MUSC
MEDICAL UNIVERSITY of SOUTH CAROLINA

Lab Tests and Results

Cytomegalovirus nucleic acid assay, Qualitative

What is this test?

This test detects and measures the amount of nucleic acid (building blocks of genes) of a type of virus called cytomegalovirus (CMV). It is used to evaluate and manage infections and diseases caused by this virus[1][2][3][4][5]. This test may be used when a CMV infection is suspected in newborn babies[6][7][8] or in immunocompromised patients[1][9][4]. A sample of blood, urine, cerebrospinal fluid, saliva, bronchoalveolar lavage, throat cells and mucus, amniotic fluid, intraocular fluid, dried blood spots, or other body fluid or tissue may be collected for this test[2][7][9][3][4].

What are other names for this test?

Cytomegalovirus nucleic acid detection

What are related tests?

Cytomegalovirus culture
Cytomegalovirus antigen assay
Cytomegalovirus nucleic acid assay, Quantitative

Why do I need this test?

Laboratory tests may be done for many reasons. Tests are performed for routine health screenings or if a disease or toxicity is suspected. Lab tests may be used to determine if a medical condition is improving or worsening. Lab tests may also be used to measure the success or failure of a medication or treatment plan. Lab tests may be ordered for professional or legal reasons. The following is a possible reason why this test may be done:

CMV infection - Cytomegalovirus infection
Congenital cytomegalovirus infection

When and how often should I have this test?

When and how often laboratory tests are done may depend on many factors. The timing of laboratory tests may rely on the results or completion of other tests, procedures, or treatments. Lab tests may be performed immediately in an emergency, or tests may be delayed as a condition is treated or monitored. A test may be suggested or become necessary when certain signs or symptoms appear.

Due to changes in the way your body naturally functions through the course of a day, lab tests may need to be performed at a certain time of day. If you have prepared for a test by changing your food or fluid intake, lab tests may be timed in accordance with those changes. Timing of tests may be based on increased and decreased levels of medications, drugs or other substances in the body.

The age or gender of the person being tested may affect when and how often a lab test is required. Chronic or progressive conditions may need ongoing monitoring through the use of lab tests. Conditions that worsen and improve may also need frequent monitoring. Certain tests may be repeated to obtain a series of results, or tests may need to be repeated to confirm or disprove results. Timing and frequency of lab tests may vary if they are performed for professional or legal reasons.

How should I get ready for the test?

Venous blood:

Before having blood collected, tell the person drawing your blood if you are allergic to latex. Tell the healthcare worker if you have a medical condition or are using a medication or supplement that causes excessive bleeding. Also tell the healthcare worker if you have felt nauseated, lightheaded, or have fainted while having blood drawn in the past.

Urine:

To prepare for giving a urine sample, be sure to drink enough fluids before the test, unless you have been given

other instructions. Try not to empty your bladder before the test.

Cerebrospinal fluid:

A lumbar puncture is a procedure that requires your written consent. Review the consent form with the healthcare worker and ask any questions that you have before signing the consent form. You may receive certain medications and need imaging tests done prior to the procedure.

Tell the person doing the lumbar puncture if you have a medical condition or are using a medication or supplement that causes excessive bleeding. Contact the healthcare worker if you have a history of chronic back pain, structural defects in your spine, or a past spinal surgery. Tell the healthcare worker if you have an infection on your back or if you have any psychiatric or neurological (nerve) conditions. You should also report if you have a history of allergic other reactions to local anesthetics.

Saliva:

There is no preparation needed for this test.

Bronchial sample:

A bronchoscopy is a procedure that requires your written consent. Review the consent form with the healthcare worker and ask any questions that you have before signing the consent form. Tell the healthcare worker if you have a history of nosebleeds, throat infections, chest pain, heart conditions, or a recent heart attack. Inform the healthcare worker if you have a medical condition or are using a medication or supplement that causes excessive bleeding. You should also report if you have a history of allergic or other reactions to topical anesthetics.

Throat cells/mucus:

There is no preparation needed for this test.

