INDIAN CONSENSUS GUIDELINE ON ADULT IMMUNIZATION

Editors:
Dr. Girish Mathur
Dr. Agam Vora

In Association with

- Cardiological Society of India (CSI)
- Clinical Infectious Diseases Society (CIDS)
- Federation of Obstetric and Gynecological Societies of India (FOGSI)
- Geriatric Society of India (GSI)
- Heart Failure Association of India (HFAI)
- Indian Association of Preventive and Social Medicine (IAPSM)
- Indian Chest Society (ICS)
- Indian Medical Association (IMA)
- Indian Rheumatology Association (IRA)
- Indian Society of Critical Care Medicine (ISCCM)
- Indian Society of Nephrology (ISN)
- Indian Society of Oncology (ISO)
- Research Society for Study of Diabetes in India (RSSDI)

Preface

It is with immense pride and a sense of accomplishment that we present to you a monumental stride in the realm of healthcare – Indian Consensus Guideline on Adult Immunization developed by the Association of Physicians of India (API).

This endeavour marks a historic collaboration, bringing together representatives from 13 diverse professional organizations namely Cardiological Society of India, Clinical Infectious Disease Society, Federation of Obstetric & Gynaecological Societies of India, Geriatric Society of India, Heart Failure Association of India, Indian Association of Preventive & Social Medicine, Indian Chest Society, Indian Medical Association, Indian Rheumatology Association, Indian Society of Critical Care Medicine, Indian Society of Nephrology, Indian Society of Oncology, Research Society of Study of Diabetes in India. For the first time, these collective efforts converge to address a crucial aspect of public health – adult immunization.

As we navigate the complexities of healthcare in India, it is evident that the landscape is evolving rapidly. The emergence of new medical challenges, coupled with the increasing geriatric population, necessitates a proactive approach to immunization. With projections indicating that nearly 23% of our population will belong to the 50-plus age group by the end of the next decade, the significance of adult immunization cannot be overstated.

The myths and misconceptions surrounding adult vaccination persist, both among citizens and healthcare providers. It is against this backdrop that API has been actively engaged in the field for over a decade. We have published guidelines, disseminated knowledge through articles in our esteemed Journal (JAPI), and now, with these Consensus Guideline, we aim to bridge the existing gaps in understanding and implementation.

Under the astute leadership of Dr. Girish Mathur, representatives from various medical associations convened, engaging in rigorous brainstorming sessions, comprehensive literature reviews, and meticulous comparisons of national and international guidelines. The outcome is a comprehensive resource that not only addresses the concerns of healthcare providers but also provides clear, consensus-based recommendations for each vaccine.

These guideline delve into the specifics of each available vaccine, offering insights into recommended practices and providing a unified voice amid the existing plethora of guidelines. We acknowledge the challenges healthcare workers face, particularly when managing patients with multiple co-morbidities. Hence, these guideline offer a consolidated approach, ensuring clarity in decision-making for healthcare providers.

As the Secretary of the Association of Physicians of India, I extend my gratitude to all the contributors, collaborators, and stakeholders who have played a pivotal role in making this initiative a reality. Your dedication and commitment to advancing healthcare in our nation are commendable.

I invite you to delve into this Consensus Guideline, share your insights, and actively participate in the ongoing dialogue. Your feedback is invaluable as we strive to continually update and enhance this guideline to meet the dynamic healthcare landscape.

Wishing you an enlightening and enriching journey through these guidelines.

Warm regards,

Dr. Agam Vora
Secretary General
Association of Physicians of India

Dr. Girish Mathur
Immediate Past President
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Inauguration of the Indian Consensus Guideline
on Adult Immunization by
the honourable Vice President of India

Shri Jagdeep Dhankhar

on the 22nd February at APICON 2024, New Delhi, India
in the presence of **Dr. Girish Mathur, Dr. Milind Nadkar,**
Dr. Rajesh Upadhyay, and **Dr. Agam Vora.**

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Ex Chair, Reproductive Endocrinology and Infertility Committee – Asia Oceania Federation of Obstetrics and Gynecology (AOFOG)

Ex Chairman, MTP committee (FOGSI) 2004 - 09.

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President – Mumbai Obstetrics and Gynaecological Society - MOGS (2016-2017)

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Contents

Introduction

One of the most economical public health measures now accessible is vaccination. Vaccines help protect the community by halting the transmission of infectious diseases, in addition to preventing the vaccinated person from contracting a potentially serious illness. Immunization is a tried and tested method of managing and eradicating infectious diseases that can be fatal. Furthermore, vaccination is estimated to help avert between 2 and 3 million deaths annually.[1] It is one of the health initiatives with the highest return on investment, and it can reach even the most vulnerable populations.

India has had a well-defined pediatric immunization schedule active since 1978. It is one of the biggest vaccination campaigns in the world and is called the 'Universal Immunization Program' (UIP).

Every year, the UIP aims to immunize about 2.7 crore newborns with all primary doses and an additional 10 crore children between the ages of one and five with booster doses. Additionally, TT vaccinations are given to almost 3 crore expectant mothers annually. The beneficiaries are immunized as part of 90 lakh vaccination sessions annually.

The Government of India (GoI) observes 16 March as National Vaccination Day to celebrate the efforts towards paediatric vaccination. Considerable work is done in this field to protect our children from Vaccine-Preventable Diseases (VPD). That said, adult vaccination is an area that is greatly neglected.

The prevalence of diabetes and other metabolic Non-communicable Diseases (NCDs) in India is significantly higher than previously believed. Although the diabetes epidemic appears to be stabilizing in the more developed states of the country, it continues to rise in most other states.[2]

NCDs are associated with increased risk of infection and related hospitalizations and deaths. This situation has serious implications for the nation, highlighting the need to evaluate the need for adult vaccination.

The need for adult immunization is crucial to protect individuals from vaccine-preventable diseases and reduce the burden of illness in the adult population. Here are some key reasons highlighting the importance of adult immunization:

- Vaccines are effective in preventing various infectious diseases, including but not limited to influenza, pneumonia, Shingles (Herpes Zoster), hepatitis, and tetanus.
- VPD can lead to serious health complications, hospitalizations, and even death, particularly in older adults or those with underlying health conditions.
- When a significant portion of the population is immunized, it creates herd immunity, which provides indirect protection to those who are unable to receive vaccines due to medical conditions or age.
- Vaccines not only protect individuals but also help in reducing the transmission of infectious diseases.
- Adult immunization plays a crucial role in maintaining a healthy workforce and preventing disease outbreaks in community settings.
- As individuals age, their immune systems may weaken, making them more susceptible to infections.
- As life expectancy increases and healthcare becomes more accessible, the percentage of the population that is elderly also increases. Given that vaccine-preventable diseases are more likely to be contracted as a result of this demographic shift, immunization campaigns are crucial for

  reducing the risks infectious pathogens pose to the public health.

- International travel exposes individuals to different infectious diseases prevalent in other countries.

There is a pressing need to address the issue of adult immunization in India. While several aspects concerning the effectiveness, safety, and financial implications of implementing adult vaccines at a national scale remain unresolved, raising awareness among health planners and healthcare providers about this important issue is important. Most major health societies in India have rolled out their respective adult vaccine programs, however, a standardized schedule for adults is lacking. This is an attempt to have a standardized schedule that one may refer to for adult immunization and a call to the Government of India (GoI) for inclusion of adult immunization in the 'UIP' with focus on specific high-risk subgroups in increased need of immunization; also, inclusion under reimbursement and insurance (both public and private sector) schemes can play an important role as a milestone in making this dream a reality in the foreseeable future. Since the field of medicine is constantly evolving, physicians are advised to consult the most recent locally approved summary of product characteristics (SmPC) or prescribing information before administering any vaccine.

While every effort was made to provide the most stringent guidance to a clinician for appropriate use of vaccines, local or regional outbreaks similar to the one experienced during the COVID-19 pandemic can take us all by surprise, so one is always advised to refer to the local, regional or national guidance for managing loco-regional outbreaks.

Harmonization of Adult Immunization in India

The synchronization of vaccination guidelines in India from different medical societies marks a significant step towards developing a rational and systematic approach to vaccination. By aligning recommendations and protocols from different medical societies, the aim is to formulate consistent and clear guidance for healthcare professionals and the public. Representatives from multiple medical societies in India were invited to brainstorm and collaborate to come out with a harmonized guidance document that one may refer to in times of need. Medical societies invited include Indian Medical Association (IMA), Research Society for the Study of Diabetes in India (RSSDI), Geriatric Society of India (GSI), Indian Society of Nephrology (ISN), Indian Society of Critical Care Medicine (ISCCM), Indian Chest Society (ICS), Indian Rheumatology Association (IRA), Heart Failure Association of India (HFAI), Cardiological Society of India (CSI), The Federation of Obstetric and Gynaecological Societies of India (FOGSI), Clinical Infectious Diseases Society (CIDS), Indian Society of Oncology (ISO) and Indian Association of Preventive and Social Medicine (IAPSM).

This concerted initiative does not merely streamline vaccine distribution, administration and monitoring, but also amplifies India's potential to aptly deal with public health challenges, creating a platform for open communication and knowledge sharing between medical societies. The establishment of a central coordination body with representatives from different societies optimized the synthesis of this guidance document. Government involvement is ess

essential to create a regulatory framework that promotes collaboration and standardization. All reasonable efforts will be made to obtain endorsement for adult vaccination as a standard procedure, allowing its integration into national and state-level policies for the efficient application of protocols.

Method of Consensus Development

Through the use of the Nominal Group Consensus methodology, these harmonization efforts guarantee an inclusive decision-making process in which the opinions of all stakeholders are heard. This encourages a fairer and better-informed consensus by preventing any one viewpoint from overshadowing others. Currently, there can be confusion due to the disparate vaccination recommendations from multiple societies.

Recognizing the urgent need for collaboration, the Association of Physicians of India brought together various societies (as mentioned above) and their representatives for this harmonization project. Stakeholders addressed the unique needs of various patient groups served by different specialties in a series of in-person and virtual roundtable discussions, offering input in person or via email. A thorough literature review was conducted in the hope of creating unified immunization guidance for India, with a focus on adult immunization and future vaccines.

Through this initiative, national immunization programs were to be in line with international guidelines, such as those provided by the Center for Disease Control (USA) and World Health Organization (WHO). The literature review has established a strong basis for the creation of unified vaccination recommendations in India by incorporating important themes. Using a comprehensive approach guarantees that the recommendations not only tackle the issues surrounding adult vaccination today, but also continue to be flexible in response to changes in the field of vaccine development and international immunization programs. The consensus gains a practical aspect from the collaboration of medical societies, which makes them applicable and efficient in the various healthcare environments throughout the nation.

High Risk Group

In the adult population, a subgroup with a high risk of vaccine-preventable diseases, are individuals with compromised immune systems, such as those suffering from conditions like Human Immunodeficiency Virus (HIV) | Acquired Immunodeficiency Syndrome (AIDS), neoplastic disorders, or post-transplantation states.

Additionally, adults harbouring chronic medical disorders, including cardiovascular, hepatic metabolic, or respiratory disorders, are at an increased risk of serious outcomes following an infection. Advancing years, particularly beyond 65, increases vulnerabilities to certain diseases. Chronic alcoholics (referred to as alcoholism in the tables below) are at risk of a weakening immune system and developing hepatic

disorders, making them susceptible to infectious diseases. Healthcare professionals, due to their occupational exposure, and travelers to regions where particular diseases are endemic, also fall within this high-risk group, warranting specialized vaccination strategies. For all these reasons, vaccination is crucial for protecting from illnesses that may have serious consequences on an individual's health.

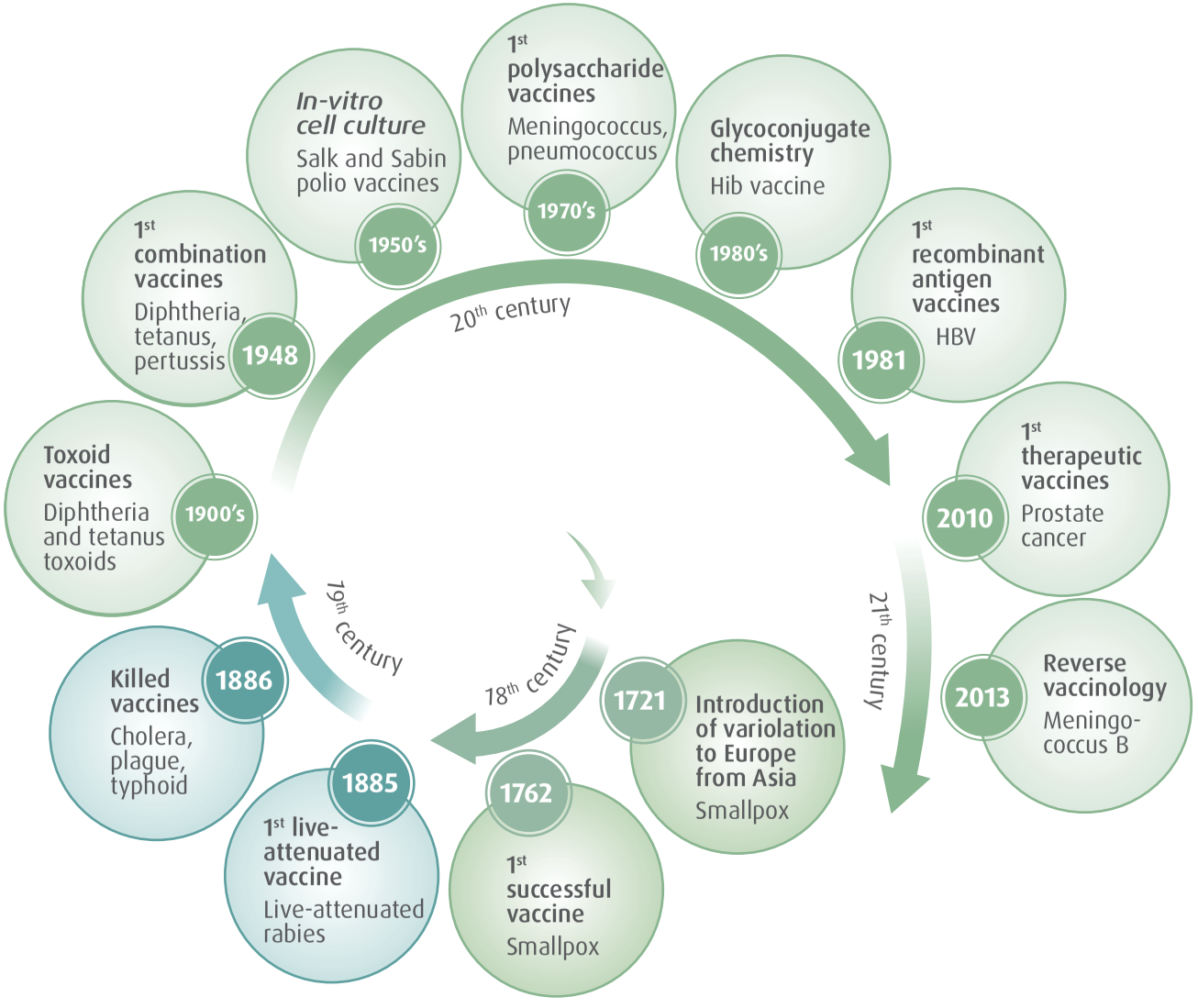
What are Vaccines?

