



VACCINIA INFECTION

What is it?

Vaccinia belongs to a family of viruses that is closely related to the smallpox virus. Because of the similarities between the smallpox and vaccinia viruses, the vaccinia virus is used in the smallpox vaccine. When this virus is used as a vaccine, it allows our immune systems to develop immunity against smallpox. The smallpox vaccine does not actually contain smallpox virus and cannot cause smallpox. Vaccination usually prevents smallpox infection for at least ten years.

The vaccinia vaccine against smallpox was used to successfully eradicate smallpox from the human population. More recently, this virus has also become of interest due to concerns about smallpox being used as an agent of bioterrorism.

How is the virus spread?

Vaccinia can be spread by touching the vaccination site before it has fully healed or by touching clothing or bandages that have been contaminated with the live virus during vaccination. In this manner, vaccinia can spread to other parts of the body and to other individuals. It cannot be spread through the air.

What are the symptoms of vaccinia?

Vaccinia virus symptoms are similar to smallpox, but milder. Vaccinia may cause rash, fever, headache and body aches. In certain individuals, such as those with weak immune systems, the symptoms can be more severe.

What are the potential side effects of the vaccinia vaccine for smallpox?

Normal reactions are mild and go away without any treatment. These include:

- Soreness and redness in the arm where the vaccine was given
- Slightly swollen, sore glands in the armpits
- Low grade fever
- One in approximately three people will feel badly enough to miss school, work or recreational activities
- Trouble sleeping

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Serious reactions are not very common but can occur in about 1,000 in every 1 million people who are vaccinated for the first time. These reactions are not life threatening, but do require some medical attention. They include:

- A vaccinia rash or outbreak from accidentally touching the vaccination site and

spreading the vaccinia virus (see Figure 1). Usual areas include the genitals, face and eyes, where the damage can lead to blindness. To help prevent this complication, a person must remember to wash their hands with soap and water after touching the vaccination site.

Figure 1:

Vaccinia Rash

<http://www.cfsph.iastate.edu/DiseaseInfo/ppt/SmallpoxMonkeypox.ppt>



- Widespread vaccinia rash- this occurs when the vaccinia virus spreads from the vaccination site into the bloodstream. In this case, the rash will occur in parts of the body away from the vaccination site.
- Toxic or allergic reaction in response to the vaccine. This can present like any other allergic response and can be mild or severe.

Life-threatening reactions from vaccinia are rare. These occur in between 14 to 52 people in 1 million who are vaccinated for the first time, especially in those with skin disease or weakened immune systems.

These reactions require immediate medical attention and include:

- Eczema vaccinatum- this is a serious skin rash that is caused by widespread infection of the skin in people who have prior skin conditions such as eczema or atopic dermatitis.
- Progressive vaccinia- uncontrolled spread of the vaccinia virus to nearby tissues resulting in tissue death
- Post- vaccination encephalitis- vaccinia infection that spreads to the brain after vaccination along with an over-response to the vaccine (an inflammatory immune response).
- Myocarditis or pericarditis- this is inflammation of the heart and is caused by the body's over responsiveness to the vaccine.

CDC estimates 1 or 2 in 1 million people may die as a result of vaccination.

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Who should not get the smallpox vaccine?

Side effects are more likely in a person who:

- Currently has, or has a history of, skin conditions such as eczema or atopic dermatitis.
- Has a weakened immune system, such as those who have HIV, have received a transplant, or are receiving treatment for cancer.

Any person who falls in these categories or lives with a person who falls in these categories should **NOT** get the vaccine unless they are exposed to the disease.

Other categories of people that should **NOT** get the vaccine are:

- Pregnant women
- Women who are breastfeeding
- anyone who is allergic to the vaccine or any of its components
- Children younger than 12 months of age
- Children younger than 18 years of age or adults older than 65 years of age (unless it is in an emergency situation)
- Anyone using steroid eye drops
- Anyone who has been diagnosed with heart disease with or without symptoms. This could include individuals with angina (chest pain), previous heart attacks, shortness of breath, congestive heart failure, cardiomyopathy, stroke or a transient ischemic attack (“mini-stroke”)
- If a person has more than three of the following conditions:
 - High blood pressure
 - A first degree relative (mother, father or sibling) who had a heart condition before the age of 50
 - High cholesterol
 - Diabetes
 - Current smoker

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For More Information and Frequently Asked Questions (FAQs), Check Out:

- Occupational Safety & Health Administration (OSHA):
<http://www.osha.gov/SLTC/smallpox/index.html>
- Centers for Disease Control and Prevention (CDC):
<http://www.bt.cdc.gov/agent/smallpox/vaccination/faq.asp#vaccinia>
 - CDC, Frequently Asked Questions About Smallpox Vaccine:
<http://www.bt.cdc.gov/agent/smallpox/vaccination/faq.asp>
 - CDC, The Live Virus Smallpox Vaccine:
<http://www.bt.cdc.gov/agent/smallpox/vaccination/live-virus.asp>
- National Institute of Allergy and Infectious Diseases (NIAID):
<http://www.niaid.nih.gov/TOPICS/SMALLPOX/Pages/prevention.aspx>