

Epidemiology and Prevention *of* Vaccine-Preventable Diseases

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Milestones in the History of Vaccination

400BCE

Hippocrates describes diphtheria, epidemic jaundice, and other conditions

1100s

Variolation for smallpox first reported in China

1721

Variolation introduced into Great Britain

1796

Edward Jenner inoculates James Phipps with cowpox, and calls the procedure vaccination ("vacca" is Latin for cow)

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Milestones in the History of Vaccination

1870
Louis Pasteur creates the first live attenuated bacterial vaccine (chicken cholera)

1884
Pasteur creates the first live attenuated viral vaccine (rabies)

1885
Pasteur first uses rabies vaccine in a human

1887
Institut Pasteur established

1900
Paul Ehrlich formulates receptor theory of immunity

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Milestones in the History of Vaccination

1901
First Nobel Prize in Medicine to von Behring for diphtheria antitoxin

1909
Theobald Smith discovers a method for inactivating diphtheria toxin

1919
Calmette and Guerin create BCG, the first live attenuated bacterial vaccine for humans

1923
First whole-cell pertussis vaccine tested
Gaston Ramon develops diphtheria toxoid

1926
Ramon and Christian Zoeller develop tetanus toxoid

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Milestones in the History of Vaccination

1927
Yellow fever virus isolated

1931
Goodpasture describes a technique for viral culture in hens' eggs

1936
Thomas Francis and Thomas Magill develop the first inactivated influenza vaccine

1948
John Enders and colleagues isolate Lansing Type II poliovirus in human cell line

1954
Enders and Peebles isolate measles virus
Francis Field Trial of inactivated polio vaccine

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Milestones in the History of Vaccination

1955
Inactivated polio vaccine
licensed

1961
Human diploid cell line
developed

1963
Measles vaccine licensed
Trivalent oral polio vaccine licensed

1965
Bifurcated needle for
smallpox vaccine licensed

1966
World Health Assembly calls for
global smallpox eradication

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Milestones in the History of Vaccination

1967

Maurice Hilleman develops Jeryl Lynn strain of mumps virus

1969

Stanley Plotkin develops RA27/3 strain of rubella vaccine virus

1971

MMR vaccine licensed

1977

Last indigenous case of smallpox (Somalia)

1979

Last wild poliovirus transmission in the U.S.

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Milestones in the History of Vaccination

1981

First hepatitis B vaccine licensed

1983

Smallpox vaccine withdrawn from civilian market

1986

First recombinant vaccine licensed (hepatitis B)
National Childhood Vaccine Injury Act

1989

Two-dose measles vaccine recommendation

1990

First polysaccharide conjugate vaccine licensed
(*Haemophilus influenzae* type b)

20 Rotavirus

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Smallpox Available online only at
<http://www.cdc.gov/nip/publications/pink/default.htm#download>

Anthrax Available online only at
<http://www.cdc.gov/nip/publications/pink/default.htm#download>

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Milestones in the History of Vaccination

1994 Polio elimination certified in the Americas Vaccines for Children program begins	1995 Varicella vaccine licensed Hepatitis A vaccine licensed First harmonized childhood immunization schedule published	1996 Acellular pertussis vaccine licensed for infants	1997 Sequential polio vaccination recommended	1998 First rotavirus vaccine licensed
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Milestones in the History of Vaccination

1999
Exclusive use of inactivated polio vaccine recommended
Rotavirus vaccine withdrawn

2000
Pneumococcal conjugate vaccine licensed for infants

2003
Live attenuated influenza vaccine licensed

2004
Inactivated influenza vaccine recommended for all children 6–23 months of age

2004
Indigenous transmission of rubella virus interrupted

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Milestones in the History of Vaccination

2005 Acellular pertussis vaccines licensed for adolescents and adults	2005 MMR-varicella (MMRV) licensed	2006 Second generation rotavirus vaccine licensed	2006 First human papillomavirus vaccine licensed	2006 First herpes zoster vaccine licensed
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Vaccines and Related Products Distributed in the United States

