CONDITION

CMV

Learn how cytomegalovirus spreads, who is at risk, how CMV is diagnosed and treated, and when symptoms need prompt medical care.

WHAT IT IS
Common lifelong herpesvirus infection

BODY SYSTEM
Multiple body systems

MAIN SYMPTOMS
Fever, tiredness, sore throat, swollen lymph nodes

WHAT CAUSES IT
Viral infection through body fluids

HOW IT IS DIAGNOSED
PCR testing of blood or body fluids

MAIN TREATMENT
Supportive care or antiviral medicines

CAN IT BE CURED?
No, virus remains for life

IS IT AN EMERGENCY?
Sometimes, with severe breathing difficulty

LONG-TERM OUTLOOK
Usually good in healthy people, variable with congenital or immune-compromised disease

Overview

Cytomegalovirus, usually called CMV, is a common virus in the herpesvirus family. Other members of this virus family include the viruses that cause chickenpox and cold sores. CMV is not the same as either of those infections.

After a person is infected, CMV remains in the body for life in an inactive, or latent, state. It may become active again later. This is called reactivation. A person can also be infected with a different strain of CMV.

Most healthy children and adults have no symptoms or only a mild illness. CMV matters most during pregnancy and in people with weakened immune systems. If CMV passes to a fetus during pregnancy, the baby has congenital CMV. Some affected babies develop hearing loss, vision problems, developmental disability, or other health concerns.

CMV can also cause serious organ disease in people whose immune defenses are reduced. This includes some organ or stem cell transplant recipients, people receiving certain cancer treatments, and people with advanced HIV. The specific risk depends on the person's health, medicines, and previous exposure to CMV.

Symptoms

Most people do not know when they acquire CMV. When symptoms occur in an otherwise healthy person, they may resemble mononucleosis. Possible symptoms include:

These symptoms can have many other causes. Symptoms alone cannot confirm CMV.

CMV disease in someone with a weakened immune system may affect specific organs. Eye infection, called CMV retinitis, can cause blurred vision, floaters, blind spots, or loss of vision. Inflammation of the digestive tract may cause pain with swallowing, abdominal pain, diarrhea, or bleeding. Lung disease may cause cough, low oxygen levels, or shortness of breath. CMV can also affect the liver, brain, or nervous system.

Most babies with congenital CMV appear healthy at birth. Some later develop hearing loss, which may affect one or both ears and can worsen over time.

Babies who have symptoms at birth may be small, have a small head size, develop jaundice, or have an enlarged liver or spleen. Other signs include a purple-red pinpoint rash, low platelet counts, seizures, feeding problems, or abnormal findings on brain imaging.

Sudden vision changes require urgent same-day assessment, especially in someone with a weakened immune system. Severe trouble breathing, a seizure, fainting, confusion, or uncontrolled bleeding requires emergency care. A newborn with poor feeding, unusual sleepiness, jaundice, breathing difficulty, or seizure-like activity also needs prompt medical assessment.

- Fever, tiredness, sore throat, or swollen lymph nodes
- Muscle aches or headache
- Reduced appetite
- Mild inflammation of the liver, sometimes found through blood tests

Causes and risk factors

CMV spreads through direct contact with infected body fluids. These can include saliva, urine, blood, semen, vaginal fluids, tears, and breast milk. Transmission may occur through close

household contact, sexual contact, pregnancy, birth, breastfeeding, blood products, or a transplanted organ.

Young children can release, or shed, CMV in saliva and urine for months after infection. People who frequently care for young children may therefore have repeated exposure. CMV does not usually spread through brief casual contact. Cleaning hands after changing diapers, helping with toileting, or touching saliva reduces exposure.

During pregnancy, CMV can cross the placenta and infect the fetus. This can happen after a first CMV infection, after reactivation, or after infection with a different CMV strain. A first infection during pregnancy is more likely to be transmitted than a past infection that becomes active again, but either situation can lead to congenital CMV. A maternal infection does not mean that the fetus is infected or will have health problems.

The risk of serious CMV disease is higher when immune function is significantly reduced. Important settings include:

No CMV vaccine is currently available. Practical risk reduction during pregnancy includes washing hands with soap and water after contact with a young child's urine or saliva and avoiding the sharing of food, drinks, eating utensils, or toothbrushes with young children. These measures reduce exposure but cannot eliminate all risk.

- Solid organ or stem cell transplantation
- Advanced or untreated HIV
- Certain blood cancers, chemotherapy treatments, or immune-suppressing medicines
- A fetus or newborn infected before birth

Diagnosis

The right test depends on why CMV is suspected.

Blood antibody tests can show whether a person has been exposed to CMV. CMV IgG antibodies usually indicate infection at some point in the past. CMV IgM antibodies may occur with a recent first infection, reactivation, or for other reasons. An IgM result by itself cannot reliably identify when infection happened.