Amniotic fluid:

An amniocentesis is a procedure that requires your written consent. Review the consent form with the healthcare worker and ask any questions that you have before signing the consent form. Tell the person doing the amniocentesis if you have a history of pregnancy difficulties, such as premature (early) labor, incompetent cervix (a weak or failing cervix), placenta previa (a placenta that is abnormally low, near or over the cervix), abruptio placentae (the placenta is separated from the uterine wall too early), and if you are Rh negative (had a blood type that did not match your child's blood type). Tell the healthcare worker if you have a medical condition or are using a medication or supplement that causes excessive bleeding. You should also report if you have a history of allergic or other reactions to local anesthetics. If ultrasound is used, you will need to drink extra fluids and have a full bladder for the procedure.

Other body fluid or tissue samples:

A different sample other than the samples listed above may be used for this test. Ask your healthcare worker for information about how to prepare for this test. If you have questions or concerns about the preparation for this test, talk to the healthcare worker.

How is the test done?

A sample of blood, urine, cerebrospinal fluid, saliva, bronchoalveolar lavage, throat cells and mucus, amniotic fluid, intraocular fluid, dried blood spots, or other body fluid or tissue may be collected for this test.

Venous blood:

When a blood sample from a vein is needed, a vein in your arm is usually selected. A tourniquet (large rubber strap) may be secured above the vein. The skin over the vein will be cleaned, and a needle will be inserted. You will be asked to hold very still while your blood is collected. Blood will be collected into one or more tubes, and the tourniquet will be removed. When enough blood has been collected, the healthcare worker will take the needle out.

Urine:

To provide a sample of urine, you will be asked to urinate into a container. Fill the container as much as you can, but do not overfill it. Urine samples may also be taken from a catheter.

Cerebrospinal fluid:

Cerebrospinal fluid is the fluid that surrounds the brain and spinal cord tissues. The procedure that collects a sample of cerebrospinal fluid is called a lumbar puncture. For this procedure, you may need to lie on your side facing away from the person performing the procedure. You may be asked to roll up into a ball with your knees

brought close to your chest. This position allows your spine to spread apart slightly and helps direct needle placement. This procedure may also be done while you are in an upright sitting position, with your knees drawn up toward your chest.

An area in the lower back will be chosen for the needle insertion site. This is about at the level of the top of your hip bone. Your skin will be cleaned with antiseptic and the area will be draped with sterile cloth. Local anesthetic will be injected with a small needle to numb the area. Anesthetic cream may also be applied. After the anesthetic has taken effect, the lumbar puncture needle is inserted between the vertebrae and into the spinal column. Cerebrospinal fluid is drawn out for testing and the needle is removed. You may need to change positions during the procedure if the healthcare worker is having difficulty collecting a sample of fluid. This procedure may be done more than one time if collecting cerebrospinal fluid is difficult.

Saliva:

Saliva samples may be collected by having you spit into a plastic tube several times or by using a swab. For the swab method you will need to open your mouth wide. The person doing the test will use a long, sterile cotton swab to wipe the inside of your cheeks. The swab may be rubbed several times to collect the sample. Do not close your mouth when the sample is being collected. After the sample has been collected, the swab will be taken out and tested.

Bronchial sample:

A bronchial (lower airway) sample is collected during a bronchoscopy. During a bronchoscopy, bronchial cells and secretions may be collected using one or more of several different methods.

A bronchoscopy is done with general anesthesia or conscious sedation. Your vital signs will be monitored and a ventilator may assist your breathing. The bronchoscope, a flexible fiberoptic instrument, is passed through your nose or mouth. If the scope is passed through your mouth, a bite block may be used to protect your teeth. The bronchoscope then passes through your airways and into your lung. A topical anesthetic is often sprayed down the tube to prevent coughing during the procedure.

During the bronchoscopy, your airways are inspected and samples of cells or tissue may be collected using bronchioalveolar lavage, bronchial brushing, and/or bronchial biopsy. A bronchioalveolar lavage is done by placing the tip of the bronchoscope into an area of your lung. Saline solution is injected and drawn out through the scope. This procedure is usually repeated several times to collect samples of cells and secretions from different areas of the lungs. During bronchial brushing, a small brush within the scope is used to collect samples of cells from the lung. When a biopsy is needed, an instrument located within the scope is used to collect samples of tissue from the lung.

Throat cells/mucus:

A throat culture is done to collect mucus and cells from the back of your throat. For a throat culture, you will need to open your mouth wide. The person doing the test will use a long, sterile cotton swab to swab the back of your throat, near your tonsils. The swab may be rubbed several times to obtain the sample. Do not close your mouth when the sample is being collected. After the sample has been collected, the swab will be taken out and tested.

