recommended in a 3-dose series for females aged 15 years and older
- 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 years.
- For three-dose schedule, administer the 2nddose 1 to 2 months after the **1st**dose and the 3rddose 6 months after the **1st**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.

16. 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-Sahara 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.

17. Cholera Vaccine.
- Minimum age: one year (killed whole cell vibrio cholera (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.

18. Japanese encephalitis (JE) vaccine.

Routine vaccination:
- Recommended only for individuals living in endemic areas
- The vaccine should be offered to the children residing in rural areas only and those planning to visit endemic areas (depending upon the duration of stay)
- 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:**
  o Minimum age: 8 months;
  o Two dose schedule, first dose at 9 months along with measles vaccine and second at 16 to 18 months along with DTP booster
  o Not available in private market for office use
- **Inactivated cell culture derived SA-14-14-2 (JEEV® by BE India) :**
  o Minimum age: 1 year (US-FDA: 2 months)
  o Primary immunization schedule: 2 doses of 0.25ml each administered intramuscularly on days 0 and 28 for children aged ≥ 1 to ≤ 3 years
  o 2 doses of 0.5 ml for children >3years and adults aged ≥ 18 years
  o Need of boosters still undetermined
- **Inactivated Vero cell culture-derived Kolar strain, 821564XY, JE vaccine (JENVAC® by Bharat Biotech)**
  o Minimum age: 1 year
  o Primary immunization schedule: 2 doses of 0.5 ml each administered intramuscularly at 4 weeks interval
  o 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

19. Rabies vaccine:
- Practically all children need vaccination against rabies
- Following two situations included in 'high-risk category of children' for rabies vaccination and should be offered 'Pre-exposure prophylaxis' (Pre-EP):
  o Children having pets in home;
  o Children perceived with higher threat of being bitten by dogs such as hostellers, risk of stray dog menace while going outdoor.
- 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 (PEP) is recommended following a significant contact with dogs, cats, cows, buffaloes, sheep, goats, pigs, donkeys, horses, camels, foxes, jackals, monkeys, mongoose, squirrel, bears and others. Domestic rodent (rat) bites do not require post exposure prophylaxis in India.
- *Post-exposure prophylaxis:*
  o MTCVs are recommended for all category II and III bites.
  o *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.
  o *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
  o Rabies immunoglobin (RIG) along with rabies vaccines are recommended in all category III bites.
  o Equine rabies immunoglobin (ERIG) (dose 40 U/kg) can be used if human rabies immunoglobin is not available;
- *Pre -exposure prophylaxis:*
  o 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).
  o 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.
  o RIG is not required during re-exposure therapy.