# FIFTH DISEASE
(Erythema Infectiosum)

## REPORTING INFORMATION
Not a reportable disease. Information is included to assist in differentiating Fifth Disease from other reportable rash illnesses, such as measles.

## AGENT
Human Parvovirus B19 (HPV-B19). No association with the animal parvovirus.

## CASE DEFINITION
The Centers for Disease Control and Prevention (CDC) has not published a case definition for this illness.

## SIGNS AND SYMPTOMS
Fifth Disease is so called because at the turn of the century it was considered the fifth exanthematous disease of childhood (after rubella, rubeola, scarlet fever and epidemic pseudoscarlatina). Fifth Disease is moderately contagious, affecting mainly children 4-10 years of age. It may be asymptomatic, produce a febrile illness with mild flu-like symptoms only or produce a rash illness. Rash illness often begins with the sudden appearance of livid erythema of the cheeks, giving a characteristic "slapped cheek" appearance. Mild fever may be present. The rash spreads to the trunk and extremities and is mildly pruritic; it soon fades with central clearing, giving a lacy or reticulated appearance. The rash usually disappears within one week but may reappear during periods of exercise, warm baths, rubbing the skin or emotional upset. Adults may develop arthritic symptoms, fever and adenopathy. In healthy children, the disease is relatively benign. The rash may come and go for several weeks.

## DIAGNOSIS
Fifth Disease should be differentiated from rubella, enteroviral diseases, systemic lupus erythematosis, atypical measles and drug rashes. Although the following methods are not recommended for routine diagnostic purposes, current or recent infection with human parvovirus can be diagnosed by detection of the virus by immunological or nucleic acid hybridization techniques. Parvovirus specific antibody can be detected using RIA or ELISA in immunoassays. The presence of IgM antibody alone or with IgG is indicative of an acute infection. IgG alone indicates prior infection and hence, immunity. If the test results are negative for both antibodies, the individual has no immunity to Fifth Disease and is considered susceptible. IgM antibody to HPV-B19 appears 12-15 days after inoculation, and IgG antibody 17-20 days after infection.

## EPIDEMIOLOGY
### Source
Infected, viremic individuals are the only source of human parvovirus.

### Occurrence
Disease occurs worldwide. It is recognized most commonly during epidemics, usually occurring in spring, peaking in March, April or May. Secondary attack rate in households is approximately 50%. It is estimated that >50% of all adults have antibody to HPV-B19.

### Mode of Transmission
Spread from person-to-person. Blood products may be vehicles of transmission, but

respiratory droplets are by far the most important means of spread.

**Period of Communicability**
The rash apparently occurs after the disappearance of viremia, suggesting the rash is mediated by the immune response to parvovirus. The highest period of contagiousness is felt to be in the five days before the onset of the rash and, to a lesser degree, two days after.

**Incubation Period**
Estimated to be 4-14 days, usually 12-14 days.

## PUBLIC HEALTH MANAGEMENT

**Case**
The local health department may assist schools and other institutions in education about the disease, particularly in the event of an outbreak.

Treatment
None.

Isolation
Isolation is not required, since the illness is mild, the duration of the rash may be prolonged, and the greatest contagiousness occurs in the five days preceding the onset of the rash. Children with this disease should not be excluded from school or child care settings.

**Contact**s
Generally, no specific management is required. However, viremia due to human parvovirus has been described as the principal cause of aplastic crisis in sickle cell anemia patients. It may be prudent to notify parents or guardians of a child with sickle cell disease, or other types of hemolytic disorders, if their child has been exposed to Fifth Disease.

Several recent studies have demonstrated that a small percentage (0.5%-3.3%) of pregnant women who become infected with HPV-B19 experience miscarriages, abortions and late fetal deaths, largely as a result of fetal hydrops. In the majority of women who are infected during pregnancy, the pregnancy proceeds normally to term and survivors show no abnormalities.

**Prevention and Control**
There is no vaccine and in general no preventive measures are necessary. As with all viruses transmitted by respiratory secretions, careful hand washing and care in handling soiled tissues will help prevent spread of the disease. There are several factors to be considered when dealing with concerns of pregnant women in school and day care settings where Fifth Disease outbreaks are occurring.

- The greatest contagiousness occurs in the five days preceding the onset of the rash, so by the time an outbreak is recognized exposure has probably already occurred.
- Exposure can occur elsewhere, in the community or at home.
- The risk is small and seems to be confined to the first 20 weeks of pregnancy.
- To be effective, exclusion would be necessary from the time an outbreak is recognized until 21 days after the onset of illness of the last reported case. This may involve several months.

Any decision about pregnancy management should be addressed by the attending physician.