Vaccines are biological substances that stimulate the immune system to develop immunity against specific diseases. They are typically composed of weakened or inactivated forms of pathogens (such as bacteria or viruses), or fragments of those pathogens. Vaccines can also contain synthetic components that mimic the structure of the pathogen.[3]

Types of Vaccines Available

1. Live Attenuated Vaccines
2. Inactivated or Dead Vaccines
3. Acellular or Subunit Vaccines
   a. Toxoid Vaccines
   b. Conjugate Vaccines
   c. Split Virion Vaccine
   d. Protein Subunit Vaccines
4. Recombinant Vaccines
   a. mRNA vaccines
   b. pDNA vaccines
5. Viral Vector vaccines

Figure 1. Vaccines development journey[5]



List of vaccines discussed in this consensus

1. Anthrax	18. Rabies
2. Chickenpox	19. Respiratory Syncytial Virus
3. Chikungunya	20. Measles
4. Cholera	21. Mumps
5. Corona Virus Disease 2019	22. Rubella
6. Diphtheria 7. Pertussis 8. Tetanus	23. Typhoid
9. Haemophilus Influenzae Type B	24. Shingles (Herpes Zoster)
10.Hepatitis A	25. Yellow Fever
11. Hepatitis B	
12. Human Papilloma Virus	
13. Influenza	
14.Japanese Encephalitis	
15. Meningococcal 16. Pneumococcal 17. Poliomyelitis	

Inactivated vaccines	Live-attenuated vaccines	mRNA | pDNA vaccines	Subunit, recombinant, polysaccharide, and conjugate vaccines	Toxoid vaccines	Viral vector vaccines
Hep A Influenza (Injectable only) Polio (Injectable only) Rabies	Chickenpox Chikungunya Influenza Japanese Encephalitis MMR Smallpox Yellow fever	COVID-19	Hib Hep B HPV Pertussis (Tdap) Pneumococcal Meningococcal Shingles (Herpes Zoster)	Diphtheria Tetanus	COVID-19

Anthrax

Vaccine type: Cell-free filtrates of microaerophilic cultures of an avirulent, nonencapsulated strain of Bacillus anthracis. Live Attenuated Vaccine

Route of administration: Intramuscular (IM) for preexposure | Subcutaneous (SC) for postexposure

Dose: 0.5 mL | 0, 1, and 6 months | Booster if risk persists: 6 months after primary dose series

Storage: 2°C – 8°C

Guideline recommendations for Anthrax Vaccine in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14,15]
-	-	-	-	-	-	-	People at increased risk of exposure or have been exposed

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
NR	NR	NR	NR	NR	BR	BR	BR	BR	BR	BR	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Not recommended for general use, should only be used in people at increased risk of exposure or in people who have been exposed
  - Livestock handlers in endemic areas
  - Laboratory workers at risk of exposure
- Pre-exposure prophylaxis for adults aged 18–65 years at high risk for exposure, intramuscularly (IM) at 0, 1, and 6 mo. with boosters at 6 and 12 mo. after completion of the primary series and at 12-month intervals thereafter if the risk persists
- Post-exposure prophylaxis in combination with antimicrobials for adults aged 18–65 years with suspected or known exposure subcutaneously (SC) at 0, 2, and 4 weeks

Chickenpox

Vaccine type: Live attenuated

Route of administration: Intramuscular injection (IM)

Dose: 2 doses 0.5 ml at least 4-8 weeks apart

Storage: Should be stored between 2°C and 8°C.

Guideline recommendations for Chickenpox vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
At risk -OR- No evidence of immunity	At risk	Recommended	At risk	If no evidence of immunity	Preconception or not recommended during pregnancy	At risk	At risk

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
NR	NR	NR	NR	R	R	R	R	R	R	NR	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Routinely recommended in adults without evidence of immunity
- Recommended in adults who are at potential risk of exposure such as Individuals or students residing in hostel, HCPs and household contacts
- Post-exposure vaccination: Recommended within a few days to a few weeks of exposure.
  - Incomplete vaccination: One dose
  - Not-vaccinated: Two doses

Chikungunya

On the 9th of November '23, USFDA approved the first chikungunya vaccine, for individuals 18 years of age and older who are at increased risk of exposure to chikungunya virus; following two clinical studies conducted in North America in which about 3,500 participants 18 years of age and older received a dose of the vaccine with one study including about 1,000 participants who received a placebo.[16]

Vaccine type: Live attenuated

Route of administration: Intramuscular injection (IM)

Dose: 0.5 mL | 1 dose

Storage: Should be stored between 2°C and 8°C.

Contraindication: History of allergic reaction to any component of the vaccine, immunodeficient or Immunosuppressed due to disease or medical therapy (e.g., from hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, long-term immunosuppressive therapy or patients with HIV infection who are severely immunocompromised).

Guideline recommendations for Chikungunya vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
-	-	-	-	-	-	-	-

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
R	NR	NR	NR	NR	BR	BR	BR	BR	BR	R	BR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- For individuals 18 year or older at increased risk of exposure to chikungunya virus

****Not yet approved | available for clinical use in India****

Cholera

	Killed Whole-Cell Monovalent (O1) Vaccine with a Recombinant Cholera Toxin B Subunit WC-rBS	Killed Whole-Cell Bivalent (O1 and O139) Vaccine without the Cholera Toxin B Subunit BivWC	Killed Whole-Cell Bivalent (O1 and O139 without Cholera Toxin B Subunit) BivWC	Live Attenuated Vaccine CVD 103-HgR
Route of administration	Oral	Oral	Oral	Oral
Recommended age of vaccination	2 doses in adults and children ≥6 years of age, 3 doses for children aged <6 years; ≥1 week before potential exposure 2 doses in adults and children ≥6 years of age, 3 doses for children aged <6 years; ≥1 week before potential exposure	2 doses at an interval of 2 weeks; earliest onset of protection 7–10 days after completion	2 doses at an interval of 2 weeks	Single dose; ≥10 days before potential exposure
Recommended age of vaccination	Adults and children ≥2 years of age	Adults and children ≥1 year of age	Adults and children ≥1 year of age	Adults and children aged ≥6 years

Cholera

Route of administration: Oral

Storage: Should be stored between 2°C and 8°C.

Guideline recommendations for Cholera vaccine in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
18–65 years (1 dose if traveling to an endemic region)	-	2 doses 1-6 weeks apart	-	At risk (2 doses)	-	All age groups (In a resource-limited set up prioritize high-risk group)	18–65 years (1 dose if traveling to an endemic region)

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
NR	NR	NR	NR	NR	NR	NR	NR	NR	BR	R	R

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Routine administration is not recommended
- Recommended as 2 doses, at least 2 weeks apart only in:
  - Travelers
  - Potential exposure to cholera patients
  - Exposure to contaminated water and food, particularly those staying in areas with limited access to health care facilities
  - During natural calamity
  - During endemic|outbreak

List of COVID-19 Vaccines Approved by CDSCO in India[17]

Vaccine	Age group and dosing schedule	Route & storage
ChAdOx1 nCoV-19 Corona Virus vaccine Recombinant) (COVISHIELD)	For ≥18 years age Two doses, 4 to 6 weeks apart (Overseas Data available for 12 weeks)	Intramuscular, 2-8°C
Whole-Virion Inactivated SARS-CoV-2 Vaccine (COVAXIN)	For ≥18 years age Two doses, Day 0 & 28	Intramuscular, 2-8°C
Gam COVID Vac (component I & II) (SPUTNIK-V)	For ≥18 years age Two doses, Day 0 (comp I) & Day 21 (comp II)	Intramuscular, -18°C
mRNA-1273COVID-19 vaccine (Moderna vaccine)	For ≥18 years age Two doses, Day 0 & 28	Intramuscular, -25°C to -15°C
COVID-19 vaccine (Ad26.COV2-S) [recombinant] (Janssen Vaccine)	For ≥18 years age Single dose	Intramuscular, -25°C to -15°C & 2-8°C
Novel Corona Virus-2019-nCov vaccine (recombinant DNA) (ZyCoV-D)	For ≥12 years age Three doses (Day 0, 28 and 56)	Intradermal, 2-8°C
Gam COVID Vac (component I & II) (SPUTNIK-V)	For ≥18 years age Two doses, Day 0 (comp I) & Day 21 (comp II)	Intramuscular, -18°C
Whole-Virion Inactivated SARS-CoV-2 Vaccine (COVAXIN)	For 12 to 18 years age Two doses, Day 0 & 28	Intramuscular, 2-8°C
	>6 to <12 years Two doses, Day 0 & 28	
SARS-CoV-2 vaccine containing Receptor Binding Domain (RBD) of SARS-CoV-2 gene (CORBEVAX)	For ≥18 years age Two doses, Day 0 & 28	Intramuscular, 2-8°C
	For ≥12 years age Two doses, Day 0 & 28	
	>5 to <12 years – Two doses, Day 0 & 28	
SARS-CoV-2 rS Protein (COVID-19) recombinant spike protein Nanoparticle Vaccine [COVOVAX]	For ≥18 years age Two doses, Day 0 & 21	Intramuscular, 2-8°C
	For ≥12 years age Two doses, Day 0 & 21	
Recombinant adenoviral vector vaccine containing particles of S gene of the SARS-CoV-2 virus (SPUTNIK Light)	For ≥18 years age Single dose	Intramuscular, -18°C
Lyophilized mRNA Vaccine for Injection (COVID-19) [HGCO-19]	For ≥18 years of age Two doses, Day 0 & 28	Intramuscular, 2-8°C
BBV154 - Adenovirus vectored, intranasal vaccine (iNCOVACC)	For ≥18 years of age	Intranasal

Corona Virus Disease 2019 (COVID-19)

Guideline recommendations for COVID-19 vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
2-dose series followed by booster in special situations	-	At risk (2 doses)	-	-	2-dose series even during pregnancy	2-dose series followed by booster in special situations	2 or 3 dose series followed by booster in special situations

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
R	R	R	R	R	R	R	R	R	R	R	R

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- At the time of pandemic or local epidemic situations: Routine administration is strongly recommended for all, even during pregnancy – 2 doses – at least 4 weeks apart
- Additional booster doses: for all older adults and adults with significant comorbidities or severe obesity (high priority-use group) – At least 12 mo. after the previous dose

Note:

- The recommendations for use are limited to pandemic or local epidemic situations only. Please refer to the latest government recommendations for the frequency of repeat| booster doses.
- There are no head-to-head to head studies comparing the different vaccines available for the prevention of COVID-19, please check local availability and the most recent government notification for the selection of vaccine.

Diphtheria, Pertussis and Tetanus (Tdap)

Vaccine type: Tdap: Diphtheria and tetanus toxoids and acellular pertussis antigens | Td: Diphtheria (reduced dose) and tetanus toxoids

Route of administration: Intramuscular injection (IM)

Dose: 0.5 ml | 1 dose 10 yearly

Storage: Should be stored between 2°C and 8°C.

Contraindication: History of allergic reaction

Guideline recommendations for Tdap vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
If not vaccinated immediately, then every 10 years	Recommended	**1.** If not vaccinated, 3 doses of Td at 0,1 and 6-12 mo. apart, TdaP can be used as one of the doses, then every 10 yrs. **2.** For age ≥65 yrs administer the first dose of TdaP followed by Td every 10 yrs.	Tdap for all adults aged 65 years and older	If not vaccinated immediately, then every 10 years	Pre-conceptional period if at risk Tdap during pregnancy	If not vaccinated immediately, then every 10 years. During pregnancy 2 doses of TT	If not vaccinated immediately, then every 10 years

Indian Consensus Recommendations:

Vaccine	Age ≥50 yrs	Age 18 - 49 years										
		Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
Td	R	BR	R	R	R	R	R	R	R	R	R	R
Tdap	BR	R	BR	BR	BR	BR	BR	BR	BR	BR	R	BR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Un-vaccinated: 1 dose of Tdap, then 1 dose of Td or Tdap 4 weeks later, and a third dose of Td or Tdap 6–12 mo. later (Tdap preferred as the first dose), with Td or Tdap every 10 years thereafter.
- During each pregnancy, it is recommended to receive one dose of Tdap, preferably between the gestational weeks of 27 and 36.
- Wound management: 3+ doses of tetanus-toxoid vaccine - Tdap|Td if >10 years since last dose for clean|minor wounds, >5 years for other wounds. Prefer Tdap for those without previous Tdap history.

Haemophilus influenzae type b (Hib) infection

Vaccine type: Lyophilized killed | Conjugate Vaccine (capsular polysaccharide bound to carrier protein)
Available as: Pentavalent|bivalent combination or hexavalent injection

Route of administration: Intramuscular injection (IM)

Dose: 0.5 ml | 1 dose | For HSCT Recipients 3 doses at least 4 weeks apart

Storage: Should be stored between 2°C and 8°C.

Guideline recommendations for Hib vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
At risk* (1 or 3 doses)	-	At risk* (1 dose)	-	At risk* (1 or 3 doses)	-	Not recommended	At risk* (1 or 3 doses)

***At Risk:** asplenia, HIV, hematological malignancies, corticosteroid use, CSF leak, trauma, diabetes, pregnancy, alcoholism, immunosuppression due to bone marrow or kidney transplant, cancer, radiation, or chemotherapy should be vaccinated.

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
R	-	R (3 doses for HSCT)	AR	AR	R	R	R	R	NR	NR	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Vaccination is a part of primary immunization
- Adults at high risk such as patients with immunocompromised state, CSF leak, trauma, diabetes, pregnancy, alcoholism, cancer, radiation, or chemotherapy: 1 dose
- Elective splenectomy If unvaccinated: 1 dose (at least 14 days before splenectomy)
- Functional or anatomic asplenia If unvaccinated: 1 dose
- HSCT Recipients: 3 doses at least 4-week intervals; 6–12 mo. after transplant, regardless of Hib vaccine history

Hepatitis A

Available vaccines and relevant population to receive them.