Amniotic fluid:

Amniotic fluid is the protective liquid that surrounds the unborn baby while it is in the mother's womb. A sample of this fluid is collected by a procedure called an amniocentesis. For an amniocentesis, you will lie on your back with your legs extended. You may be asked to raise your arms above your head. Usually, an ultrasound will be done at the same time as the amniocentesis. The ultrasound is used to locate your unborn baby, the placenta, and a pocket of amniotic fluid that is suitable for testing. The point selected for needle insertion will be away from your baby and the placenta.

An area of skin on your abdomen will be cleaned with an antiseptic solution, and a sterile area prepared. You will be given anesthetic to numb your skin. When the area is numb, a needle will be introduced through your skin and into the amniotic sac (the protective sac that surrounds the unborn baby). Using ultrasound as a guide for needle placement, a small amount of amniotic fluid will be withdrawn and thrown away, and then the sample of fluid will be collected.

When enough fluid has been collected, the needle will be withdrawn. More than one needle and syringe may be needed to collect the sample. If your unborn baby moves toward the needle during the procedure, the needle will be withdrawn and the procedure may need to be repeated.

Other body fluid or tissue samples:

A different sample other than the samples listed above may be used for this test. Methods used to collect other body fluids or tissue samples may vary. Ask the healthcare worker to explain how this sample may be collected. If you have questions or concerns about this test, talk to the healthcare worker.

How will the test feel?

The amount of discomfort you feel will depend on many factors, including your sensitivity to pain. Communicate how you are feeling with the person doing the test. Inform the person doing the test if you feel that you cannot continue with the test.

Venous blood:

During a blood draw, you may feel mild discomfort at the location where the blood sample is being collected.

Urine:

This test usually causes no discomfort.

Cerebrospinal fluid:

Before a lumbar puncture, a local anesthetic is given to the procedure site to numb the area. You may feel mild discomfort or stinging when the numbing medicine is injected. You may feel a pressure, a popping sensation, and discomfort when the procedure needle is inserted. Tell the person doing the test if you feel pain or numbness down your leg during the procedure. You may have back discomfort for several days after the procedure.

Saliva:

This test usually causes no discomfort.

Bronchial sample:

During a bronchoscopy, general anesthetic or conscious sedation may be used. General anesthesia is done by an anesthesiologist. You receive medicine that puts you into a deep sleep where you are unable to feel pain. With conscious sedation, you receive medicine that puts you in a dream-like state, where you should not feel pain or remember the procedure. However, you are still awake enough to move and respond to directions. After the procedure, you may have a sore throat or cough for several days

Throat cells/mucus:

During a throat culture, you may feel mild discomfort at the back of your throat when the sample is collected. You may feel like gagging or coughing. You may have a mild sore throat briefly after the procedure.

Amniotic fluid:

Before an amniocentesis, a local anesthetic is given to the procedure site to numb the area. You may feel mild discomfort or stinging when the numbing medicine is injected. As the procedure needle is inserted through the abdomen, you may feel some discomfort and pressure. You may feel mild cramping in your abdomen and pelvic area during the procedure. The procedure site may be sore for several days.

Other body fluid or tissue samples:

A different sample other than the samples listed above may be used for this test. This test may feel different depending on many factors, including the sample needed and how it is collected. Ask the healthcare worker what to expect during this test.

What should I do after the test?

Venous blood:

After a blood sample is collected from your vein, a bandage, cotton ball, or gauze may be placed on the area where the needle was inserted. You may be asked to apply pressure to the area. Avoid strenuous exercise immediately after your blood draw. Contact your healthcare worker if you feel pain or see redness, swelling, or discharge from the puncture site.

Urine:

After collecting a urine sample, close the container if it has a lid. Place the container where the healthcare worker asked you to put it. Clean your hands with soap and water.

Cerebrospinal fluid:

After the lumbar puncture is complete, a bandage will be placed over the site and pressure held until the bleeding or drainage has stopped. You will need to lie flat for at least 1 to 2 hours after the lumbar puncture. Healthcare workers will monitor for drainage from the puncture site for a period of time after the test. You may be able carefully

turn from your back to your side. You will be offered fluids to drink.

Saliva:

There are no special instructions to follow after this test.