An IgG avidity test measures how strongly IgG antibodies bind to the virus. When interpreted with other results, it may help estimate whether a first infection was recent. Testing can be difficult to interpret, so results during pregnancy are often reviewed with an obstetric or maternal-fetal medicine specialist.

A polymerase chain reaction, or PCR, test looks for CMV genetic material. PCR can be

performed on blood, urine, saliva, spinal fluid, amniotic fluid, or tissue, depending on the situation. In transplant recipients and some other immunocompromised patients, repeated blood PCR tests may be used to follow the amount of virus and guide management.

Maternal blood tests do not diagnose congenital CMV in a fetus. If concern remains during pregnancy, a specialist may discuss amniotic fluid PCR. The timing of this test in relation to the suspected infection and stage of pregnancy affects its accuracy. Ultrasound may identify findings associated with congenital infection, but a normal ultrasound cannot rule it out.

Congenital CMV is diagnosed by testing a newborn's saliva, urine, or sometimes blood within the first two to three weeks after birth. Testing after that period may not distinguish infection acquired before birth from infection acquired during or after delivery. A positive saliva result is generally confirmed with urine because breast milk can contaminate a saliva sample.

A baby diagnosed with congenital CMV may need hearing and eye examinations, blood tests, and brain imaging. These tests help identify organ involvement and guide decisions about treatment and follow-up.

Diagnosing CMV organ disease in an immunocompromised person may require more than a positive blood PCR. An eye examination, endoscopy, biopsy, imaging, or fluid testing may be needed to show that CMV is causing symptoms in a particular organ.

Treatment and management

Most healthy people with mild CMV illness do not need antiviral treatment. Rest, fluids, and follow-up with a clinician are usually appropriate. Persistent fever, worsening symptoms, or significant liver test abnormalities may require additional evaluation for CMV or another condition.

Antiviral medicines are used when CMV is causing or is likely to cause serious disease. Ganciclovir and its oral form, valganciclovir, are commonly used in selected patients. Other medicines may be considered for resistant virus, medication toxicity, or particular transplant situations. Treatment decisions depend on the organ affected, immune status, laboratory results, and response to therapy.

These medicines can have important adverse effects. Ganciclovir and valganciclovir can lower white blood cells, red blood cells, or platelets. Some CMV medicines can affect kidney function or interact with other drugs. Blood counts, kidney function, and CMV levels may need regular monitoring. Treatment should be directed by a clinician experienced in CMV care.

For transplant recipients, management may include preventive antiviral medicine or frequent PCR monitoring followed by early treatment if the virus appears. The approach varies

according to the type of transplant, the CMV status of the donor and recipient, immune-suppressing medicines, and local transplant protocols.

Antiviral treatment may be offered to certain newborns with symptomatic congenital CMV, especially when the brain, nervous system, or other organs are involved. Research has shown that valganciclovir can improve some hearing and developmental outcomes in selected infants, but it also carries risks. A pediatric infectious disease specialist usually helps the family weigh potential benefits, side effects, and the need for months of laboratory monitoring. The benefit for babies with isolated hearing loss or no symptoms is less certain.

There is no routinely approved treatment that can guarantee prevention of fetal CMV infection after maternal infection. Pregnant patients with concerning test results should receive individualized counseling rather than starting medication on their own.

Complications

In healthy adults and children, lasting complications are uncommon. Tiredness may continue for several weeks after a mononucleosis-like illness. Rarely, CMV can cause inflammation of the liver, nervous system, heart, lungs, or blood cells.

Untreated CMV organ disease in a severely immunocompromised person can lead to permanent vision loss, intestinal injury, breathing problems, neurologic damage, or other serious illness. CMV may also affect the health of a transplanted organ and increase the risk of other infections.

Congenital CMV has a wide range of outcomes. Many children remain healthy. Others may develop:

A child's condition at birth does not predict every later outcome. This is why hearing and developmental follow-up remain important even when the newborn examination is normal.

- Hearing loss that is present at birth or appears later
- Vision impairment
- Delayed speech, movement, or learning
- Seizures or cerebral palsy
- Feeding or growth problems

Follow up

Routine follow-up depends on the setting. A healthy person recovering from mild CMV may only need review if symptoms persist or worsen.

A person with reduced immune function should follow the monitoring plan from their transplant, cancer, HIV, or infectious disease team. Keeping scheduled blood tests and reporting new symptoms early can help identify CMV before major organ injury develops.

Children with congenital CMV need repeated hearing checks because hearing loss may appear or progress after the newborn period. Depending on the child's findings, follow-up may also include eye examinations, developmental screening, physical or speech therapy, neurology care, and early-intervention services. Families should keep these appointments even if the child seems well.

Contact a clinician promptly for new vision changes, ongoing fever, worsening diarrhea, pain with swallowing, jaundice, unusual bruising, or reduced feeding in an infant. Seek emergency care for severe breathing difficulty, seizure, sudden confusion, fainting, or rapidly worsening illness.

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