Protects against	Dosing schedule	Relevant populations
HAV	Two doses 6 mo. apart	Age 19 years and above
HAV	Two doses 6 mo. apart	Travel to endemic area

Vaccine type: Inactivated vaccine

Route of administration: Intramuscular injection (IM)

Dose: 0.5 ml | 2 doses, 6 months apart

Storage: Should be stored between 2°C and 8°C.

Contraindicated during pregnancy

Guideline recommendations for HepA vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
At risk* (2 doses, 6 mo. apart)	Recommended	At risk* (2 doses, 6 mo. apart)	-	Adults (1 dose of live or 2 doses of inactivated at 0 & 6 mo.)	-	Not recommended	At risk* (1 or 3 doses)

***At Risk:** Chronic liver disease (e.g., persons with hepatitis B, hepatitis C, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice the upper limit of normal), Undergoing liver transplant, HIV infection, Men who have sex with men, Injection or non-injection drug use, Persons experiencing homelessness, Work with hepatitis A virus in research laboratory or with non-human primates with hepatitis A virus infection

Hepatitis A

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
AR	AR	AR	R	AR	AR	AR	R	AR	AR	AR	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- At risk for hepatitis A virus infection: 2-dose series HepA 6–18 mo. apart or 3-dose series HepA-HepB (0, 1, 6 mo. [minimum intervals: dose 1 to dose 2: 4 weeks | dose 2 to dose 3 – 6 mo.])
- Travel in countries with high or intermediate endemic hepatitis A (HepA-HepB may be administered on an accelerated schedule of 3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 mo.)
- Booster dose if required, should be given at any time between 6 mo. and 5 years, but preferably between 6 and 12 mo.

Hepatitis B

Vaccine type: Recombinant DNA or plasma-derived inactivated subunit vaccine

Route of administration: Deep Intramuscular injection (IM) in the Deltoid region; avoid buttocks

Dose: 1 ml | 3 doses at 0, 1, 6 months

Storage: Stored between 2°C and 8°C.

Note: Revaccination is recommended every 5 years for high-risk individuals (Immunocompromised, HCPs, CKD on hemodialysis etc.)

Contraindication: History of allergic reaction | allergic reaction Baker's yeast

Guideline recommendations for HepB vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
At risk* (3 doses at 0, 1 & 6 mo.) Revaccination every 5 years	For 19-59 years 3 dose series is recommended; for ≥60 years 3 dose series can be considered	At risk* (3 doses)	-	Adults (3 doses at 0, 1 & 6 mo.)	Preconception or at high risk during pregnancy	At risk* -OR- seeking protection (including post-exposure prophylaxis)	At risk* (2, 3, or 4 doses depending on the type of vaccine)

***At Risk:**

- Chronic liver disease (e.g., persons with hepatitis C, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice the upper limit of normal)
- HIV infection
- Men who have sex with men
- Injection or non-injection drug use

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
AR	R	R	R	R	R	R	R	R	R	R	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- At risk for hepatitis B virus infection: 3-dose series HepB (0, 1, 6 mo. [minimum intervals: dose 1 to dose 2: 4 weeks | dose 2 to dose 3 – 6 mo.])
- Travel in countries with high or intermediate endemic hepatitis A (HepA+HepB may be administered on an accelerated schedule of 3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 mo.)

Human Papilloma Virus

Vaccine type: Recombinant protein capsid liquid vaccine

Vaccines available in India: Bivalent (HPV2) protects against HPV 16 and 18 | Quadrivalent (HPV4) protects against HPV 6,11, 16 and 18 | Nanovalent (HPV9) protects against HPV 6,11

Route of administration: Intramuscular injection (IM)

Dose: 1 ml | 2 or 3 doses at 0, 1 & 6 months

Storage: Should be stored between 2°C and 8°C.

Note: There is currently no recommendation for HPV use in pregnancy. Consider delaying HPV until after pregnancy

Guideline recommendations for HPV vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
Women ≤26 years (3 doses); men ≤21 years (3 doses)	Can be considered	9–14 years: 2 doses 6 mo. apart >15 years, 3 doses at 0, 1, and 6 mo.	-	Females 9–14 years: 2 doses 0, 6 mo.; 15–45 years: 3 doses (0, 1-2 & 6 mo.)	9–26 years; next dose(s), Delay after pregnancy	Females before the onset of sexual activity (3 doses)	Age ≥15 yrs.: 3-doses at 0, 1–2 mo., 6 mo.)

Indian Consensus Recommendations:

Age ≥46 yrs	Age 18 - 45 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
NR	NR	R	R	R	R	R	R	R	R	NR	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Before the first sexual encounter
- HPV vaccination is advised for all people up to age 26: Depending on the age at the first immunization or the condition, a 2- or 3-dose series:
  - Age 15 or older at the time of the initial vaccination: 3-dosage series given over the course of 0, 1, and 6 mo. (minimum intervals: 4 weeks between doses 1 and 2, 12 weeks between doses 2 and 3, and 5 mo. between doses 1 and 3; repeat dose if given too soon).
  - Age 9 to 14 years at the time of the initial vaccination and 1 or 2 doses given no more than 5 mo. apart: 1 extra dosage -Aged 9 to 14 at the time of the first vaccination and 2 doses received at least 5 mo. apart: Complete HPV vaccine series; no further dose is required
- Adults age 27–45 years: Based on shared clinical decision-making, 2- or 3-dose series as above
- Immunocompromising diseases: Such as HIV infection: 3-dose series, even for those who start immunization at age 9 to 14

****All above recommendations are for females <45 years of age and before the first sexual encounter****

Influenza

Vaccine type:
- Inactivated Influenza Vaccine (IIV) includes recombinant trivalent and quadrivalent influenza vaccines. Intra Muscularly route
- Live attenuated influenza vaccine (LAIV). Intranasal Route

Dose: 0.5 ml | 1 dose | Annually

Coadministration:
If 2 or more of the following live virus vaccines are to be given – LAIV, MMR, Var, and|or yellow fever they should be given on the same day. If they are not given on the same day, space them by at least 28 d (30 d for yellow fever). Other inactivated and subunit e.g., PCV13, Shingles (Herpes Zoster) etc. can be added as needed| indicated.

Contraindications for LAIV:
Age ≥50yrs, pregnant women, history of allergic reaction to any excipients of the vaccine or eggs, immunocompromised, received antiviral therapy in ≤48hrs, caregivers of immunocompromised patients requiring isolated environment, patients with asthma, Guillain Barre Syndrome, chronic conditions, etc.

Guidelines Recommending the Influenza Vaccine

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
Yearly (1 dose); Also, during pregnancy (IIV)	Yearly (1 dose)	1 dose Yearly for at risk, including during pregnancy (IIV)	Routinely once a year	Yearly, at risk, including during pregnancy (IIV)	At risk, including during pregnancy (IIV)	Not recommended	Yearly (1 dose); during pregnancy (1 dose)

Indian Consensus Recommendations:

Vaccine	Age ≥50 yrs	Age 18 - 49 years										
		Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
IIV|RIV	R	R	R	R	R	R	R	R	R	R	R	R
LAIV	NR	NR	NR	NR	NR	BR	BR	BR	BR	R	R	R

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Adults who have not received the vaccine should continue to receive it throughout the entire influenza season, especially during times when the virus is active in the neighbourhood e.g. before the monsoon season in South India or before the winter season in Northern India
- All adults, including pregnant women: 1 dose annually
  - All adults: IIV or RIV4 -OR- • For adults up ≤49 yrs age: LAIV

Note: Close contacts and caregivers who care for severely immunocompromised persons (i.e., those who require care in a protective environment) should receive IIV, ccIIV, or RIV rather than LAIV.

At the time of preparing these guidelines trivalent influenza vaccine is not available in India, if and when available trivalent vaccine should be preferred over tetravalent vaccine, as B/Yamagata strains have not been found in India since March 2020.

Although there has been co-circulation of two influenza B virus lineages in past, B/Yamagata-lineage circulation has not been verified since March 2020. The use of quadrivalent live-attenuated vaccines may lead to its detections. All type B viruses identified after March 2020 have been linked to the B/Victoria lineage. A global effort is required to identify the lineage of type B influenza viruses in order to determine whether or not B/Yamagata-lineage viruses are extinct

Japanese Encephalitis

Vaccine type: Live attenuated

Route of administration: subcutaneous injection (SC)

Dose: 0.5 ml | Inactivated vaccine: 2 doses at least 4-week apart

Storage: Should be stored between 2°C and 8°C.

Contraindication: Pregnancy
Note: Live vaccine should not be given during epidemic season

Guideline recommendations for JE vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
-	-	-	-	One dose, Delay pregnancy by 3 mo., Live vaccine should not be given during epidemic season	-	Not recommended	Inactivated vaccine: 2 doses at 4-week gap starting the primary series at≥6 months of age in endemic settings* For immunocompromised individuals, Healthcare workers and Migrants to JE endemic area.

Indian Consensus Recommendations:

Age ≥46 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
BR	BR	BR	BR	BR	BR	BR	BR	BR	AR	R	BR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk |
CKD: Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel |
CV: Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Vaccination is recommended for travelers who plan to stay in endemic areas for a month or longer during the transmission season, even if they stay primarily in urban areas.
- For short-term travelers (less than a month), vaccination should be considered if they plan to spend long periods outdoors in rural or agricultural areas, engage in outdoor activities, or be in areas without adequate protection such as air conditioning, screens, etc. or mosquito nets.
- It should also be considered for travelers visiting areas with ongoing outbreaks or uncertain travel destinations, activities and travel duration.
- However, vaccination is not currently recommended for short-term travelers whose plans relate exclusively to urban areas.
- Can be administered during Kumbh Melas if stay is longer than 1 month.
- Patients with chronic illness or immunodeficiency who live in or move to endemic areas.
- Pregnant women traveling or staying in endemic areas always weigh the benefit-risk ratio before administration

Measles, Mumps and Rubella

Vaccine type: Live-attenuated combined vaccine

Available Combinations: MR= Measles & Rubella | MMR= Measles, Mumps & Rubella | MMRV= Measles, Mumps, Rubella & Varicella

Route of administration: subcutaneous injection (SC)

Dose: 0.5 ml | 2 doses 4 weeks apart

Storage: Should be stored between 2°C and 8°C.

Precautions

- Moderate or severe acute illness with or without fever.
- If blood, plasma, and|or immune globulin were given in past 11 mo., wait for 3 mo. before vaccinating.
- History of thrombocytopenia or thrombocytopenic purpura.

Note: The MMR vaccine is not advised if the patient is pregnant because it is a live attenuated vaccine and could potentially harm the foetus. But in case a pregnant woman receives the MMR, the pregnancy should NOT be terminated on that basis since, there is no proof that the MMR or MMRV vaccines pose a teratogenic risk. Pregnant women may receive the MMR vaccine during measles or rubella outbreaks since the possible advantages of vaccination outweigh the dangers. Since the MMR vaccine is safe during breastfeeding, non-immunized patients should receive it after delivery.

Co-administration: If 2 or more of the following live virus vaccines are to be given – MMR, LAIV, Var, and| or yellow fever – they should be given on the same day. If they are not given on the same day, space them by at least 28 d (30 d for yellow fever). May use as post-exposure prophylaxis if given within 3 d of exposure.

Guideline recommendations for MMR vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
26–55 years (2 doses 28 days apart)	-	Unimmunized (1 dose)	-	2 doses 4-8 weeks apart, if previously immunised 1 dose	MMR for routine preconception| postnatal (pregnancy should be deferred for 3 mo.)	2 doses of Rubella vaccine - HCPs; in the setting of outbreaks; recent exposure to these infections | women in child bearing age; and college students.	19–59 years (1 or 2 doses)

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
NR	NR	NR	NR	R	BR	BR	BR	BR	R	NR	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Is part of routine vaccination
- If unvaccinated: 2 doses at least 4 weeks apart
- If woman of childbearing-age is found to be rubella susceptible and is not pregnant, give 1 dose of MMR; if she is pregnant, the dose should be given postpartum

Meningococcal disease

Vaccine type: Purified bacterial capsular polysaccharide (PBCP) | Conjugate Vaccine

Route of administration: PBCP Subcutaneous | Conjugate vaccine intramuscular injection (IM)

Dose: 0.5 ml | 1 dose

Storage: Should be stored between 2°C and 8°C.

Guideline recommendations for Meningococcal vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
At risk* (Immunocompromised individuals, high-risk travelers and mass gatherings): 1 dose	-	High risk Travelers and epidemic <16 years: 2 doses >16 years: Single dose	-	Adults (1 dose); At risk* (2 doses 4 weeks apart)	-	Not recommended	Adolescent or Travelers to high risk countries: 1 dose At risk* 2 dose series, at least 8 weeks apart, booster every 5 years if risk continues

***At Risk:**
International travelers, Men who have sex with men, People who use or inject drugs (all those who use illegal drugs), People with occupational risk for exposure, People who anticipate close personal contact with an international adoptee, People experiencing homelessness, People with CLD & People with HIV

Indian Consensus Recommendations:

Vaccine	Age ≥50 yrs	Age 18 - 49 years										
		Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
Men ACWY	AR	AR	AR	R	R	AR	AR	AR	AR	AR	R	R

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk |
CKD: Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel |
CV: Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Dose 0.5cc Subcutaneous injection given in 1 dose in most adults
- Anatomical or functional asplenia (including sickle cell disease), HIV infection, persistent complement component deficiency, complement inhibitor (e.g., eculizumab, ravulizumab): 2-dose at least 8 weeks apart and revaccinate every 5 years if risk remains
- Travel to countries with hyperendemic or epidemic meningococcal disease, or mass gatherings, or microbiologists routinely exposed to Neisseria meningitidis: 1 dose and revaccinate every 5 years if risk remains
- First-year college students who live in residential housing (if not previously vaccinated at age 16 years or older) or military camps: 1 dose
- It is recommended only up to the age 55 years

Pneumococcal Disease

Vaccine type:

- **Pneumococcal Polysaccharide Vaccine (PPSV):** It provides protection against 23 serotypes of Streptococcus pneumoniae serotypes viz.; 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, and 33F.
- **Pneumococcal Conjugate Vaccine 13 (PCV13):** PCV13 provides protection against 13 serotypes of S. pneumoniae viz.; 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14,18C, 19A, 19F and 23F.
- **Pneumococcal Conjugate Vaccine 15 (PCV15):** PCV15 provides protection against 15 serotypes of S. pneumoniae viz.; 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 22F, 23F and 33F.
- **Pneumococcal Conjugate Vaccine 20 (PCV20):** PCV20 provides protection against 20 serotypes of S. pneumoniae viz.; s 1, 3, 4, 5, 6A, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 22F, 23F, and 33F.