Vaccine/Biologic	Brand Name	Manufacturer	Type	How Supplied
Diphtheria, Tetanus, acellular Pertussis	Infanrix®	GlaxoSmithKline	Inactivated	single-dose vial or syringe
Diphtheria, Tetanus, acellular Pertussis	Tripedia®	sanofi-pasteur	Inactivated	single-dose vial
Diphtheria, Tetanus, acellular Pertussis	Daptacel®	sanofi-pasteur	Inactivated	single-dose vial
Diphtheria, Tetanus, acellular Pertussis + Hib	TriHIBit®	sanofi-pasteur	Inactivated	single-dose vial
Diphtheria, Tetanus, acellular Pertussis +Hep B + IPV	Pediarix®	GlaxoSmithKline	Inactivated	single-dose vial or syringe
Diphtheria, Tetanus (DT; ped <7yrs, P-free)	generic	sanofi-pasteur	Inactivated	single-dose vial
Tetanus, diphtheria, adsorbed (Td; ≥7yrs, P-free)	Decavac®	sanofi-pasteur	Inactivated	single-dose syringe
Tetanus, diphtheria, adsorbed (Td; ≥7yrs)	generic	Mass Biologic Labs	Inactivated	15-dose vial
Tetanus, diphtheria, acellular Pertussis (Tdap; 10-18 yrs)	Boostrix®	GlaxoSmithKline	Inactivated	single-dose vial or syringe
Tetanus, diphtheria, acellular Pertussis (Tdap; 11-64 yrs)	Adacel™	sanofi-pasteur	Inactivated	single-dose vial
Tetanus toxoid (TT; ≥7 yrs) adsorbed	generic	sanofi-pasteur	Inactivated	10-dose vial
Tetanus toxoid (TT; adult booster use only)	generic	sanofi-pasteur	Inactivated	15-dose vial
Tetanus immune globulin (TIG)	HyperTET™	Talecris	Human immunoglobulin	single-dose syringe
<i>Haemophilus influenzae</i> type b (PRP-T)	ActHIB®	sanofi-pasteur	Inactivated	single-dose vial
<i>Haemophilus influenzae</i> type b (HbOC)	HibTITER®	Wyeth	Inactivated	single-dose vial
<i>Haemophilus influenzae</i> type b (PRP-OMP)	PedvaxHIB®	Merck	Inactivated	single-dose vial
<i>Haemophilus influenzae</i> type b (PRP-OMP) + Hep B	Comvax®	Merck	Inactivated	single-dose vial
Hepatitis A: ped/adol & adult formulations	Havrix®	GlaxoSmithKline	Inactivated	single-dose vial or syringe
Hepatitis A: ped/adol & adult formulations	Vaqta®	Merck	Inactivated	single-dose vial or syringe
Hepatitis A immune globulin	GamaSTAN™	Talecris	Human immunoglobulin	2 mL and 10 mL vials
Hepatitis B: ped/adol & adult formulations	Engerix-B®	GlaxoSmithKline	Inactivated	single-dose vial or syringe
Hepatitis B: ped/adol & adult formulations	Recombivax HB®	Merck	Inactivated	single-dose vial
Hepatitis B dialysis formulation	Recombivax HB®	Merck	Inactivated	single-dose vial
Hepatitis B immune globulin (HBIG)	HyperHEP B™	Talecris	Human immunoglobulin	1 mL syringe, 1 mL or 5 mL vial
Hepatitis B immune globulin (HBIG): ped formulation	HyperHEP B™	Talecris	Human immunoglobulin	single-dose 0.5 mL neonatal syringe
Hepatitis B immune globulin (HBIG)	Nabi-HB®	Nabi	Human immunoglobulin	single-dose vial
Hepatitis A & B: adult formulation	Twinrix®	GlaxoSmithKline	Inactivated	single-dose vial or syringe
Human papillomavirus (HPV)	Gardasil®	Merck	Inactivated	single-dose vial or syringe
Influenza (trivalent inactivated influenza vaccine [TIV])	Fluarix®	GlaxoSmithKline	Inactivated	10 single-dose syringes
Influenza (live attenuated influenza vaccine [LAIV])	FluMist®	Medimmune	Live, intranasal	10 single-use sprayers
Influenza (TIV)	Fluvirin®	Novartis	Inactivated	single-dose syringe & 10-dose vial
Influenza (TIV)	Fluzone®	sanofi-pasteur	Inactivated	10-dose vial
Influenza (TIV; ≥36 mos; no preservative)	Fluzone®	sanofi-pasteur	Inactivated	single-dose syringe (0.5 mL)
Influenza (TIV; ped 6-35 mos; no preservative)	Fluzone®	sanofi-pasteur	Inactivated	single-dose syringe (0.25 mL)
Influenza (TIV; ≥18 yrs)	FluLaval™	GlaxoSmithKline	Inactivated	10-dose vial
Measles, Mumps, Rubella (MMR)	M-M-R II®	Merck	Live, attenuated	single-dose vial
Measles	Attenuvax®	Merck	Live, attenuated	single-dose vial
Mumps	MumpsVax®	Merck	Live, attenuated	single-dose vial
Rubella	Meruvax II®	Merck	Live, attenuated	single-dose vial
Measles, Mumps, Rubella + Varicella (MMRV)	ProQuad®	Merck	Live, attenuated	single-dose vial
Meningococcal conjugate (A/C/Y/W-135)	Menactra®	sanofi-pasteur	Inactivated	single-dose vial
Meningococcal polysaccharide (A/C/Y/W-135)	Menomune®	sanofi-pasteur	Inactivated	single-dose vial
Pneumococcal conjugate, 7-valent	Prevnar®	Wyeth	Inactivated	single-dose vial
Pneumococcal polysaccharide, 23-valent	Pneumovax 23®	Merck	Inactivated	single-dose vial or 5-dose vial
Polio (IPV)	IPOL®	sanofi-pasteur	Inactivated	single-dose syringe or 10-dose vial
Rotavirus	RotaTeq®	Merck	Live, oral	single-dose tube
Varicella	Varivax®	Merck	Live, attenuated	single-dose vial
Varicella Zoster Immune Globulin (VZIG) (IND)	VariZIG™	Cangene	Human Immunoglobulin	125-U vial
Zoster	Zostavax®	Merck	Live, attenuated	single-dose vial
Anthrax, adsorbed	BioThrax™	BioPort	Inactivated	multi-dose vial
Japanese encephalitis	JE-VAX®	sanofi-pasteur	Inactivated	single-dose vial
Rabies	Imovax®	sanofi-pasteur	Inactivated	single-dose vial
Rabies	RabAvert®	Novartis	Inactivated	single-dose vial
Rabies Immune Globulin (RIG)	Imogam Rabies-HT®	sanofi-pasteur	Human immunoglobulin	2 mL and 10 mL vials
Rabies Immune Globulin (RIG)	HyperRAB™	Talecris	Human immunoglobulin	2 mL and 10 mL vials
Typhoid VI polysaccharide	Typhim Vi®	sanofi-pasteur	Inactivated	single-dose syringe and 20-dose vial
Typhoid, live oral Ty21a	Vivotif®	Berna	Live, attenuated	4-capsule package
Yellow Fever	YF-Vax®	sanofi-pasteur	Live, attenuated	single- and 5-dose vial

(Adapted from Immunization Action Coalition Item #P2019) February 2007