Bronchial sample:

Following a bronchoscopy and collection of a sample of cells or tissue, you will need to rest until healthcare workers say that you are able to leave the facility. You can usually eat and drink as you normally do soon after the procedure. You may have a sore, dry throat for a short time, and you may develop a slight fever the evening after the procedure.

Contact your healthcare worker if you cough up significant amounts of bright red or dark-colored blood, or have a high fever, which remains for several days. Contact your healthcare worker immediately if you have sudden or a new-onset of chest pain, shortness of breath, wheezing, or other difficulty breathing.

Throat cells/mucus:

There are no special instructions to follow after this test.

Amniotic fluid:

After an amniocentesis, a bandage will be placed over the site, and pressure applied until the bleeding or drainage has stopped. Rest is necessary. Do not have sexual intercourse, and avoid heavy lifting for at least 24 hours after the procedure.

Contact your healthcare worker if there is redness, swelling, pus, drainage, or pain at the site where the amniotic fluid sample was taken. Alert your healthcare worker immediately if you see bleeding or clear fluid leaking from your vagina, feel severe cramping in your abdominal or pelvic area, or develop a fever. Inform healthcare workers of any change in your baby's movement, such as not moving for a period of time, or suddenly moving more than usual after this procedure.

Other body fluid or tissue samples:

A different sample other than the samples listed above may be used for this test. Instructions for what to do after a collection of other body fluid or tissue samples may vary. Ask the healthcare worker to instruct you on what to expect after this test is completed. If you have questions or concerns about what to expect after the test is completed, talk to the healthcare worker.

What are the risks?

Blood: During a blood draw, a hematoma (blood-filled bump under the skin) or slight bleeding from the puncture site may occur. After a blood draw, a bruise or infection may occur at the puncture site. The person doing this test may need to perform it more than once. Talk to your healthcare worker if you have any concerns about the risks of this test.

Urine: A urine test is generally considered safe. Talk to your healthcare worker if you have questions or concerns about this test.

Cerebrospinal fluid: Cerebrospinal fluid is collected by a procedure called a lumbar puncture. The most common risk of a lumbar puncture is spinal fluid leakage from the puncture site. This procedure may cause a mild to severe headache, which may last for several days. Although rare, other risks include infection, nerve injury, bleeding in the spinal canal, and damage to the discs in between your spine. If you have a medical condition, or are using a medication or supplement that causes excessive bleeding, you are at a higher risk of bleeding from the puncture site. If you have a condition where you have increased pressure within your skull, such as a traumatic head injury or a large brain tumor, this procedure carries a risk of brain herniation (where the skull contents are pressed down on to the spinal cord causing brain damage). The person doing this test may need to perform it more than once. Talk to your healthcare worker if you have any concerns about the risks of this procedure.

Bronchial samples: A bronchial (lower airway) sample is collected by a procedure called a bronchoscopy. This procedure may require sedation (putting you to sleep), which has its own risks. If the bronchoscope is passed through your nose, there is a risk of damage to the inside of your nose. If the bronchoscope is passed through your mouth, there is a risk of damage to your mouth and throat. A bronchoscopy can irritate the airways and lungs. Commonly, a mild sore throat or cough is experienced after the procedure. You may have a fever that comes and goes for a few days. You may also feel chest or back discomfort for a few days.

Less common risks of a bronchoscopy include lung bleeding, hemoptysis (coughing up blood), lung infection, and bronchospasm (sudden, short-term narrowing of the airways). Additionally, there is a risk of damage to the airways and lungs, including the possibility of a pneumothorax (collapsed lung) or decreased lung function. You may have

difficulty breathing after this procedure. If you have a medical condition, or are using a medication or supplement that causes excessive bleeding, you are at a higher risk of bleeding from this procedure. The person doing this procedure may need to perform it more than once. Talk to your healthcare worker if you have any concerns about the risks of this procedure.

Throat cells/mucus: A throat culture is generally considered safe. Talk to your healthcare worker if you have questions or concerns about the risks of a throat culture.