Note:
According to research by Greenberg et al. among treatment-naive individuals an initial single dose of PCV13 increases the anti-pneumococcal response to subsequent administration of PPSV23 for several common vaccine serotypes. This happens because the conjugated PCV13 vaccination, when given sequentially with PPSV23, recalls and enhances the immune response. On the other hand, following administration of PCV13 for all serotypes results in a reduced response when PPSV23 is first administered before PCV13. The study assisted in offering a plausible justification for the advice to administer PCV13 first and PPSV23 later.[19]

****PCV15 and PCV20 are currently not registered | available in India****

Route of administration: PPSV: Intramuscular or subcutaneous injection | PCV13: intramuscular injection

Dose: PCV13- 0.5ml | PPSV23- 0.5ml | 1 dose of PCV13 followed by PPSV23 1 year later

Storage: Should be stored between 2°C and 8°C.

Co-administration: Adults can receive pneumococcal vaccines (any PCV13 or PPSV23) with herpes zoster vaccines, seasonal influenza vaccines etc. at the same time if required.

Guideline recommendations for Pneumococcal vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	ICS[20]	NHM[13]	CDC[14]
≥19 years (Chronic conditions, Immunocompromised): 1 dose PCV13 followed by PPSV23 8 weeks later. **≥50 years:** 1 dose PCV13 followed by PPSV23 (1 year later)	**≥50 years:** 1 dose PCV13 followed by PPSV23 (1 year later) Booster: if needed ≥5 years after previous PPSV23 dose	≥19 years: Single dose of PCV13 first followed by PPSV23 after 8 weeks. Administer 1 dose of PPSV23 ≥5 years later.	For >50 years PCV13 followed by PPSV23 (one year gap) PCV13 is recommended in all adults > 50 years	Adults (1 dose); At risk* (2 doses 4 weeks apart)	**Adults ≥19 years with chronic conditions and Immunocompromised conditions:** A single dose of PCV13 followed by PPSV23 ≥ 8 weeks later is recommended	Not routinely recommended	Not previously received a dose of PCV13, PCV15, or PCV20 or whose previous vaccination history is unknown: 1 dose PCV15 OR 1 dose PCV20. If PCV15 is used, administer 1 dose PPSV23 at least 1 year after the PCV15 dose (may use minimum interval of 8 weeks for adults with an immunocompromising condition).

Pneumococcal Disease

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
R	-	R	R	R	R	R	R	R	AR	R	R

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Recommended for all, especially those with increased risk irrespective of age (for adults) 1 dose of PCV13 followed by PPSV23 1 year later
- Above 50 years: PCV 13 followed by PPSV23, 1 year later
- At-risk: PCV 13 followed by PPSV23, 1 year later
- High-risk: PCV 13 followed by PPSV23, 8 weeks later
- PCV15 and PCV20 are recommended for adults (Once Approved & Available)
  - Above 50 years: 1 dose of PCV20 only, OR PCV 15 followed by PPSV23 1 year later
  - At-risk: 1 dose of PCV20 only, OR PCV 15 followed by PPSV23 1 year later
  - High-risk: 1 dose of PCV20 only, OR PCV 15 followed by PPSV23 8 weeks later

Poliomyelitis

Vaccine type: Live Attenuated (OPV) | Inactivated Polio Vaccine (IPV)

Route of administration: OPV Oral | IPV intramuscular injection (IM)

Dose: IPV 0.5 ml | **OPV:** 2 drops | 3 doses 0, 1 and 6-12 months

Storage: IPV: Should be stored between 2°C and 8°C **OPV:** Highly heat sensitive and should be kept frozen during storage (after thawing it can be kept between 2 °C and 8 °C for up to 6 mo.)

Contraindication: Pregnancy

Guideline recommendations for Polio vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
IPV: 3 doses (6, 10-14 weeks)->2mo. of age IPV-bOPV schedule-1 or 2 doses of IPV followed by ≥2 doses of bOPV	Recommended	Unimmunized: 3 doses of IPV|OPV spaced by 1 month Immunized: Single dose of IPV	-	2 doses of IPV	-	Not routinely recommended	At risk* (3 doses 0, 1-2 & 6-12 mo.)

***At Risk:**
Travelers who are going to countries where polio is an epidemic or endemic (For additional information, see Polio: For Travelers), Laboratory and healthcare workers who handle specimens that might contain polioviruses, Healthcare workers or other caregivers who have close contact with a person who could be infected with poliovirus, Adults who are identified by public health authorities as being part of a group or population at increased risk of exposure because of an outbreak.

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
NR	NR	NR	NR	NR	NR	NR	NR	NR	BR	R	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk |
CKD: Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel |
CV: Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Previously vaccinated: one lifetime booster dose of IPV
  - Travelers to countries where polio is an epidemic or is endemic.
  - Laboratory and healthcare workers who handle specimens that might contain polioviruses.
  - Healthcare workers or other caregivers who have close contact with a person who could be infected with poliovirus.
- Unvaccinated or incompletely vaccinated adults: 3 doses
  - First dose at any time, followed by second dose at least 1 month later & third dose 6-12 mo. after second dose

Rabies

Categories of contact with suspect rabid animal[21]

Category I - Touching or feeding animals, animal licks on intact skin (no exposure)
Category II - nibbling of uncovered skin, minor scratches or abrasions without bleeding (exposure)
Category III - single or multiple transdermal bites or scratches, contamination of mucous membrane or broken skin with saliva from animal licks, exposures due to direct contact with bats (severe exposure)

Vaccine type: Concentrated, purified cell culture & embryonated egg-based vaccine

Available as: Human diploid cell vaccine | Purified chick embryo cell vaccine | Purified duck embryo cell vaccine | Purified Vero cell rabies vaccine

Route of administration: Intramuscular injection (IM) | Intradermal injection (for resource limited setup e.g., government hospitals receiving several at risk patients in a day)

Dose: 0.5 ml PVRV | 1 ml HDCV or PCEC or PDEC

Storage: Should be stored between 2°C and 8°C.

Contraindication: History of allergic reaction | Egg allergy | pregnancy & lactation | Immunocompromised

Guideline recommendations for Rabies vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
Pre-exposure: 3 doses (0, 7, 28 days for high-risk groups) **Postexposure:** 5 doses (0, 3, 7, 14, and 28 days)	-	**Pre-exposure:** 3 doses (0,7, and 28 days) **Postexposure:** 5 doses (0,3, 7, 14 and 28 days)	Post-exposure (5 doses at day 0,3,7,14 and 28)	Pre-exposure (3 doses- 0,7 & 28 days) Post-exposure (4 doses- 0, 3, 7 & 14|28 days)	-	-	At risk* (1 or 3 doses)

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
R (5Dose)	NR	NR	NR	NR	NR	NR	NR	NR	BR	R	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Pre-exposure high risk
  - Work as a veterinarian or animal handler • Are a veterinary student • Study or explore caves • Study the rabies virus
  - Are traveling to other countries where rabies is common • Joggers, walkers and pet owners should be encouraged
- For pre-exposure 3 doses at 0, 7 & 21 – 28 days
- For post-exposure 4 doses 0, 3, 7 and between 14 – 28 days
- For Elderly post-exposure 5 doses at day 0, 3, 7, 14 and 28

Respiratory Syncytial Virus

USFDA recently approved RSV vaccine on the basis of robust results showing reduced risk for severe RSV-associated lower respiratory tract disease (LRTD).[22,23]

Vaccine type: Recombinant Vaccine with Adjuvant | Recombinant Vaccine without Adjuvant

Route of administration: Intramuscular injection (IM)

Dose: 0.5 ml | 1 dose

Storage: Should be stored between 2°C and 8°C.

Contraindication: History of allergic reaction | Egg allergy | Immunocompromised

Guideline recommendations for Respiratory Syncytial Virus vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
-	-	-	-	-	-	-	Age 60 years or older: Based on shared clinical decision-making, 1 dose - Pregnant at 32 weeks 0 days through 36 weeks and 6 days gestation from September through January in most of the continental United States*: 1 dose

Indian Consensus Recommendations:

Age ≥60 yrs	Age 18 - 59 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
R	R*	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

*If available only non adjuvant vaccine may be considered.

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- For the prevention of lower respiratory tract disease (LRTD) caused by respiratory syncytial virus in individuals 60 years of age and older
- For pregnant person at 32 weeks 0 days through 36 weeks and 6 days gestation at risk of RSV infection - Only Recombinant Vaccine without Adjuvant should be used

****Not yet approved for clinical use in India****

Typhoid

Vaccine Type: Inactivated typhoid vaccine	Vi Polysaccharides Vaccine (ViPS)	Typhoid conjugate vaccine (TCV)	Live typhoid vaccine
Dose: 0.5 ml **Route:** IM **Time:** At least 2 weeks **Booster:** Every 2 years before travel if risk continues	**Dose:** 0.5 ml **Route:** IM **Booster:** Every 3 years	**Dose:** 0.5 ml **Route:** IM **Age:** 2 years and older **Booster:** Maybe given after 3 yrs.	**Route:** orally **Dose:** One capsule is taken every other day, for a total of 4 capsules **Age:** 6 years and older. **Booster:** Every 5 years, if at risk **Contraindications:** Pregnant women, history of allergic reaction to any excipients of the vaccine, immunocompromised

If available Typhoid Conjugated Vaccine should be preferred

Guideline recommendations for Typhoid vaccines in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
1 dose ViPS repeat 2 yearly OR 1 dose TCV up to 45 yrs.	Recommended	Outbreak or high-risk travelers (3 doses, repeat 3-yearly)	-	≤18 years: TCV 1 dose; >18 years: ViPS 3 yearly	-	-	Outbreak or high-risk- ≤18 years: TCV 1 dose travelers (3 doses, repeat 3-yearly)- >18 years

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 59 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
BR	BR	BR	BR	BR	BR	BR	BR	BR	BR	R	R

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Professional food handlers
- Unvaccinated Adults age 18 through 45 yrs may be given TCV in endemic areas
- Travelers at risk of exposure
- During outbreaks
- In pregnant females always weigh the benefit *vs.* risk before giving the vaccine*

***Do not use live vaccine if pregnant.**

Shingles (Herpes Zoster)

Vaccine type: Recombinant zoster vaccine

Route of administration: deltoid or anterolateral thigh area subcutaneous injection

Dose: 2 doses 0.5 ml | 2-6 months apart

Storage: Do not expose to direct sunlight or heat, should be stored between 2°C and 8°C.

Guideline recommendations for Shingles vaccine in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
≥50 years (1 dose – Live or 2 doses Recombinant)	>50 years & above (2 doses)	≥60 years (2 doses 2-6 mo. apart)	-	-	-	-	≥50 years (2 doses 2-6 mo. apart)

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
R	NR	R	R	AR	AR	R	AR	AR	AR	NR	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Routinely recommended for all people above 50 years of age: 2 doses 2-6 months apart (minimum gap 4 weeks)
- Recommended in patients with immune compromising conditions including HIV: 2 doses 2-6 months apart (minimum gap 4 weeks)

Yellow fever

Vaccine type: Live attenuated vaccine

Route of administration: Intramuscular injection (IM)

Dose: 0.5 ml | 1 dose

Storage: Should be stored between 2°C and 8°C.

Contraindication: History of allergic reaction | Egg allergy | pregnancy & lactation | Immunosuppression#

Contraindication:

- Symptomatic HIV infection or AIDS • Malignant neoplasms • Primary immunodeficiencies
- Transplant: solid organ transplant, bone marrow transplant recipients within 2 years of transplant, or persons whose transplants occurred >2 years ago but who are still taking immunosuppressive drugs
- Immunosuppressive or immunomodulatory therapy: For example, corticosteroids, alkylating agents, antimetabolites, TNF-α inhibitors, IL-1 blocking agents, monoclonal antibodies targeting immune cells
- Recent radiation therapy

Guideline recommendations for yellow fever vaccine in adults

API[6]	RSSDI[7]	ISN[8]	GSI[9]	IMA[10]	FOGSI[11,12]	NHM[13]	CDC[14]
1 or 2 doses based on immune status	-	-	-	At risk, booster every 10 years if risk persists	-	Traveler	1 or 2 doses based on immune status

Indian Consensus Recommendations:

Age ≥50 yrs	Age 18 - 49 years										
	Pregnancy	Immuno-compromised	HIV infection	Asplenia, complement deficiencies	CKD| HD	Heart| lung disease	CLD| alcoholism	DM	HCP	Traveller	Mass gathering
NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	NR

R: Recommended | **NR:** Not recommended | **BR:** May be considered after benefit risk evaluation | **AR:** With additional risk | **CKD:** Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Key considerations:

- Not routinely recommended • Travel to certain high-risk countries: 1 dose
- Usually not recommended during pregnancy, and should try to postpone travel; however, if travel cannot be avoided 1 dose can be administered after a thorough benefit *vs.* risk evaluation
- For most people, a single dose of yellow fever vaccine provides long-lasting protection and a booster dose of the vaccine is not
  - vaccinated before nine months of age
  - HIV|AIDS
  - on immunosuppressive therapy
  - Laboratory workers who handle wild-type yellow fever virus

** **Make sure to check the updated list of recognised centres by the government of India for Yellow Fever Vaccine[24]****

Closing the Gap: Bridging the Need for Childhood Vaccines into Adult Healthcare

Rotavirus and Bacille Calmette-Guérin (BCG) vaccines have historically been utilized primarily in pediatric populations for the prevention of rotavirus gastroenteritis and tuberculosis (TB), respectively. However, their use in adults has not been routinely recommended due to various factors including perceived low disease burden, incomplete efficacy data, and potential safety concerns. Nevertheless, emerging evidence suggests potential benefits of these vaccines in adult populations, particularly in specific high-risk groups.[25,26]

Rotavirus Vaccine: Immunocompromised adults, older adults, and individuals with underlying medical conditions may benefit from rotavirus vaccination to prevent severe gastroenteritis and related complications. Further studies are needed to evaluate the efficacy, safety, and cost-effectiveness of rotavirus vaccination in these populations.[26]

BCG Vaccine: High-risk groups such as healthcare workers, individuals with HIV infection, and those living in settings with a high prevalence of tuberculosis may benefit from BCG vaccination to reduce the risk of TB infection and disease progression. Future research should focus on optimizing BCG vaccination strategies in adults, including the development of novel vaccine formulations and delivery methods.[25]

Consensus Recommendations

In the proposed classification framework, vaccine recommendations are stratified into three tiers: Vital, Essential, and Desirable.

