

What is hand, foot, and mouth disease?

Hand, foot, and mouth disease (HFMD) is a common illness of infants and children. It is characterized by fever, sores in the mouth, and a rash with blisters. HFMD begins with a mild fever, poor appetite, malaise ("feeling sick"), and frequently a sore throat. One or 2 days after the fever begins, painful sores develop in the mouth. They begin as small red spots that blister and then often become ulcers. They are usually located on the tongue, gums, and inside of the cheeks. The skin rash develops over 1 to 2 days with flat or raised red spots, some with blisters. The rash does not itch, and it is usually located on the palms of the hands and soles of the feet. It may also appear on the buttocks. A person with HFMD may have only the rash or the mouth ulcers.

Is HFMD the same as foot-and-mouth disease?

No. HFMD is often confused with foot-and-mouth disease of cattle, sheep, and swine. Although the names are similar, the two diseases are not related at all and are caused by different viruses. For information on foot-and-mouth disease, please visit the web site of the US Department of Agriculture at <http://www.aphis.usda.gov/lpa/issues/fmd/fmd.html>

What causes HFMD?

Viruses from the group called enteroviruses cause HFMD. The most common cause is coxsackievirus A16; sometimes, HFMD is caused by enterovirus 71 or other enteroviruses. The enterovirus group includes polioviruses, coxsackieviruses, echoviruses and other enteroviruses.

Is HFMD serious?

Usually not. HFMD caused by coxsackievirus A16 infection is a mild disease and nearly all patients recover without medical treatment in 7 to 10 days. Complications are uncommon. Rarely, the patient with coxsackievirus A16 infection may also develop "aseptic" or viral meningitis, in which the person has fever, headache, stiff neck, or back pain, and may need to be hospitalized for a few days. Another cause of HFMD, EV71 may also cause viral meningitis and, rarely, more serious diseases, such as encephalitis, or a poliomyelitis-like paralysis. EV71 encephalitis may be fatal. Cases of fatal encephalitis occurred during outbreaks of HFMD in Malaysia in 1997 and in Taiwan in 1998.

Is HFMD contagious?

Yes, HFMD is moderately contagious. Infection is spread from person to person by direct contact with nose and throat discharges, saliva, fluid from blisters, or the stool of infected persons. A person is most contagious during the first week of the illness. HFMD is not transmitted to or from pets or other animals.

How soon will someone become ill after getting infected?

The usual period from infection to onset of symptoms ("incubation period") is 3 to 7 days. Fever is often the first symptom of HFMD.

Who is at risk for HFMD?

HFMD occurs mainly in children under 10 years old, but may also occur in adults too. Everyone is at risk of infection, but not everyone who is infected becomes ill. Infants, children, and adolescents are more likely to be susceptible to infection and illness from these viruses, because they are less likely than adults to have antibodies and be immune from previous exposures to them. Infection results in immunity to the specific virus, but a second episode may occur following infection with a different member of the enterovirus group.

What are the risks to pregnant women exposed to children with HFMD?

Because enteroviruses, including those causing HFMD, are very common, pregnant women are frequently exposed to them, especially during summer and fall months. As for any other adults, the risk of infection is higher for

pregnant women who do not have antibodies from earlier exposures to these viruses, and who are exposed to young children - the primary spreaders of enteroviruses.

Most enterovirus infections during pregnancy cause mild or no illness in the mother. Although the available information is limited, currently there is no clear evidence that maternal enteroviral infection causes adverse outcomes of pregnancy such as abortion, stillbirth, or congenital defects. However, mothers infected shortly before delivery may pass the virus to the newborn. Babies born to mothers who have symptoms of enteroviral illness around the time of delivery are more likely to be infected. Most newborns infected with an enterovirus have mild illness, but, in rare cases, they may develop an overwhelming infection of many organs, including liver and heart, and die from the infection. The risk of this severe illness in newborns is higher during the first two weeks of life.

Strict adherence to generally recommended good hygienic practices by the pregnant woman (see "[Can HFMD be prevented?](#)" below) may help to decrease the risk of infection during pregnancy and around the time of delivery.

When and where does HFMD occur?

Individual cases and outbreaks of HFMD occur worldwide, more frequently in summer and early autumn. In the recent past, major outbreaks of HFMD attributable to enterovirus 71 have been reported in some South East Asian countries (Malaysia, 1997; Taiwan, 1998).

How is HFMD diagnosed?

HFMD is one of many infections that result in mouth sores. Another common cause is oral herpesvirus infection, which produces an inflammation of the mouth and gums (sometimes called stomatitis). Usually, the physician can distinguish between HFMD and other causes of mouth sores based on the age of the patient, the pattern of symptoms reported by the patient or parent, and the appearance of the rash and sores on examination. A throat swab or stool specimen may be sent to a laboratory to determine which enterovirus caused the illness. Since the testing often takes 2 to 4 weeks to obtain a final answer, the physician usually does not order these tests.

How is HFMD treated?

No specific treatment is available for this or other enterovirus infections. Symptomatic treatment is given to provide relief from fever, aches, or pain from the mouth ulcers.

Can HFMD be prevented?

Specific prevention for HFMD or other non-polio enterovirus infections is not available, but the risk of infection can be lowered by good hygienic practices. Preventive measures include frequent handwashing, especially after diaper changes (see "Handwashing" in: "An Ounce of Prevention: Keeps the Germs Away" at <http://www.cdc.gov/ncidod/op/handwashing.htm>), cleaning of contaminated surfaces and soiled items first with soap and water, and then disinfecting them by diluted solution of chlorine-containing bleach (made by mixing approximately ¼ cup of bleach with 1 gallon of water. (See more about cleaning and disinfecting in general at <http://www.cdc.gov/ncidod/op/cleaning.htm>). Avoidance of close contact (kissing, hugging, sharing utensils, etc.) with children with HFMD may also help to reduce of the risk of infection to caregivers.

HFMD in the childcare setting

HFMD outbreaks in child care facilities occur most often in the summer and fall months, and usually coincide with an increased number of cases in the community.

CDC has no specific recommendations regarding the exclusion of children with HFMD from child care programs, schools, or other group settings. Children are often excluded from group settings during the first few days of the illness, which may reduce the spread of infection, but will not completely interrupt it. Exclusion of ill persons may not prevent additional cases since the virus may be excreted for weeks after the symptoms have disappeared. Also, some persons excreting the virus, including most adults, may have no symptoms. Some benefit may be gained, however, by excluding children who have blisters in their mouths and drool or who have weeping lesions on their hands.

If an outbreak occurs in the child care setting:

- Make sure that all children and adults use good handwashing technique, especially after diaper changes.
- Thoroughly wash and disinfect contaminated items and surfaces using diluted solution of chlorine-containing bleach.

See the section "[Can HFMD be prevented?](#)" to learn more about hygienic practices which may be helpful in preventing HFMD transmission.