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Inactivated Vaccines: An Overview

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Abstract

An inactivated vaccine stimulates the immune system to defend the body from infection by using a killed virus or bacteria. The bacteria or virus can't replicate or cause disease because it's dead. Though inactivated vaccines have the same purposes as live vaccines—namely, to produce antibodies that battle or organize the immune system's defenses—they appear to evoke a weaker response, necessitating several doses and/or booster shots to achieve the same degree of immunity.

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Introduction

Types of inactivated vaccines

The US Food and Drug Administration have approved 85 single and combination vaccines for use (FDA). A limited number of inactivated vaccines, also known as whole-killed vaccines, protect against the diseases mentioned below: Hepatitis A is a disease that affects the liver (given by injection in two doses), Influenza virus (given as a flu shot annually), Encephalitis in Japan (given by injection in two doses), Poliomyelitis (given by injection in five doses for children and three for adults), Rabies is an infectious illness (given by injection in three doses), Typhoid fever (given as a single shot before travel to an endemic region). Some inactivated vaccines, such as those for cholera and plague, are no longer available in the United States.

Advantage and Disadvantages

Every vaccine has advantages and disadvantages. In certain cases, there is only one vaccine version available, making any distinction useless. Nonetheless, knowing how inactivated vaccines function will help you understand why vaccine doses vary and why some are more expensive than others.

Vaccine durability

The term "vaccine longevity" refers to how long a vaccine remains safe. In comparison to live vaccines, inactivated vaccines have a shorter shelf life than live vaccines. This is because the immune system can better "recognize" a bacteria or virus that actively reproduces even though it doesn't cause disease.

Inactivated vaccines can require up to five doses to achieve optimum safety, while live vaccines usually only require one or two. A live vaccine, such as the measles,

mumps, and rubella (MMR) vaccine, needs only one dose but provides adequate lifetime defense.

For anyone living in the remote wilderness, an inactivated vaccine like the one used for rabies might be needed every six months to two years. The typhoid vaccine, for example, needs two doses every two years for those living in endemic areas. Although subunit vaccines are theoretically inactivated, they do not contain the entire pathogen (but rather a fragment of one) and are therefore classified as a separate vaccine group. Since the fragment was chosen for its strong antigenic (immune-stimulating) effect, their response is more robust than inactivated vaccines. Despite this, booster shots for subunit vaccines are often needed to maintain immune defense.

Storage and Shipping

Live vaccines, on the other hand, frequently necessitate special handling and storage. While this is not a major issue in the United States, it does cause problems in areas with limited resources. As a result of the shorter shelf life, this demand can raise costs and result in wastage. Live vaccinations, on the other hand, often necessitate special handling and storage. Although this is not a major issue in the United States, it does cause issues in regions with limited resources. As a result of the shorter shelf life, this demand may raise costs and result in wastage.

Vaccine Safety

Most people may receive inactivated vaccines because the dead virus has no chance of causing disease. Live vaccines, on the other hand, have a slim risk of reverting to their original state and causing disease in people with weakened immune systems. This involves organ transplant recipients who are on immunosuppressive medications, HIV patients, and cancer patients who are undergoing chemotherapy. While not all live vaccines must be prevented, the benefits and risks must be considered before administering such vaccines.