Vital recommendations encompass vaccines critical for public health, targeting diseases with high morbidity and mortality rates, emphasizing universal coverage to achieve herd immunity.

Essential recommendations focus on controlling diseases with moderate to high burdens, prioritizing targeted vaccination strategies to reduce disease impact effectively.

Desirable recommendations include vaccines offering additional health benefits, but may require individual risk assessment and careful consideration of factors like cost-effectiveness.

This framework enables nuanced prioritization of vaccines, optimizing resource allocation, and informing public health policies for maximal impact on population health.

Indian Consensus Recommendations

Health Care Personnel

Vaccines	Dose	Frequency	Recommendation Rank
Influenza	1	Annually	Desirable
Typhoid	1	3-7 years in endemic setup	Essential
Tdap	1	Every 10 years	Vital
Hepatitis B	3 doses (0, 1 and 6 mo.)	Every 5 years	Vital
MMR	2 doses to non-immunized (at least 28 days apart)	--	Vital
Covid-19	1	Annually	Essential
Chickenpox	2 doses	--	Vital
Pneumococcal	PCV13 followed by PPSV23 1 year later	PPSV23 booster dose after 5 years	Essential

Patients with Chronic Conditions

Diabetes Mellitus			
Influenza (inactivated)	1	Annually	Desirable
HPV	Female: 2 or 3 doses ≤26 years	--	Vital
	Males: 2 or 4 doses ≤21 years	--	Vital
Tdap | Td	1	Every 10 years	Vital
Hepatitis B	2 doses	--	Vital
Pneumococcal	PCV13 followed by PPSV23 1 year later	1 PPSV23 booster dose after 5 years	Essential
Covid-19	1	Annually	Essential
MMR	1 or 2 doses depending on the condition	--	Vital
Chickenpox	2 doses 4 – 8 weeks apart	--	Vital
Shingles (Herpes Zoster)	2 doses 4-8 weeks apart (patients on chemotherapy)	--	Essential

Patients with Chronic Conditions

Chronic Liver Disease | Alcoholism			
Influenza (inactivated)	1	Annually	Desirable
HPV	Female: 2 or 3 doses ≤26 years	--	Vital
	Males: 2 or 4 doses ≤21 years	--	Vital
Tdap | Td	1	Every 10 years	Vital
Hepatitis B	2 doses	--	
Pneumococcal	1 dose PCV13 followed by 1 dose of PPSV23 1 year later	1 booster dose of PPSV23 after 5 years	Essential
Covid-19	1	Annually	Essential
MMR	1 or 2 doses depending on the condition	--	Vital
Chickenpox	2 doses 4 – 8 weeks apart	--	Vital
Meningococcal	2 doses 4 weeks apart	--	Desirable
Heart or Lung Disease			
Influenza (inactivated)	1	Annually	Desirable
HPV	Female: 2 or 3 doses ≤26 years	--	Vital
	Males: 2 or 4 doses ≤21 years	--	Vital
Tdap | Td	1	Every 10 years	Vital
Pneumococcal	PCV13 followed by PPSV23 1 year later	1 PPSV23 booster dose after 5 years	Essential
Covid-19	1	Annually	Essential
MMR	1 or 2 doses depending on the condition	--	Vital
Chickenpox	1 or 2 doses depending on the indication	--	Vital
Shingles (Herpes Zoster)	2 doses 4-8 weeks apart (patients on chemotherapy)	--	Essential
Meningococcal	2 doses 4 weeks apart (age >50 years)	--	Desirable

Patients with Chronic Conditions

CKD | Haemodialysis			
Influenza (inactivated)	1	Annually	Desirable
Hepatitis B	3 doses	0, 1, and 6 months and a booster after 5 years	Vital
HPV	Female: 2 or 3 doses ≤26 years	--	Vital
	Males: 2 or 4 doses ≤21 years	--	Vital
Tdap | Td	1	Every 10 years	Vital
Pneumococcal	PCV13 followed by PPSV23, 8 weeks later	1 PPSV23 booster dose after 5 years	Essential
Covid-19	1	Annually	Essential
MMR	1 dose	--	Vital
Chickenpox	1 or 2 doses depending on the indication	--	Vital
Shingles (Herpes Zoster)	2 doses 4-8 weeks apart (patients on chemotherapy)	--	Essential
Asplenia | Complement Deficiency | Sickle Cell Disease			
Influenza (inactivated)	1	Annually	Desirable
HPV	Female: 2 or 3 doses ≤26 years	--	Vital
	Males: 2 or 4 doses ≤21 years	--	Vital
Tdap | Td	1	Every 10 years	Vital
Pneumococcal (PCV13 + PPSV23)	1 dose of PCV13 followed by PPSV23 at least 8 weeks later	1 PPSV23 booster dose after 5 years	Essential
Covid-19	1	Annually	Essential
MMR	1 or 2 doses depending on the condition	--	Vital
Chickenpox	1 or 2 doses depending on the indication	--	Vital
Hemophilus influenzae type B	1	--	Essential

Patients with Chronic Conditions

Individuals with Cancer			
Influenza (inactivated)	1	Annually	Desirable
Tdap	1 minimum 3 mo. after chemotherapy	Td every 10 years	Vital
Hib	1 at least 3 mo. after chemotherapy		Essential
Pneumococcal (PCV13 + PPSV23)	PCV13: 1 dose at least 3 mo. after chemotherapy PPSV23: 1 dose at least 8 weeks after PCV13	1 PPSV23 booster dose after 5 years may be considered	Essential
Covid-19	1	Annually	Essential
MMR	2 doses 4 -8 weeks apart	--	Vital
Chickenpox	2 doses 4 -8 weeks apart	--	Vital
Shingles (Herpes Zoster)	2 doses 4-8 weeks apart (patients on chemotherapy)	--	Essential

Immunocompromised Individuals

In general, most inactivated vaccines are safe for immunocompromised individuals, and these individuals should receive all age-appropriate vaccines, including the annual influenza vaccine, pneumococcal vaccines (PCV13 and PPSV23), hepatitis B vaccine, and the meningococcal conjugate vaccine. However, live vaccines such as MMR, varicella, and the oral polio vaccine are usually contraindicated in this population due to the risk of vaccine-associated infections

Recipients of Hematopoietic Stem Cell Transplant (HSCT)

Several factors, including the donor's immune status, type of transplant, time since transplant, ongoing immunosuppressive treatment, and the presence of graft-versus-host disease, can influence the immunization process for individuals. It is advisable to undergo a full reimmunization process starting with inactivated vaccines at least one year after bone marrow transplantation.

Recipients of HSCT

Vaccines	Dose	Schedule	Recommendation Rank
TD|TdaP	3	6 – 12 mo. after transplant	Vital
Hepatitis B	3	6 mo. after transplant	Essential
Hib	2	6 – 12 mo. after transplant followed by booster dose 2 – 6 mo. later	Essential
HPV	3	6 mo. after transplant	Vital
Influenza	1	4 – 6 mo. after transplant	Desirable
IPV	3	6 – 12 mo. after transplant	Desirable
Meningococcal conjugate	2	6 mo. after transplant	Essential
MMR	2	4 – 8 weeks apart	Vital
Pneumococcal (PCV13)	3	3 – 6 mo. after transplant, at least 4 weeks apart	Essential
Pneumococcal (PPSV23)	1	At least 8 weeks after the last dose of PCV13 and 12 months after the HSCT	Essential
Chickenpox	2	4 – 8 weeks apart	Vital
Shingles (Herpes Zoster)	2	3–12 months after transplantation 2 – 6 mo. apart	Desirable

Recipients of Solid Organ Transplant

An accelerated immunization schedule is recommended in donor and recipient. Below is the recommended schedule for patients and donors undergoing solid organ transplant:[27]

Vaccines	Recipient & Donor		Comments	Recommendation Rank
Inactivated vaccines				
Pneumococcal (PCV13, PPSV23)	PCV13 followed by PPSV23, 8 weeks later		Booster dose with PPSV23 after 5 years	Vital
Meningococcal	2 doses, 8 weeks apart in those at risk		Should be given before splenectomy, before eculizumab	Essential
Hib	Complete schedule	As in normal individuals		Essential
Influenza	1 dose annually		1 – 3 mo. after transplant, later results in better protection	Desirable
Hepatitis A	2 doses, 6 mo. apart		If travelling to South Asia	Desirable
Hepatitis B	3-4 doses before transplant		Booster dose if antibody titre <10mU|ml | Serology testing 4-weeks after complete dose	Desirable

Vaccines	Recipient & Donor		Comments	Recommendation Rank
Inactivated vaccines				
IPV	Complete Schedule		If not vaccinated previously	Desirable
Tdap	1 dose – 2 weeks before Transplant		Booster every 10 years	Vital
HPV	3 doses at 0, 2, 6 mo.		For age 11-26 years, if schedule not completed earlier	Vital
Shingles (Herpes Zoster)	2 doses	Not recommended	Preferred pre-transplant, if not possible give 6-12 mo. after transplant	Essential
Typhoid	Polysaccharide - 1 dose (Booster after 3 years)		Required: Before travel	Desirable
	Conjugated - 1 dose (No booster required)			
COVID-19	2 doses 4 weeks apart (or as per individual vaccine recommendation)		Booster as required	Essential
Live Vaccines				
MMR	Should be complete before transplant		Contraindicated after transplant	Vital
Varicella	Pretransplant 2 doses 1 month apart		Contraindicated after transplant	Vital
Yellow Fever	Contraindicated		Avoid travelling to Africa and South America if not vaccinated; if travel is necessary, must travel with yellow card with stamp and reason not vaccinated	

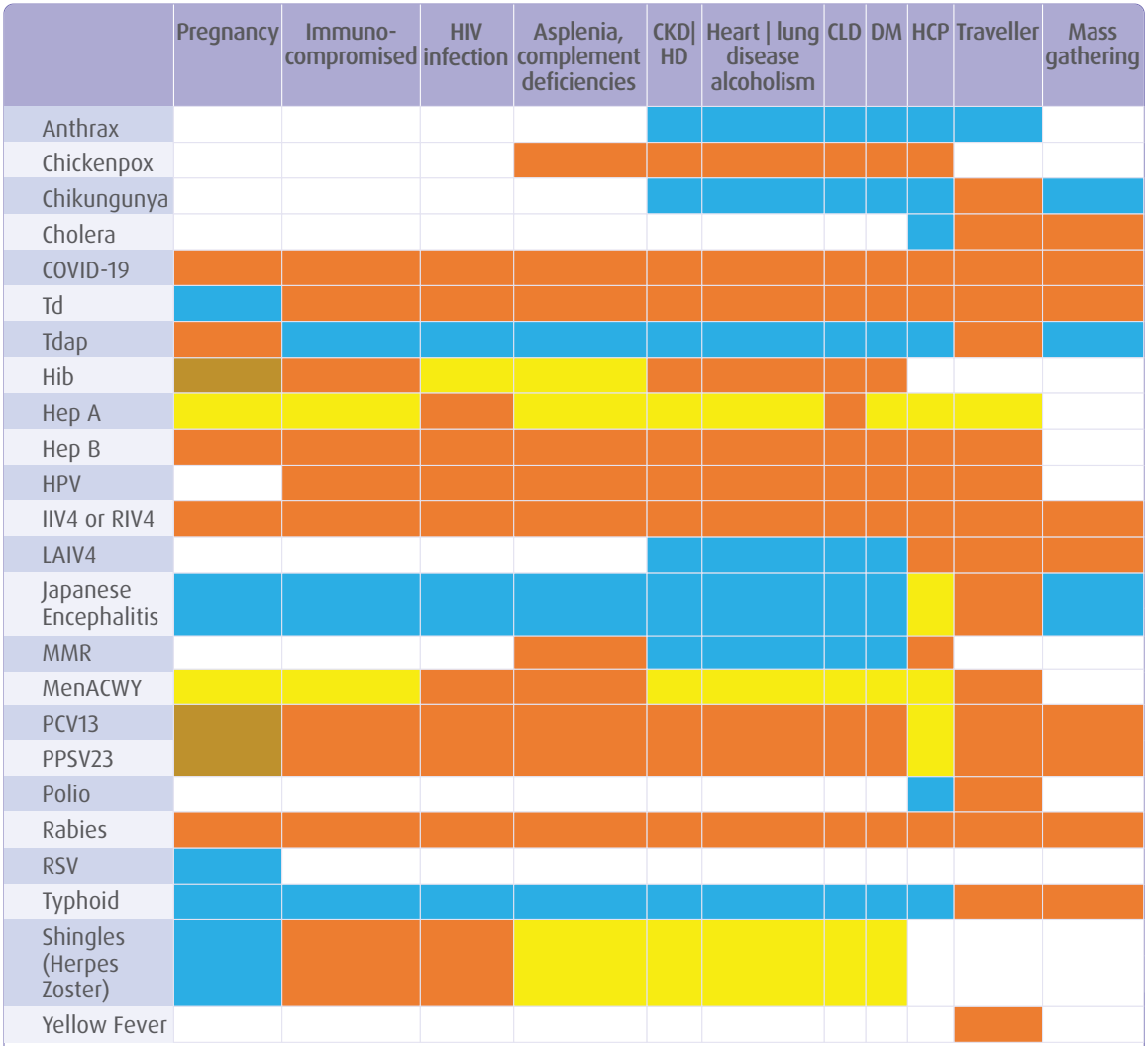
HIV Infection or Other Immunocompromising Conditions

HIV positive and other immunocompromised states			
Vaccines	**Dose**	**Booster**	**Recommendation Rank**
Influenza (inactivated)	1	Annually	Desirable
Typhoid	1	3-7 years in endemic setup	Desirable
Tdap|Td	1	Td every 10 years	Vital
Hepatitis B	3 doses (0, 1 and 6 mo.)	--	Essential
Pneumococcal	PCV13 followed by PPSV23 8 weeks later	Booster doses of PPSV23 after 5 years and at age 65 years	Vital
Covid-19	1	Annually	Essential
MMR	2 doses 4 weeks apart	CD4 count ≥200 cells|mm^3 for at least 6 mo. Contraindicated for CD4 count <200 cells|mm^3	Vital
Varicella	2 doses 3 mo. apart	CD4 percentages ≥15% and CD4 count ≥200 cells|mm^3	Vital
HPV-9	3 doses	For individuals ≤26 years of age ay 0, 6 and 12 mo.	Vital
Shingles (Herpes Zoster)	2	2 – 6 mo. apart (min gap 4 week)	Essential

