

Vaccination = Artificial but ACTIVE immunity. Goal = provide adequate "Herd" Immunity.

An "Ideal Vaccine" has certain characteristics (hypothetical):

1. Easy administration
2. Long term protection
3. No side effects
4. No reversion (return to virulence due to back mutation)

Types of Vaccines: (all contain needed antigens to stimulate an immune response or ACTIVE immunity)

A. **Attenuated** (modified live organism) — viable but weakened organism that is unable to cause disease.

Advantage: can reproduce in host and therefore provides strong and long term immunity.

Disadvantage: has possibility to revert and cause disease. Should only use in healthy individuals

B. **Killed** - organism is killed and unable to metabolize or reproduce.

Advantage: cannot revert nor cause disease. Use in compromised host

Disadvantage: immune response is usually weaker and shorter in duration; repeated inoculations

C. **Subunit (acellular)** — contains only the strongest and most protective antigens from the pathogen.

Advantage: Stronger response than killed vaccines and no possibility of reversion

Disadvantage: Usually not as strong as attenuated vaccine

D. **Conjugated** — Attaches a typically weak but important antigen to a protein to enhance the strength of the immune response.

Advantage/Disadvantage: Similar to subunit

E. **Toxoids** - Not directed at pathogen but a substance released by the pathogen. Typically a protein toxin.

Advantage: Usually strong and lasting immune response, unable to cause disease

Antitoxins, Antiserums, Immunoglobulins, Gammaglobulins — Antibodies (NOT antigens) that are manufactured or made by another organism. These provide (PASSIVE- immunity).

Advantage: Immediate protection

Disadvantage: Short term protection; no cellular immunity, may blunt active immunity of host

