

Vaccination

History

1,000-2,000 yrs BC – variolization in the Old China and India

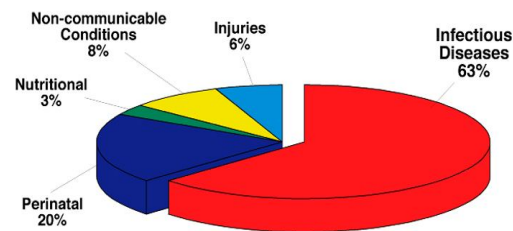
1846 – the variolization institute in London

1796 – E. Jenner – vaccination..

1885 – Pasteur – rabies etc.

1892-4 – cholera, typhoid fever

Leading Causes of Death Worldwide: Children <5 Years



Source: WHO, 1999

Types of vaccines

- ❖ **live attenuated** – BCG, polio, MMR, yellow fever
- ❖ **inactivated** – flu, pertussis....
- ❖ **inactivated toxoids** – diphtheria, tetanus
- ❖ **polysaccharides** – conjugated vs. unconjug. pneumo, meningoc, Hib, typhoid fever
- ❖ **synthetic recombinant, DNA vaccines** – future

Comparison of 20th Century Estimated Annual Morbidity and Current Reported Morbidity Vaccine-Preventable Diseases (pre-1990 Vaccines)

Disease	20 th Century Estimated Annual Morbidity [†]	2004 Reported Cases ^{††}	Percent Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Measles	4,000,000	37	99.9%
Mumps	162,344	258	99.8%
Pertussis	200,752	25,827	87.1%
Polio (paralytic)	16,316	0	100%
Rubella	47,745	10	99.9%
Congenital Rubella Syndrome	152	0	100%
Tetanus	580	34	94.1%

[†] Unpublished CDC data, reported December 2005
^{††} CDC. *MMWR* August 12, 2005. 54(31); 770 and CDC. *MMWR* December 2, 2005. 54(47);1214

Vaccine schedule in the Czech Rep

Age	No. of dose	Preventable infectious diseases (abbreviated)
newborns	1	tuberculosis (TB) - selective
9-12 weeks	1	
1 month after dose 1	2	diphtheria, tetanus, pertussis, <i>Haemophilus influenzae</i> type b invasive infection, hepatitis B, polio (DTaP/HIB/HepB/IPV; hexavaccine)
1 month after dose 2	3	
6 months after dose 3 (not later than 18 months)	4	+ pneumococcal invasive infection (PCV, 10-or 13-valent pneumococcal conjugate vaccine)
15 months	1	measles, mumps, rubella (MMR)
6-10 months after dose 1	2	
5-6 years	booster	diphtheria, tetanus, pertussis (DTaP)
10-11 years	booster	diphtheria, tetanus, pertussis, polio (Tdap+IPV)
25-26 years	booster	tetanus

Contraindications

2 absolute contraindications valid for all vaccines:

- a serious systemic adverse reaction after a previous vaccination with a given vaccine
- acute illness with a moderate or severe course

Live vaccines are usually contraindicated in pregnant women and immunocompromised persons.

In all borderline situation a physician should assess the risk of disease, the benefit of vaccination and the risk associated with vaccination.

Passive immunization

Disease	Immunoglobulin and indications
tetanus	human, specific; indicated after a potential exposure to tetanus in high risk persons with insufficient levels of antibodies after previous active immunization
rabies	human, specific; indicated together with active immunization after exposure to a potentially rabid animal
hepatitis B	human, specific; indicated in newborns of HBs+ mothers or persons with high risk contact with hepatitis B (e.g., non-immune health care personnel)
hepatitis A	human, non-specific; indicated in pregnant women after exposure to hepatitis A virus, in other exposed persons active immunization only is preferred
chicken pox	human, specific; indicated in pregnant women, newborns to mothers with chicken pox erupted 5 days before or 2 days after delivery and other high risk persons

Travelers – 3R principle

- **Routine** – tetanus, pertussis, polio, diphtheria, MMR
- **Required** - yellow fever, /meningococcus/
- **Recommended** – viral hepatitis A+B, typhoid fever, meningococcus A+C+W135+Y, rabies, japanese encephalitis

“No one is interested in the millions of cases of diphtheria that don’t occur because of immunization, or of cholera that is prevented because of a pure water supply.”

W.Hobson

P.S. Until they occur