During Pregnancy

Vaccines	Pregnant females	Dose	Recommendation Rank
Influenza (Flu) (IIV):	Recommended	1	Desirable
Tdap	At least one dose of Tdap vaccine is recommended during each pregnancy, preferably between 27 and 36 weeks of gestation	1	Vital
COVID-19 Vaccine	Recommended during pandemic or local epidemics	1	Essential
Hepatitis B	Recommended.	3	Essential

Indian Consensus Recommendation for Risk Conditions



CKD: Chronic kidney disease | **HD:** Haemodialysis | **DM:** Diabetes mellitus | **CLD:** Chronic liver disease | **HCP:** Health care personnel | **CV:** Cardiovascular | **ICU:** Intensive care unit

Indian Consensus Recommendation Based on Age

Age	18 – 26 years	27 – 49 years	50 – 64 years	≥65 years
Anthrax				
Chickenpox				
Chikungunya				
Cholera	At risk			
COVID-19	During pandemic or epidemic			
Hib				
Hep A				
Hep B				
HPV	3 doses	2 doses		
IIV4 or RIV4				
LAIV4				
Japanese Encephalitis				
MMR				
MenACWY				
PCV13 PPSV23				
Polio				
Rabies (post-exposure)	4 doses			5 doses
RSV				Above 60 years
TdaP|Td	1st dose of Tdap followed by booster dose of Td|TdaP every 10 years			
Typhoid	At risk			
Shingles (Herpes Zoster)				
Yellow Fever	If risk of exposure or traveling to an endemic country			

Recommended | Not Recommended | Benefit Risk Ratio | Additional Risk Factor | No Guidance

Recommendation for traveling to India

List of recommended vaccines

Routine: MMR, DTaP, varicella (chickenpox), polio, Covid-19, pneumococcal and influenza vaccine status is up-to-date

Hepatitis A: Risk of contracting hepatitis A through contaminated food or water is high

Typhoid: Recommended for Travelers at risk of exposure

Hepatitis B (if needed): If one might have intimate contact with locals or require medical treatment during your stay

Japanese Encephalitis: If one plans to spend an extended period (>1 month) in rural or agricultural areas, especially during the monsoon season

Rabies: Plan or risk of animal exposure, pre-exposure vaccine may be given (3 doses at 0,7 and 28 days)

Cholera: Plan to visit or stay in outbreak-prone areas

Polio: OPV is mandatory for people coming from these countries Afghanistan, Ethiopia, Israel, Kenya, Nigeria, Pakistan and Somalia at least 6 weeks before planned travel to India and is valid for 1 year

Meningococcal Meningitis: 1 dose is recommended 10-14 days before planned travel date

Yellow Fever: It is mandatory for Travelers coming from Africa and South America. 1 dose in a life time is sufficient

Students travelling from India to international destinations

It is recommended to visit individual country's immunization recommendations well in advance before travel to check for latest recommendations. However, some of the common vaccines recommended for international Travelers include:

Routine Vaccines

Diphtheria, tetanus and pertussis	Meningococcal
Hepatitis B	Pneumococcal
Haemophilus influenzae type B	Polio
Human papillomavirus	Rotavirus
Influenza (seasonal)	Tuberculosis
Measles, mumps and rubella (MMR)	Varicella

MMR: Either evidence of protective antibodies or MMR vaccination is mandatory for adolescents seeking college admissions in Europe and US
Hepatitis A: Recommended for Travelers to areas with poor sanitation and limited access to clean water and food safety
Typhoid: Recommended for Travelers visiting regions with an increased risk of typhoid fever
Yellow Fever: Mandatory for Travelers visiting certain countries with yellow fever transmission and may require an International Certificate of Vaccination or Prophylaxis (ICVP) for entry
Rabies: Considered for Travelers with potential exposure to animals or remote areas with limited access to medical care (Pre-exposure 3 dose schedule should be followed at 0, 7 and 28 days)
Japanese Encephalitis: Recommended for Travelers to areas with Japanese Encephalitis transmission, especially during the transmission season
Meningococcal Meningitis: Recommended for Travelers visiting regions with a risk of meningococcal disease, especially during mass gatherings or outbreaks.
Polio (Inactivated Polio Vaccine - IPV): Recommended for Travelers to areas with ongoing polio transmission
Cholera: The oral cholera vaccine may be considered for Travelers visiting areas with active cholera outbreaks
COVID-19 Vaccine: Given the ongoing global pandemic, COVID-19 vaccination is essential for international travel and may be required by most countries

Recommendation for Pilgrims

Mandatory vaccines for mass gathering within India (e.g., Kumbh mela)	
For everyone	*Prolonged Stay*
Typhoid	Hepatitis B
Hepatitis A	Japanese Encephalitis
Influenza	Pneumococcal
Mandatory vaccines for mass gathering outside India (e.g., Hajj, Umrah etc.)	
For everyone	*Prolonged Stay*
Quadrivalent Meningococcal Vaccine	Pneumococcal
Influenza	
Polio	

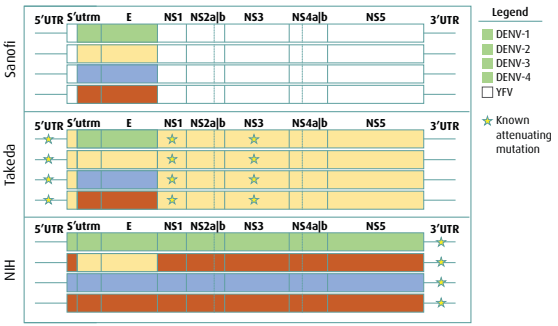
Upcoming Vaccines

Dengue

Several countries have licensed the first live-attenuated chimeric yellow-fever| tetravalent dengue vaccine (CYD-TDV), known as Dengvaxia. However, the vaccine has shown low efficacy in children and individuals who have not been previously exposed to dengue, and it has even increased the risk of severe dengue in such individuals. To address these issues, a heterologous prime-boost regimen using sequential immunization with DENVax and Dengvaxia has been proposed. This regimen targets all four serotypes of dengue and eliminates the adverse effect of antibody-dependent enhancement (ADE). Additionally, combining inactivated vaccines with alum and live attenuated vaccines in a heterologous prime-boost regimen may enhance the immune response. However, the lack of an ideal animal model for dengue poses challenges in vaccine development, and the macaque model is being considered for studying immunological responses similar to those observed in humans.[28]

In an interview with 'The Hindu', Dr. Nivedita Gupta, the Head of Virology at the Indian Council of Medical Research (ICMR), provided details about two potential vaccines. The vaccine developed by the Serum Institute of India has initiated phase 1|2 studies in the pediatric population. On the other hand, Panacea's vaccine is planning to conduct a phase III randomized, double-blind, placebo-controlled trial involving 10,335 healthy adults aged 18-80 years at 20 ICMR-funded sites. The phase III protocol has received approval from the Drugs Controller General of India in January 2023, and the company is working towards scaling up vaccine production. The trials are expected to commence in August-September of this year. The ICMR has outlined the desirable characteristics for a dengue vaccine, which include a satisfactory short- and long-term safety profile without antibody-dependent enhancement. The vaccine should provide protection against all four serotypes of dengue, reduce the risk of severe diseases and deaths, induce a sustained immune response, and be effective regardless of the individual's previous serostatus or age.[29]

Live attenuated dengue vaccine constructs[28]



Human Immunodeficiency Virus (HIV)

HIV, a retrovirus with an enveloped structure and a single-stranded RNA genome, leads to the development of acquired immunodeficiency syndrome (AIDS) in its late stage. Primary infection with HIV can present symptoms within two to four weeks of the virus entering the body. Subsequently, a prolonged chronic infection ensues, which can persist for many years. AIDS is primarily characterized by the occurrence of opportunistic infections and tumours, which often result in fatality if left untreated. Several Vaccines have been developed and are undervaluation for efficacy and safety viz.; The eOD-GT8 60mer (mRNA-1644) vaccine, developed by IAVI and Scripps Research in collaboration with Moderna, safely induced

targeted immune responses in 97% of recipients in the Phase I clinical trial (IAVI G001).[30,31] The germline-targeting vaccine design priming strategy, demonstrated in the Phase 1 clinical study IAVI G002, supports the development of boosting regimens to generate VRC01-class bnAb responses against HIV. Another Phase 1 clinical study (IAVI G003) is currently ongoing to investigate the eOD-GT8 60mer mRNA Vaccine in African populations. Moderna Inc. is advancing three Phase I clinical trials for HIV vaccines, including mRNA-1644|IAVI G002, mRNA-1644|IAVI G003, and mRNA-1574|NIAID.[32] Vir Biotechnology, Inc. is developing VIR-1388,[33] a T cell vaccine based on the human cytomegalovirus vector platform, for HIV prevention. HOOKIPA Pharma's preclinical studies demonstrated that their 2-vector therapy for Arenaviral therapeutic vaccines induces a stronger immune response and reduces viral load.[34] AELIX Therapeutics S.L. reported positive results from the phase 1 clinical study of their therapeutic HIV vaccine, HIVACAT T-cell immunogen (HT,I), published in Nature Medicine.[35] CD40. HIVRI. Env, developed by the Vaccine Research Institute, is undergoing a phase 1 clinical study.[36] Uvax Bio, LLC's HIV-1 vaccine candidate will enter a Phase 1 clinical trial sponsored by the U.S. NIH in early 2024. Additionally, research has shown the potential of a single-component, self-assembling protein nanoparticle (1c-SApNP) displaying native-like Env trimers as vaccine candidates.[37]

Malaria

In a recent update, The WHO released the recommendations for RTS, S|AS01 vaccine,[38] is the pioneering malaria vaccine resulting from a long-standing collaboration between public and private entities that dates back to 1983. While other candidates for P. falciparum malaria vaccines are currently in clinical evaluation, RTS, S|AS01 stands as the first vaccine to complete Phase 3 trials and be administered to children through routine immunization programs in phased pilot introductions.[39] It received positive scientific opinion from the European Medicines Agency in 2015 and national regulatory authorization for use in Ghana, Kenya, and Malawi as part of the Malaria Vaccine Implementation Programme in 2019. Another trial utilized the high initial efficacy of RTS, S|AS01 by administering three primary doses at monthly intervals followed by annual single doses during the intense high transmission season. This combined approach of the vaccine and seasonal malaria chemoprevention was superior to either intervention alone. Promising candidates approaching late-stage clinical evaluation include R21|MatrixM targeting PfCSP protein and PfSPZ, an attenuated whole sporozoite vaccine.[40] Various technologies such as DNA and mRNA-based vaccines, adjuvants, virus-like particles, and vesicle-based platforms are being explored for the development of malaria vaccines.[40-42] WHO has issued guidelines and preferred product characteristics to support the ongoing research and advancement of recombinant malaria vaccines, with updates underway to incorporate recent progress in the field.

Tuberculosis

In a phase 2b placebo-controlled study published in NEJM 2019, M72|AS01E vaccine was evaluated in patients with latent M. tuberculosis infection. Most participants had previously received the BCG vaccine. M72|AS01E provided 54.0% protection for M. tuberculosis–infected adults against active pulmonary tuberculosis disease, without evident safety concerns.[43] In an announcement

made on Wednesday 28th June 2023, the 26,000-person, Phase 3 study, set to begin next year, will test the vaccine's efficacy and safety. If proven effective, would be the first new tuberculosis vaccine in over a century.[44]

Leprosy

National Leprosy Eradication Program (NLEP) initiated the implementation of the Mycobacterium Indicus Prani (MiP) vaccine project in India in 2016. Extensive trials, both in hospitals and among the general population, have demonstrated the dual benefits of the MiP vaccine, showcasing its immunotherapeutic and immune-prophylactic effects in individuals with multibacillary leprosy and their contacts. This vaccine has proven effective in diminishing the bacillary load, improving histopathological lesions, achieving complete granuloma clearance, reducing reactions and neuritis, and shortening the duration of multidrug therapy (MDT) for leprosy patients. In a new project conducted under the collaboration of Indian Council of Medical Research (ICMR) and NLEP, the MiP vaccine is administered to the index leprosy patient in addition to the standard MDT. Concurrently, family members and contacts of the index case receive the MiP vaccine twice, spaced six mo. apart, with the objective of fortifying their immunity to prevent leprosy upon exposure to Mycobacterium leprae from an infected patient. The immunization of the index case aims to expedite the clearance of bacteria and clinical lesions, while MiP vaccination in contacts is designed to enhance their immunity, providing protection against the development of clinical disease upon exposure to M. leprae from infected individuals.[45]

Other vaccines being developed

Zika Virus Vaccine: Various candidates were under development by different pharmaceutical companies, including Takeda, Moderna, and Walter Reed Army Institute of Research (WRAIR). These candidates were in various stages of preclinical and clinical development.[46]

Norovirus Vaccine: Vaxart and Takeda were among the companies working on oral norovirus vaccine candidates. These candidates were in different phases of clinical trials.[47]

Group B Streptococcus (GBS) Vaccine: Several companies, including Pfizer, GlaxoSmithKline (GSK), and Sanofi Pasteur, were involved in the development of GBS vaccine candidates. These candidates were in the preclinical and early clinical stages.[48]

Staphylococcus aureus Vaccine: Several private sector players are working on Staphylococcus aureus vaccine candidates targeting hospital-acquired infections. These candidates are in different stages of clinical trials.[49]

Bacterial lysates: Bacterial lysates are immunostimulants derived from bacterial cells that have been ruptured or lysed. These lysates contain a variety of bacterial components such as proteins, nucleic acids, and cell wall fragments, which can activate the immune system and stimulate a protective response against bacterial infections. Bacterial lysates have been used as immunotherapeutic agents in some medical settings, especially in respiratory conditions like recurrent respiratory infections and chronic obstructive pulmonary disease (COPD). While bacterial lysates have shown potential in boosting immune responses, their clinical efficacy is still a subject of ongoing research and debate. The available evidence is not yet sufficient to recommend bacterial lysates as a standard treatment for all individuals or for the prevention of bacterial infections.[50]

Personalized Vaccines for Cancer

Researchers led by Dr. Vinod Balachandran at Memorial Sloan Kettering Cancer Center have developed a personalized mRNA cancer treatment vaccine for pancreatic ductal adenocarcinoma (PDAC), the most common and deadly form of pancreatic cancer. In a small clinical trial, tumour samples from 19 patients were sequenced to identify neoantigens, and personalized mRNA vaccines were created based on these findings. Participants received immune checkpoint inhibitor atezolizumab before vaccination and then received nine doses of the personalized vaccine over several mo. Results showed that half of the patients had a strong immune response, with T cells recognizing the neoantigens. Those with a strong response remained cancer-free after a year and a half, while those with a weaker response experienced recurrence within an average of just over a year. The study demonstrates the potential of personalized vaccines to activate the immune system against pancreatic cancer and paves the way for further research and larger clinical trials.