**What is "Fifth Disease?"**
Fifth Disease is a mild rash illness that occurs most commonly in children. The ill child typically has a "slapped-cheek" rash on the face and a lacy red rash on the trunk and limbs. Occasionally, the rash may be itchy. An ill child can have a low-grade fever, malaise or a "cold" a few days before the rash breaks out. The child is usually not very ill, and the rash resolves in 7-10 days.

**What causes Fifth Disease?**
Fifth Disease is caused by infection with human parvovirus B19. This virus infects only humans. Pet dogs or cats can be immunized against "parvovirus" but these are animal parvoviruses that do not infect humans. A person cannot "catch" parvovirus from a pet dog or cat, and a pet cat or dog cannot catch human parvovirus B19 from an ill person.

**Can adults develop Fifth Disease?**
Yes. An infected adult may have no symptoms or may develop the typical rash, joint pain and swelling. The joints most frequently affected are the hands, wrists and knees. The joint pain and swelling usually resolve in a week or two, but may last several months. About 50% of adults have been previously infected with parvovirus B19, have developed immunity to the virus and cannot get Fifth Disease.

**Is Fifth Disease contagious?**
Yes. A person infected with parvovirus B19 is contagious during the early part of the illness, before the rash appears. By the time a child has the characteristic "slapped cheek" rash of Fifth Disease, for example, he or she is probably no longer contagious and may return to school or child care center. This contagious period is different than that for many other rash illnesses, such as measles, for which the child is contagious while he or she has the rash.

**How does someone become infected with parvovirus B19?**
Parvovirus B19 has been found in the respiratory secretions (e.g. saliva, sputum, or nasal mucus) of infected persons before the onset of rash, when they appear to "just have a cold." The virus is probably spread from person-to-person by direct contact with those secretions, such as sharing drinking cups or utensils. In a household, as many as 50% of susceptible persons exposed to a family member who has Fifth Disease may become infected. During school outbreaks, 10% to 60% of students may develop Fifth Disease.

**How soon after infection with parvovirus B19 does a person become ill?**
A susceptible person usually becomes ill 4-14 days after being infected with the virus, but may become ill as long as 20 days after infection.

**Does everyone who is infected with parvovirus B19 become ill?**
No. During outbreaks of Fifth Disease, about 20% of adults and children who are infected with parvovirus B19 do not develop any symptoms. Furthermore, other persons infected with the virus will have a non-specific illness that is not characteristic of Fifth Disease. Persons infected with the virus, regardless of symptoms, develop lasting immunity that protects them from future infection.

**How is Fifth Disease diagnosed?**
A physician can often diagnose Fifth Disease by seeing the typical rash during a physical examination. In cases in which it is important to confirm the diagnosis, a blood test is available to detect antibodies to parvovirus. Antibodies are proteins produced by the immune system in response to parvovirus B19 and other germs. If immunoglobulin M (IgM) antibody to parvovirus B19 is detected, this suggests that the person has had a recent infection.

**Is Fifth Disease serious?**
Fifth Disease is usually a mild illness that resolves on its own among children and adults who are otherwise healthy. Joint pain and swelling in adults usually resolve without long-term disability.

Parvovirus B19 infection can cause an acute, severe anemia in persons with sickle cell disease or similar types of chronic anemia. The typical rash of Fifth Disease is rarely seen in these persons. Once the infection is controlled, the anemia resolves. People who have leukemia or cancer, who are born with immune deficiencies, who have received an organ transplant or who have human immunodeficiency virus (HIV) infection are at risk for serious illness due to parvovirus B19 infection. Infected persons who have problems with their immune systems may also develop a chronic anemia that requires medical treatment. Fewer than 5% of pregnant women infected with fifth disease may experience miscarriage, most commonly occurring during the first half of pregnancy. There is no evidence that parvovirus B19 infection causes birth defects or mental retardation.

**How are parvovirus B19 infections treated?**
Treatment of symptoms such as fever, pain or itching is usually all that is needed for Fifth Disease. Adults with joint pain and swelling may need to rest, restrict their activities and use medicines such as aspirin or ibuprofen to relieve symptoms. The few people who have severe anemia caused by parvovirus B19 infection may need to be hospitalized and receive blood transfusions. Persons with immune problems may need special medical care, including treatment with immune globulin (antibodies), to help their bodies eliminate the infection.

**Can parvovirus B19 infection be prevented?**
There is no vaccine or medicine that prevents parvovirus B19 infection. Frequent hand washing is recommended as a practical and probably effective method of preventing transmission. Excluding persons with Fifth Disease from work, child care centers or schools is not likely to prevent the spread of the virus, since people are contagious before they develop the rash.

The Centers for Disease Control and Prevention (CDC) does not recommend that pregnant women should routinely be excluded from a workplace where a fifth disease outbreak is occurring, because exposure would have occurred prior to outbreak discovery. Rather, the decision to stay away from a workplace where there are cases of fifth disease is a personal decision for a woman to make, after discussions with her family, physician and employer.