Live Attenuated Vaccines

Live attenuated vaccines are weakened versions of the virus against which the patient is being vaccinated. They are reduced in virulence, but still viable and therefore "live". These viruses or bacteria are attenuated, or weakened, in a laboratory, usually by repeated culturing. They induce both humoral and cell-mediated immunity but on rare occasion may revert to virulent strains, which is why in general they should not be given to immunocompromised patients. Live attenuated vaccines produce immunity in most recipients with one dose, except those administered orally. Examples of these vaccines include varicella (chickenpox), zoster, (shingles), polio (Sabin), smallpox, yellow fever, influenza (intranasal), MMR, rotavirus, typhoid fever, and BCG.



PLAY PICMONIC

Characteristics

Humoral and Cellular Immune Response
Hummer-in-Moon and Basketball and Tennis Ball
Live attenuated vaccines induce humoral/antibody-mediated and cell-mediated components of the immune system. They do this via activation of T and B cells. T cells become activated when the live virus is inoculated into the host and enters various cell types. The associated proteins are proteolysed within the cell and presented via MHC-I to circulating T-cells. B cells become activated when circulating dendritic cells phagocytose the viral vaccine and present the antigens via MHC-II to plasma cells, leading to their maturation into memory B-cells.

May Revert to Virulent Form
Devil Standing in Corner
Theoretically, live attenuated vaccines could revert to their virulent form, causing infectious symptoms in the host. Immunocompromised patients are especially susceptible to this. Currently, the only live attenuated vaccine known to actually do this is the oral polio (Sabin) vaccine.

Do Not Require Boosters
No-Sign over Rocket Booster
Live attenuated vaccines generally do not require boosters as they induce memory B-cells to produce circulating antibodies, providing a much longer-lasting immunity.

Vaccines

Varicella (Chickenpox)
Varsity-Zorro Chicken-box
The Varicella zoster virus (VZV) vaccine for chickenpox is a live attenuated vaccine often given to children.

Zoster (Shingles)
Zorro Shingles
There are currently two vaccines for shingles - Zostavax and Shingrix. The older one, Zostavax, is a live attenuated vaccine and can be given to healthy adults over age 60 to prevent shingles. Zostavax is contraindicated in immunosuppressed patients. The newer one, Shingrix, is much more effective and is a recombinant vaccine indicated for adults over age 50 regardless of whether they had chickenpox.

Polio (Sabin)
Saber-Polo Player with Pill
The Sabin polio vaccine is a live-attenuated virus. It was administered orally but is no longer available in the United States.

Smallpox
Small Fox
The vaccine for smallpox is a live-attenuated vaccine. It is not routinely administered.

Sign up for FREE at picmonic.com

Yellow Fever

Yellow Fever Beaver

The vaccine for yellow fever is a live-attenuated vaccine.

Influenza (Intranasal)

Flute-Virus with Nose

The intranasal influenza vaccine is a live-attenuated vaccine.

MMR

M&M-aRt Syringe

The vaccine for measles, mumps, and rubella (MMR) is a live-attenuated vaccine. It is the only live attenuated vaccine that can be given to AIDS patients given its safety profile.

Rotavirus

Rotor-virus

The vaccine for rotavirus is a live attenuated vaccine. It is unique in that it is first given at 6 weeks of age when most live attenuated vaccines are not given until 9 months of age.

Typhoid Fever (Oral)

Typhoon Fever-beaver

There are several vaccines for typhoid fever, caused by Salmonella typhi. The oral vaccine (Ty21a) is a live attenuated vaccine.

BCG (Bacillus Calmette-Guérin)

Beast-G

Previously used for tuberculosis, the BCG vaccine is no longer administered for this purpose. Instead, it is used in certain urological malignancy treatments.

Sign up for FREE at picmonic.com