Conclusion

In conclusion, it is fair to say that adult vaccination plays a vital role in safeguarding individual and public health. The consensus statement emphasizes the importance of immunization in adults, highlighting the numerous benefits it offers. By ensuring high vaccination rates among adults, we can effectively prevent and control infectious diseases, protect vulnerable populations, and reduce the burden of illness within communities.

Healthcare professionals have a crucial role in promoting adult vaccination and leading by example. By prioritizing their own immunizations, they not only protect themselves but also serve as advocates for patients and the broader population. Compliance with occupational health requirements and adherence to recommended vaccination schedules contribute to a safer healthcare environment and reduce the risk of workplace outbreaks.

Further, adult vaccination goes beyond individual protection, fostering herd immunity and preventing the transmission of diseases to those who are more susceptible, such as the elderly, infants, and individuals with compromised immune systems. This collective effort is essential for minimizing the impact of vaccine-preventable diseases on public health.

In light of these considerations, it is crucial for healthcare providers, policymakers, and the public to recognize the significance of adult vaccination and work together to overcome barriers to immunization. Efforts should be made to increase awareness, improve access to vaccines, and address vaccine hesitancy through education and evidence-based communication.

By embracing the consensus statement on adult vaccines and implementing its recommendations, we can achieve a healthier and more resilient society, where preventable diseases are kept at bay, and individuals can enjoy a higher quality of life. Investing in adult vaccination is an investment in the well-being and future of our communities.

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Appendix

Screening Checklist for Contraindications to Vaccines for Adults

Patient Information: The following questions will help us determine which vaccines you may be given today. If you answer "yes" to any question, it does not necessarily mean you should not be vaccinated. It just means we need to ask you more questions. If a question is not clear, please ask your healthcare provider to explain it.

Question	Yes	No	Don't know
1. Are you sick today?			
2. Do you have allergies to medications, food, a vaccine ingredient, or latex?			
3. Have you ever had a serious reaction after receiving a vaccine?			
4. Do you have a long-term health problem with heart, lung, kidney, or metabolic disease (e.g., diabetes), asthma, a blood clotting disorder, no spleen, complement component deficiency, a cochlear implant, or a spinal fluid leak? Are you on long-term aspirin therapy?			
5. Do you have cancer, leukaemia, HIV|AIDS, or any other immune system problem?			
6. Do you have a parent, brother, or sister with an immune system problem?			
7. In the past 3 mo., have you taken medicines that affect your immune system, such as prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn's disease, or psoriasis; or have you had radiation treatments or anticoagulants (blood thinning medications)?			
8. Have you had a seizure or a brain or other nervous system problem?			
9. During the past year, have you received a transfusion of blood or blood products, or been given immune (gamma) globulin or an antiviral drug?			
10. Are you pregnant or is there a chance you could become pregnant during the next month?			
11. Have you received any vaccinations in the past 1 month (4 weeks)?			
12. Are you travelling internationally in foreseeable future?			

Information for Healthcare Professionals about the Screening Checklist for Contraindications to Vaccines for Adults

Are you interested in knowing why we included a certain question on the screening checklist? If so, read the information below. If you want to find out even more, refer to individual vaccine section.

Are you sick today? [all vaccines]

There is no evidence that acute illness reduces vaccine efficacy or increases vaccine adverse events. However, as a precaution with moderate or severe acute illness, all vaccines should be delayed until the illness has improved. Mild illnesses (e.g., upper respiratory infections, diarrhoea) are NOT contraindications to vaccination. Do not withhold vaccination if a person is taking antibiotics.

Do you have allergies to medications, food, a vaccine ingredient, or latex? [all vaccines]

An anaphylactic reaction to latex is a contraindication to vaccines that contain latex as a component or as part of the packaging (e.g., vial stoppers, prefilled syringe plungers, prefilled syringe caps). If a person has anaphylaxis after eating gelatin, do not administer vaccines containing gelatin. A local reaction to a prior vaccine dose or vaccine component, including latex, is not a contraindication to a subsequent dose or vaccine containing that component. For information on vaccines supplied in vials or syringes containing latex, see www.cdc.gov/vaccinespubs/pinkbook/downloads/appendices/B/latex-table.pdf; for an extensive list of vaccine components, see www.cdc.gov/vaccines/pubs/pinkbook/downloads/ appendices/B/excipient-table-2.pdf. People with egg allergy of any severity can receive any IIV, RIV, or LAIV that is otherwise appropriate for the patient's age and health status; ccIIV and RIV do not contain egg antigen. When administering an influenza vaccine other than ccIIV or RIV to a person with a history of severe allergic reaction to egg, or who required emergency medical intervention (e.g., epinephrine), vaccination should occur in a clinic, health department, or physician office; vaccine administration should be supervised by a healthcare provider who is able to recognize and manage severe allergic conditions.

Have you ever had a serious reaction after receiving a vaccine? [all vaccines]

History of anaphylactic reaction (see question 2) to a previous dose of vaccine or vaccine component is a contraindication for subsequent doses. Under normal circumstances, vaccines are deferred when a precaution is present. However, situations may arise when the benefit outweighs the risk (e.g., during a community pertussis outbreak).

Do you have a long-term health problem with heart, lung, kidney, or metabolic disease (e.g., diabetes), asthma, a blood clotting disorder, no spleen, complement component deficiency, a cochlear implant, or a spinal fluid leak?

Are you on long term aspirin therapy? [MMR, VAR, LAIV] A history of thrombocytopenia or thrombocytopenic purpura is a precaution to MMR vaccine. LAIV is not recommended for people with anatomic or functional asplenia, complement component deficiency, a cochlear implant, or CSF leak. Underlying health conditions of the heart, lung, kidney, or metabolic disease (e.g., diabetes) and asthma are considered precautions for the use of LAIV. Aspirin use is a precaution to VAR.

Do you have cancer, leukemia, HIV|AIDS, or any other immune system problem? [LAIV, MMR, VAR]

Live virus vaccines (e.g., LAIV, MMR, VAR) are

usually contraindicated in immunocompromised people. However, there are exceptions. For example, MMR vaccine is recommended and VAR vaccine may be considered for adults with CD4+ T-lymphocyte counts of greater than or equal to 200 cells|µL. Immuno-suppressed people should not receive LAIV.

Do you have a parent, brother, or sister with an immune system problem? [MMR, VAR]

MMR or VAR vaccines should not be administered to persons who have a family history of congenital or hereditary immunodeficiency in first-degree relatives (i.e., parents and siblings), unless the immune competence of the potential vaccine recipient has been substantiated clinically or verified by a laboratory.

In the past 3 mo., have you taken medicines that affect your immune system, such as cortisone, prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn's disease, or psoriasis; or have you had radiation treatments? [LAIV, MMR, VAR]

Live virus vaccines (e.g., LAIV, MMR, VAR) should be postponed until after chemotherapy or long-term high-dose steroid therapy has ended. For details and length of time to postpone, see references in Notes above. Some immune mediator and immune modulator drugs (especially the anti-tumor necrosis factor agents adalimumab, infliximab, etanercept, golimumab, and certolizumab pegol) may be immunosuppressive. A comprehensive list of immunosuppressive immune modulators is available in CDC Health Information for International Travel (the "Yellow Book") available at wwwnc.cdc.gov/travel/yellowbook/2020/travelerswith-additional-considerations/immunocompromised-travelers. The use of live virus vaccines should be avoided in persons taking these drugs. To find specific vaccination schedules for stem cell transplant (bone marrow transplant) patients.

Have you had a seizure or a brain or other nervous system problem? [influenza, Td|Tdap]

Tdap is contraindicated in people who have a history of encephalopathy within 7 days following DTP|DTaP. An unstable progressive neurologic problem is a precaution to the use of Tdap. For people with stable neurologic disorders (including seizures) unrelated to vaccination, or for people with a family history of seizure, vaccinate as usual. A history of Guillain-Barré syndrome (GBS) is a consideration with the following: 1) Td|Tdap: if GBS has occurred within 6 weeks of a tetanus toxoid vaccine and decision is made to continue vaccination, give Tdap instead of Td if no history of prior Tdap; 2) Influenza vaccine (IIV|LAIV): if GBS has occurred within 6 weeks of a prior influenza vaccine, vaccination should generally be avoided unless the benefits outweigh the risks (for those at higher risk for complications from influenza).

During the past year, have you received a transfusion of blood or blood products, or been given immune (gamma) globulin or an antiviral drug? [MMR, VAR]

Certain live virus vaccines (e.g., MMR, LAIV, VAR) may need to be deferred, depending on several variables. Consult General Best Practice Guidelines for Immunization (referenced in Notes above) for current information on intervals between antiviral drugs, immune globulin or blood product administration and live virus vaccines.

Are you pregnant or is there a chance you could become pregnant during the next month? [HPV, HepB, IPV, LAIV, MenB, MMR, VAR]

Live virus vaccines (e.g., MMR, VAR, LAIV) are contraindicated one month before and during pregnancy because of the theoretical risk of virus transmission to the fetus. Sexually active women in their childbearing years who receive live virus vaccines should be instructed to avoid pregnancy for one month following receipt of the vaccine. IPV and MenB vaccination should be limited to those with an elevated risk of exposure during pregnancy. IIV and Tdap are both recommended during pregnancy. Two brands of hepatitis B vaccine (Heplisav-B and PreHevbrio) are not recommended during pregnancy due to a lack of safety data in this population; pregnant people needing hepatitis B vaccination should receive Engerix-B or Recombivax-HB, which are known to be safe and effective during pregnancy. HPV vaccine is not recommended during pregnancy.

Have you received any vaccinations in the past 4 weeks? [LAIV, MMR, VAR, yellow fever]

People who were given either LAIV or an injectable live virus vaccine (e.g., MMR, VAR, yellow fever) should wait 28 days before receiving another live virus vaccination (30 days for yellow fever). Inactivated vaccines may be given at any spacing interval if they are not administered simultaneously.

Abbreviations:
LAIV: Live attenuated influenza vaccine | **HPV:** Human papillomavirus vaccine | **IIV:** Inactivated influenza vaccine | **ccIIV:** Cell culture inactivated influenza vaccine | **IPV:** Inactivated poliovirus vaccine | **MMR:** Measles, mumps, and rubella vaccine | **RIV:** Recombinant influenza vaccine | **Td|Tdap:** Tetanus, diphtheria, (acellular pertussis) vaccine | **VAR:** Varicella vaccine | **MenB:** meningitis B | **HIV:** Human immunodeficiency virus vaccine

Storage best practices for refrigerated vaccines-celsius (C)

1 Unpack vaccines immediately

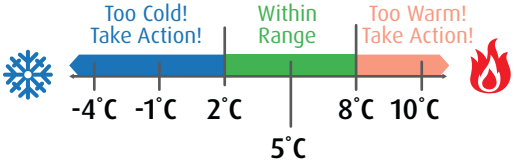
- Place the vaccines in trays or containers for proper airflow.
- Put vaccines that are first to expire in front.
- Keep vaccines in original boxes with lids closed to prevent exposure to light.
- Separate and label vaccines by type and public (VFC) or private.

2 Store vaccines at ideal temperature: 5˚C

Never freeze refrigerated vaccines!

Exception: MMR can be stored in a refrigerator or freezer

Refrigerated vaccines



Report out-of-range temperatures immediately!

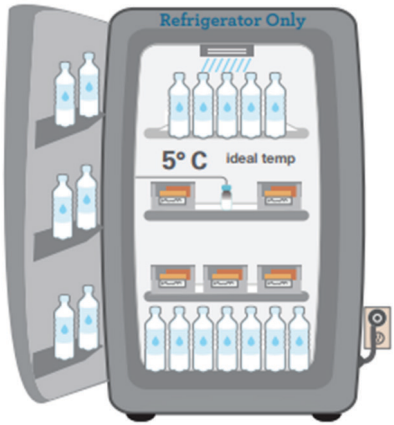
3 Use vaccine storage best practices

DO

- Do make sure the refrigerator door is properly closed!
- Do replace crisper bins with water bottles to help maintain consistent temperature.
- Do lable water bottles "Do Not Drink."
- Do leave 2 to 3 inches between vaccine containers and refrigerator walls.
- Do post "Do Not Unplug" signs on refrigerator and near electrical outlet.

DON'T

- Don't use dormitory-style refrigerator.
- Don't use top shelf for vaccine storage.
- Don't put food or beverages in this refrigerator.
- Don't put vaccines on door shelves or on the floor of refrigerator.



Vaccines	Exposure to heat | light	Exposure to cold
Heat and light sensitive vaccines		
OPV	Sensitive to heat	Not damaged by freezing
Measles | MR	Sensitive to heat and light	Not damaged by freezing
BCG, RVV and JE	Relatively heat stable but sensitive to light	Not damaged by freezing
Freeze sensitive vaccines		
Hep B | Penta | PCV	Relatively heat stable	Freezes at -0.5˚C (should not be frozen)
IPV, DPT, and TT	Relatively heat stable	Freezes at -3˚C (should not be frozen)
At the PHC level, all vaccines are kept in the ILR for a period of one month at temperature of +2˚C to +8˚C		

Vaccines sensitive to heat

BCG (after reconstitution)
OPV
IPV
MR
Rotavirus
JE
DPT
BCG (before reconstitution)
TT

Most sensitive

Least sensitive

Vaccine sensitive to freezing

Hep B
PCV
Penta
IPV
DPT
TT

Most sensitive

Least sensitive

PCV: Pneumococcal conjugate vaccine. **RVV:** Rotavirus vaccine. **JE:** Japanese encephalitis. **Penta:** DTwP+HiB+HepB. **DTwp:** Diphtheria, tetanus, whole cell pertussis; **HIB:** Haemophilus conjugate type B. **HepB:** Hepatitis B.

Frequently Asked Questions on Adult Immunization[51,52]

1. Why are vaccinations important for adults?

Vaccinations are essential for adults to protect themselves from preventable diseases and to help reduce the spread of infections to vulnerable populations. Vaccines can also provide immunity to certain illnesses, which is especially important as we age and our immune systems may weaken.