Amniotic Fluid: Amniotic fluid is collected by a procedure called an amniocentesis. During an amniocentesis a hematoma (blood-filled bump under the skin) or bleeding at the puncture site may occur. If you have a medical condition, or are using a medication or supplement that causes excessive bleeding, you are at a higher risk of bleeding from the puncture site. It is possible that the needle that is used to collect fluid will injure your baby. After an amniocentesis, a bruise or infection may occur at the puncture site. You may bleed or leak amniotic fluid from the vagina. Rarely, you may develop a fever, have severe abdominal and pelvic cramping, or go into labor. There is a risk that your baby will not survive the procedure. The chances of these risks vary depending on your health status, the reason for having this procedure, and other factors. The person doing this test may need to perform it more than once. Talk with your healthcare worker if you have any concerns about the risks of having an amniocentesis.

Other body fluid or tissue samples: A different sample other than the samples listed above may be used for this test. Ask your healthcare worker to explain the risks of this test to you. If you have questions or concerns about this test, talk to the healthcare worker.

What are normal results for this test?

Laboratory test results may vary depending on your age, gender, health history, the method used for the test, and many other factors. If your results are different from the results suggested below, this may not mean that you have a disease. Contact your healthcare worker if you have any questions. The following is considered to be a normal result for this test:

Adults and children: No virus detected [4][10]

What follow up should I do after this test?

Ask your healthcare worker how you will be informed of the test results. You may be asked to call for results, schedule an appointment to discuss results, or notified of results by mail. Follow up care varies depending on many factors related to your test. Sometimes there is no follow up after you have been notified of test results. At other times follow up may be suggested or necessary. Some examples of follow up care include changes to medication or treatment plans, referral to a specialist, more or less frequent monitoring, and additional tests or procedures. Talk with your healthcare worker about any concerns or questions you have regarding follow up care or instructions.

Cerebrospinal fluid:

You may experience headaches for hours to days, or even weeks after a lumbar puncture. The headaches are usually worse when sitting or standing upright and are relieved by lying down. Headaches are often associated with nausea, a stiff neck, tinnitus (ringing in the ears), photophobia (abnormal sensitivity to or intolerance of light), vertigo (dizziness), and blurred vision. Contact your healthcare worker if your symptoms worsen.

Amniotic fluid:

After an amniocentesis, results are usually available within 7 to 10 days.

Other body fluid and tissue samples:

A different sample other than the samples listed above may be collected for this test. Ask the healthcare worker for follow up care instructions after this test.

Where can I get more information?

Related Companies

Centers for Disease Control and Prevention (CDC)

References

1. Griffiths P: Cytomegalovirus infection of the central nervous system. Herpes 2004; 11(Suppl 2):95A-104A.
2. Tarrago D, Mateos ML, Avellon A, et al: Quantitation of cytomegalovirus DNA in cerebrospinal fluid and serum specimens from AIDS patients using a novel highly sensitive nested competitive PCR and the cobas amplicor CMV monitor. J Med Virol 2004; 72(2):249-256.

3. Grangeot-Keros L & Cointe D: Diagnosis and prognostic markers of HCMV infection. J Clin Virol 2001; 21 (3):213-221.
4. Blank BS, Meenhorst PL, Mulder JW, et al: Value of different assays for detection of human cytomegalovirus (HCMV) in predicting the development of HCMV disease in human immunodeficiency virus-infected patients. J Clin Microbiol 2000; 38(2):563-569.
5. Tietz NW (Ed): Clinical Guide to Laboratory Tests, 3rd ed. W. B. Saunders, Philadelphia, PA, 1995.
6. Demmler GJ: Screening for congenital cytomegalovirus infection: a tapestry of controversies. J Pediatr 2005; 146:162-164.
7. Ross SA & Boppana SB: Congenital cytomegalovirus infection: outcome and diagnosis. Semin Pediatr Infect Dis 2004; 16:44-49.
8. Yamamoto AY, Mussi-Pinhata MM, Cristina P, et al: Congenital cytomegalovirus infection in preterm and full-term newborn infants from a population with a high seroprevalence rate. Pediatr Infect Dis J 2001; 20(2):188-192.
9. Diaz-Mitoma F, Leger C, Miller H, et al: Comparison of DNA amplification, mRNA amplification, and DNA hybridization techniques for detection of cytomegalovirus in bone marrow transplant recipients. J Clin Microbiol 2003; 41(11):5159-5166.
10. Nelson CT, Istas AS, Wilkerson MK, et al: PCR detection of cytomegalovirus DNA in serum as a diagnostic test for congenital cytomegalovirus infection. J Clin Microbiol 1995; 33(12):3317-3318.