

Table 1

Development, introduction, infectious agent, schedule, and efficacy of vaccines.

Vaccine (year introduced)	Infectious agent	Kind of vaccine first introduced	Vaccine used in present	Time for vaccination	Need of booster
Smallpox (1798)	Variola virus	Live vaccinia virus	N/A	Stopped in 1972 after eradication	N/A
not injected past normal body defenses. Like variolation					
Anthrax (1881)	<i>Bacillus anthracis</i>	Live, attenuated	Cell-free filtrates of microaerophilic cultures of a toxigenic, non-encapsulated strain of <i>B. anthracis</i> V770-NP1-R	Pre-exposure in adults ≥ 18 years old; 5 shots over 18 months	Yes; annually
Rabies (1884)	Rabies virus	Live, attenuated	Inactivated virus	Post-exposure; 4 doses (0, 3, 7, 14)	Not recommended
Typhoid (1896)	<i>Salmonella typhi</i>	Inactivated	Inactivated; live, attenuated	At risk population;	Yes if at risk; inactivated:

				inactivated: one dose; live, attenuated: 4 doses every other day	every 2 year live, attenuated: every 5 year
Cholera (1884–1896)	<i>Vibrio cholerae</i>	Live, attenuated	Oral, inactivated, killed whole cell of <i>V.</i> <i>cholerae</i>	At risk population; 2 doses 1 week apart	Yes if at risk every 6 months
Tuberculosis (1927)	<i>Mycobacterium tuberculosis</i>	Live, attenuated	N/A	Single dose for children	Not recommende
		<i>Mycobacterium bovis</i>		ORAL ONLY not injected past natural body defenses, b/c of parental objections	
Yellow fever (1935)	Yellow fever virus	Live, attenuated	Live, attenuated	Single dose ≥9 months old	Not recommende
Diphtheria and tetanus toxoids (1930s and 1940s) and acellular pertussis (dtap) ^a (1948)	<i>Corynebacterium diphtheria</i> , <i>Bordetella pertussis</i> , <i>Clostridium tetani</i>	Inactivated	Inactivated	2, 4, 6, 15– 18 months, 4–6 years	Yes; Tdap: 11–12 years; If Tdap not received between 11– 18 years, Tdap dose should be given then followed wit Td booster doses every 10 years
Poliovirus (1955)	Poliovirus	Inactivated poliovirus	Inactivated and oral, live attenuated	2, 4, 6–18 months	Yes; 4–6 years
Influenza (1954–1955)	Influenza virus	Inactivated	Inactivated and live attenuated	Annually	Not recommende
Measles, Mumps, Rubella (1971)	Measles, mumps, rubella	Inactivated	Live, attenuated	12–15 months, 4– 6 years	Not recommende
Meningococcal (1974)	<i>Neisseria meningitidis</i>	Polysaccharide	Conjugate	11–12 years	Yes; 16 year
Pneumococcal (1977)	<i>Streptococcus pneumoniae</i>	Polysaccharide	Polysaccharide- protein conjugate	2, 4, 6, 12– 15 months	Yes; if at risk, ≥65 years old
Hepatitis B (1981)	Hepatitis B virus	Plasma derived	DNA recombinant	0, 1–2, 6– 18 months	Not recommende

<i>Haemophilus influenzae</i> type b (Hib) (1985)	<i>Haemophilus influenzae</i> type B	Polysaccharide	Polysaccharide-protein conjugate	2, 4 months	Yes; 12–15 months
Japanese Encephalitis (1992)	Japanese encephalitis virus	N/A	Inactivated virus	Endemic countries: two-dose series 28 days apart	Yes; if risk of exposure
Varicella (1995)	Varicella zoster virus	Live	Live, attenuated	12–15 months, 4–6 years	Not recommended
Hepatitis A (1995)	Hepatitis A virus	Inactivated	Inactivated, whole virus	Two-dose series 6 months apart: 12–23 months old	Not recommended
Rotavirus (1998)	Rotavirus	Rhesus-based tetravalent rotavirus	RV1: live, oral, attenuated, monovalent human RV5: live, oral, attenuated, pentavalent bovine-human reassortant	RV1: 2, 4 months RV5: 2, 4, 6 months	Not recommended
Human papillomavirus (2006)	Human papillomavirus	DNA recombinant	DNA recombinant	Three-dose series starting at 11 years old: 0, 1–2, 6 months	Not recommended
Shingles (2006)	Varicella zoster virus	N/A	Live, attenuated	Single dose for people ≥60 years old	Not recommended
H1N1 (2009)	Influenza virus type A	N/A	Inactivated virus	Two doses 4 weeks apart for children aged 6 months–9 years or one dose for adults and children >10 years old	N/A