2. Which vaccines are recommended for adults?

The specific vaccines recommended for adults can vary based on factors such as age, health status, and lifestyle. However, some common vaccines recommended for adults include influenza (flu) vaccine, Tdap (tetanus, diphtheria, and pertussis) vaccine, pneumococcal vaccine, shingles vaccine, and HPV (human papillomavirus) vaccine for certain age groups.

3. How often do adults need to be vaccinated?

The vaccination schedule for adults can vary depending on the type of vaccine and individual risk factors. In general, some vaccines require periodic boosters, while others may be given once or twice in a lifetime. It's essential to consult with a healthcare provider to determine the appropriate vaccination schedule for each person.

4. Are vaccines safe?

Most people experience minimal side effects from vaccinations, such as soreness at the injection site or mild flu-like symptoms. Serious side effects are rare. It's crucial to discuss any concerns about potential side effects with a healthcare provider before receiving a vaccine.

5. Can adults get vaccinated if they have certain medical conditions?

In many cases, adults with certain medical conditions can and should get vaccinated. However, the suitability of specific vaccines may depend on the individual's health status and medical history. Those with severe allergies to vaccine components or a history of adverse reactions to vaccines may need to avoid certain vaccinations.

6. Can pregnant women receive vaccines?

Some vaccines are safe and recommended during pregnancy, such as the influenza vaccine and the Tdap vaccine. However, other live vaccines, like the MMR (measles, mumps, and rubella) vaccine, are typically not given during pregnancy. Pregnant women should consult their healthcare provider to determine which vaccines are appropriate for them.

7. Are there any vaccines recommended for Travelers?

Yes, some vaccines are recommended for Travelers, especially if they are visiting areas with specific infectious disease risks. These may include vaccines for diseases such as yellow fever, typhoid, hepatitis A, and others. Travelers should consult a healthcare provider well in advance of their trip to discuss recommended vaccinations.

8. Are vaccines covered by insurance?

Many health insurance plans cover recommended vaccinations for adults. However, coverage may vary depending on the specific insurance policy. It's best to check with the insurance provider to determine coverage details.

9. Do vaccines have damaging and long-term side-effects that are yet unknown. can vaccination be fatal?

The 1998 study which raised concerns about a possible link between measles-mumps-rubella (MMR) vaccine and autism was later found to be seriously flawed, and the paper has been retracted by the journal that published it. Vaccines are very safe. Most vaccine reactions are usually minor and temporary, such as a sore arm or mild fever. Very serious health events are extremely rare and are carefully monitored and investigated. One is far more likely to be seriously injured by a vaccine-preventable disease than by a vaccine. For example, in the case of polio, the disease can cause paralysis, measles can cause encephalitis and blindness, and some vaccine-preventable diseases can even result in death. While any serious injury or death caused by vaccines is one too many, the benefits of vaccination greatly outweigh the risk, and many, many more injuries and deaths would occur without vaccines.

10. Vaccine-preventable diseases are almost eradicated in our country, so there is no reason to be vaccinate?

Although vaccine preventable diseases have become uncommon in many countries, the infectious agents that cause them continue to circulate in some parts of the world. In a highly inter-connected world, these agents can cross geographical borders and infect anyone who is not protected. In western Europe, for example, measles outbreaks have occurred in unvaccinated populations in Austria, Belgium, Denmark, France, Germany, Italy, Spain, Switzerland and the United Kingdom since 2005. So, two key reasons to continue vaccinating are to protect ourselves and to protect those around us. Successful vaccination programmes, like successful societies, depend on the cooperation of every individual to ensure the good of all. We should not rely on people around us to stop the spread of disease; we, too, must do what we can.

11. Giving more than one vaccine at a time can increase the risk of harmful side-effects, which can overload an individual's immune system.

Scientific evidence shows that giving several vaccines at the same time has no adverse effect on immune system. People are exposed to several hundred foreign substances that trigger an immune response every day. The simple act of eating food introduces new antigens into the body, and numerous bacteria live in the mouth and nose. One is exposed to far more antigens from a common cold or sore throat than they are from vaccines. Key advantages of having several vaccines at once is fewer clinic visits, which saves time and money, and individuals are more likely to complete the recommended vaccinations on schedule. Also, when it is possible to have a combined vaccination, e.g. for measles, mumps and rubella, that means fewer injections.

12. Is it better to be immunized through disease than through vaccines?

Vaccines interact with the immune system to produce an immune response similar to that produced by the natural infection, but they do not cause the disease or put the immunized person at risk of its potential complications. In contrast, the price paid for getting immunity through natural infection might be mental retardation from Haemophilus influenzae type b (Hib), birth defects from rubella, liver cancer from hepatitis B virus, or death from measles.

Precautions & Contraindications for vaccines[53-55]

Vaccines	Contraindicated or Not Recommended	Precautions
Influenza, egg-based, inactivated injectable (IIV4)	• Severe allergic reaction (e.g., anaphylaxis) after previous dose of any influenza vaccine (i.e., any egg-based IIV, ccIIV, RIV, or LAIV of any valency) • Severe allergic reaction (e.g., anaphylaxis) to any vaccine component3 (excluding egg)	• Guillain-Barré syndrome (GBS) within 6 weeks after a previous dose of any type of influenza vaccine • Moderate or severe acute illness with or without fever
Influenza, cell culture-based inactivated injectable [(ccIIV4), Quadrivalent]	• Severe allergic reaction (e.g., anaphylaxis) to any ccIIV of any valency, or to any component 3 of ccIIV4	• GBS within 6 weeks after a previous dose of any type of influenza vaccine • Persons with a history of severe allergic reaction (e.g., anaphylaxis) after a previous dose of any egg-based IIV, RIV, or LAIV of any valency. If using ccIV4, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions. May consult an allergist. • Moderate or severe acute illness with or without fever
Influenza, recombinant injectable [(RIV4), Quadrivalent]	Severe allergic reaction (e.g., anaphylaxis) to any RIV of any valency, or to any component 3 of RIV4	• GBS within 6 weeks after a previous dose of any type of influenza vaccine. Persons with a history of severe allergic reaction (e.g., anaphylaxis) after a previous dose of any egg-based IIV, ccIIV, or LAIV of any valency. If using RIV4, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions. May consult an allergist • Moderate or severe acute illness with or without fever

Vaccines	Contraindicated or Not Recommended	Precautions
Influenza, live attenuated [LAIV4, Quadrivalent]	• Severe allergic reaction (e.g., anaphylaxis) after previous dose of any influenza vaccine (i.e., any egg-based IIV, ccIIV, RIV, or LAIV of any valency)	• GBS within 6 weeks after a previous dose of any type of influenza vaccine • Asthma in persons aged 5 years old or older
Influenza, live attenuated [LAIV4, Quadrivalent]	• Severe allergic reaction (e.g., anaphylaxis) to any vaccine component3 (excluding egg) • Anatomic or functional asplenia • Immunocompromised due to any cause including, but not limited to, medications and HIV infection • Close contacts or caregivers of severely immunosuppressed persons who require a protected environment • Pregnancy • Cochlear implant • Active communication between the cerebrospinal fluid (CSF) and the oropharynx, nasopharynx, nose, ear, or any other cranial CSF leak • Received influenza antiviral medications oseltamivir or zanamivir within the previous 48 hours, peramivir within the previous 5 days, or baloxavir within the previous 17 days.	• Persons with underlying medical conditions (other than those listed under contraindications) that might predispose to complications after wild-type influenza virus infection [e.g., chronic pulmonary, cardiovascular (except isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus)] M • Moderate or severe acute illness with or without fever
Haemophilus influenzae type b (Hib)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • History of severe allergic reaction to dry natural latex	• Moderate or severe acute illness with or without fever
Hepatitis A (Hep A)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component3 including neomycin	• Moderate or severe acute illness with or without fever
Hepatitis B (Hep B)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component3 including yeast • Pregnancy: are not recommended due to lack of safety data in pregnant persons. Use other hepatitis B vaccines if HepB is indicated	• Moderate or severe acute illness with or without fever

Vaccines	Contraindicated or Not Recommended	Precautions
Hepatitis A-Hepatitis B vaccine [Hep A-Hep B, (Twinrix®)]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component3 including neomycin and yeast	• Moderate or severe acute illness with or without fever
Human papillomavirus (HPV)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component3 • Pregnancy: HPV vaccination not recommended	• Moderate or severe acute illness with or without fever
Measles, mumps, rubella (MMR)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • Severe immunodeficiency (e.g., hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, long-term immunosuppressive therapy or patients with HIV infection who are severely immunocompromised) • Pregnancy • Family history of altered immunocompetence, unless verified clinically or by laboratory testing as immunocompetent	• Recent (≤11 mo.) receipt of antibody-containing blood product (specific interval depends on product) • History of thrombocytopenia or thrombocytopenic purpura • Need for tuberculin skin testing or interferon-gamma release assay (IGRA) testing • Moderate or severe acute illness with or without fever
Meningococcal ACWY (MenACWY)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 3 • For MenACWY-D and MenACWY-CRM only: severe allergic reaction to any diphtheria toxoid–or CRM197–containing vaccine • For MenACWY-TT only: severe allergic reaction to a tetanus toxoid-containing vaccine	• Moderate or severe acute illness with or without fever
Meningococcal B (MenB)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Pregnancy • For MenB-4C only: Latex sensitivity • Moderate or severe acute illness with or without fever

Vaccines	Contraindicated or Not Recommended	Precautions
Pneumococcal conjugate (PCV13, PCV15 & PCV20)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component3 • Severe allergic reaction (e.g., anaphylaxis) to any diphtheria-toxoid–containing vaccine or to its vaccine component	• Moderate or severe acute illness with or without fever
Pneumococcal polysaccharide (PPSV23)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever
Haemophilus influenzae type b (Hib)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • History of severe allergic reaction to dry natural latex	• Moderate or severe acute illness with or without fever
Tetanus, diphtheria, and acellular pertussis (Tdap) Tetanus, diphtheria (Td)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component3 • For Tdap only: Encephalopathy (e.g., coma, decreased level of consciousness, prolonged seizures), not attributable to another identifiable cause, within 7 days of administration of previous dose of DTP, DTaP, or Tdap	• Guillain-Barré syndrome (GBS) within 6 weeks after a previous dose of tetanus-toxoid–containing vaccine • History of Arthus-type hypersensitivity reactions after a previous dose of diphtheria-toxoid–containing or tetanus-toxoid–containing vaccine; defer vaccination until at least 10 years have elapsed since the last tetanus-toxoid–containing vaccine • Moderate or severe acute illness with or without fever • For Tdap only: Progressive or unstable neurological disorder, uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized
Chickenpox	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component3 • Severe immunodeficiency (e.g., hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, long-term immunosuppressive therapy or patients with HIV infection who are severely immunocompromised) • Pregnancy • Family history of altered immunocompetence, unless verified clinically or by laboratory testing as immunocompetent	• Moderate or severe acute illness with or without fever

Vaccines	Contraindicated or Not Recommended	Precautions
Shingles (Herpes Zoster)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever • Current herpes zoster infection
Respiratory Syncytial Virus	• History of a severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine	• Potential Risk of Preterm Birth • Immunocompromised individuals
Polio	• History of a severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine	• Pregnancy • Moderate or severe acute illness with or without fever
Cholera	• History of a severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine • aged <2 years or in adults aged ≥65 yrs	• Pregnancy & Breast Feeding • Altered Immunocompetence
Chikungunya	• History of a severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine	• History of anthrax disease • Pregnancy & Breast Feeding • Altered Immunocompetence • Moderate or severe acute illness with or without fever

Yellow Fever	• History of a severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine
	• Thymus disorder associated with abnormal immune cell function
	• Immunosuppression from the following:
	  • Symptomatic HIV infection or AIDSa
	  • Malignant neoplasms
	  • Primary immunodeficiencies
	  • Transplantation
	  • Immunosuppressive or
	  • immunomodulatory therapy
	  • Radiation therapy
		• Pregnancy
		• Breastfeeding
		• Adults ≥60 years of age
		• Asymptomatic HIV
		• infection with CD4+
		• value of 200|mm^3 – 500|mm^3

Diary for Adult Immunization

Adult Vaccination Diary

Name			
Date of Birth		Age	____ years, ___ mo.
Contact Number			

Annual Vaccines

	Dose 1	Dose 2	Dose 3	Repeat Dose	Dose Frequency
COVID-19	Today	*Not Applicable*	*Not Applicable*	1 year	Annually, only during pandemic| epidemic
Influenza	Today	*Not Applicable*	*Not Applicable*	1 year	Annually

Repeat Doses

	Dose 1	Dose 2	Dose 3	Repeat Dose	Dose Frequency
Meningococcal Conjugated	Today	14 days (for high risk conditions)	*Not Applicable*	5 year	5-yearly, if at risk
Meningococcal PBCP	Today	6 mo.	*Not Applicable*	2 year	2-3 years later, if at risk
Pneumococcal (PCV13+PPSV23)	Today (PCV13)	1 year (PPSV23)	*Not Applicable*	5 yrs (PPSV23, if needed)	Not Applicable
TdaP|Td	Today	*Not Applicable*	*Not Applicable*	10 year	10-yearly

Once in Life-time	Dose 1	Dose 2	Dose 3	Repeat Dose	Dose Frequency
Hib	Today	*Not Applicable*	*Not Applicable*	*Not Applicable*	Once in lifetime
Hepatitis A	Today	6-12 mo.	*Not Applicable*	*Not Applicable*	Once in lifetime
Hepatitis B	Today	1 mo.	6 mo.	*Not Applicable*	Once in lifetime
Chickenpox	Today	1 mo.	*Not Applicable*	*Not Applicable*	Once in lifetime
HPV	Today	1 mo.	6 mo.	*Not Applicable*	Once in lifetime
MMR	Today	1 mo.	*Not Applicable*	*Not Applicable*	Once in lifetime
RSV	Today	*Not Applicable*	*Not Applicable*	*Not Applicable*	Once in lifetime
Shingles (Herpes Zoster)	Today	2 mo.	*Not Applicable*	*Not Applicable*	Once in lifetime

Other Vaccines

_____	Today				Please refer to section on individual vaccines
_____	Today				Please refer to section on individual vaccines
_____	Today				Please refer to section on individual vaccines
_____	Today				Please refer to section on individual vaccines
_____	Today				Please refer to section on individual vaccines
_____	Today				Please refer to section on individual vaccines
_____	Today				Please refer to section on individual vaccines

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