Tests Explained

Infectious Disease

- **Measles**

  Measles is a disease caused by a virus. Symptoms include fever, cough, runny nose, red eyes and a generalized rash.

  Measles is spread through respiration (contact with fluids from an infected person's nose and mouth, either directly or through aerosol transmission), and is highly contagious. 90% of people without immunity sharing a house with an infected person will contract it. The incubation period usually lasts for 4–12 days (during which there are, by definition, no symptoms). Infected people remain contagious from the appearance of the first symptoms until 3–5 days after the rash appears.

  'German measles' is an unrelated condition caused by the rubella virus.

  We test for the presence of antibodies in the blood against this virus. Presence of antibodies indicates that the individual has immunity against measles.

- **Mumps**

  Mumps or epidemic parotitis is a viral disease of humans. Prior to the development of a vaccine, it was a common childhood disease worldwide, and is still a significant threat to health in the third world.

  Painful swelling of the salivary glands (classically the parotid gland) is the most typical presentation. Painful testicular swelling and rash may also occur. The symptoms are generally not severe in children. In teenage males and men, complications such as infertility or sub-fertility are more common, although still rare in absolute terms. The disease is generally self-limited, running its course before receding, with no specific treatment apart from controlling the symptoms with painkillers.

  We test for the presence of antibodies in the blood against this virus, presence of

antibodies indicates that the individual has immunity against mumps.

- **Rubella**

  It is a viral disease known as German measles because the disease was first described by German physicians in the mid-eighteenth century. This disease is often mild, and can last one to three days. Children recover more quickly than adults. Infection of the mother by Rubella virus during pregnancy can be serious. If the mother is infected within the first 20 weeks of pregnancy, the child may be born with congenital rubella syndrome (CRS), which comprises a range of serious incurable illnesses. The developing fetus may suffer blindness, heart defects, hearing defects, musculoskeletal defects and mental retardation. Spontaneous abortion occurs in up to 20% of cases.

  Acquired rubella, (i.e. not congenital) is transmitted via airborne droplet transmission from the upper respiratory tract of active cases. The virus may also be present in the urine, feces and on the skin. There is no carrier state: the reservoir exists entirely in active human cases. The disease has an incubation period of 2 to 3 weeks.

  In most people the virus is rapidly eliminated. However, it may persist for some months post partum in infants surviving CRS. These children are a significant source of infection to other infants and, more importantly, to pregnant female contacts.

  We test for the presence of antibodies against Rubella to confirm the existence of adequate protection against the rubella virus and to detect a recent or past infection. It is also used to identify those who have never been exposed to the virus or have not been vaccinated. This test is ordered on all pregnant women and those planning to become pregnant to verify that they have a sufficient amount (titer) of rubella antibodies to protect them from infection.

- **VZV**

  VZV is a DNA virus and is a member of the herpes virus group. Like other herpes viruses, VZV has the capacity to persist in the body after the primary (first) infection as a latent infection. VZV persists in sensory nerve ganglia. Primary infection with VZV results in chickenpox. Herpes zoster (shingles) is the result of reactivation of latent VZV infection. The virus is believed to have a short survival time in the environment.

  The onset of maternal varicella from 5 days before to 2 days after delivery may result in overwhelming infection of the neonate and a fatality rate as high as 30%. This severe disease is believed to result from fetal exposure to varicella virus without the benefit of passive maternal antibody. Infants born to mothers with onset of maternal varicella 5 days or more prior to delivery usually have a benign course, presumably due to passive transfer of maternal antibody across the placenta

  We test for the presence of antibodies against Varisella zoster virus to confirm the existence of adequate protection against the Varisella zoster virus and to detect a recent or past infection. It is also used to identify those who have never been exposed to the virus or have not been vaccinated. This test is ordered on all pregnant women and those

planning to become pregnant to verify that they have a sufficient amount (titer) of rubella antibodies to protect them from infection.

- **Toxoplasma**

Toxoplasma is a parasitic disease caused by the protozoan *Toxoplasma gondii*. The parasite infects many animal species and is common among domestic cats. Animals are infected by eating infected meat, by ingestion of feces of a cat that has recently been infected, or by transmission from mother to fetus. Cats are a major reservoir of this infection.

Up to one third of the world's population is estimated to carry a *Toxoplasma* infection. The number of serologically positive individuals in the United States was found to be 10.8%, with average infection among women of childbearing age (15 to 44 years) of 11%.

During the first few weeks, the infection typically causes a mild flu-like illness or no illness. After that, the parasite rarely causes any symptoms in otherwise healthy adults. However, people with a weakened immune system, such as those infected with HIV or pregnant, may become seriously ill and it can occasionally be fatal. The parasite can cause encephalitis (inflammation of the brain), neurologic diseases and affect the heart, liver, and eyes.

We test for the presence of antibodies in the blood against this protozoon.

- **Cytomegalo Virus (CMV)**

It is a member of the herpes virus family and has the characteristic ability to remain latent within the body over long periods.

CMV infections are frequently associated with salivary glands, though they may be found throughout the body. CMV infection can also be life threatening for patients who are immune compromised (e.g. patients with HIV, organ transplant recipients or neonates).

CMV is found throughout all geographic locations and socioeconomic groups, and infects between 50% and 80% of adults in the United States as indicated by the presence of antibodies in much of the general population. Serological prevalence is age-dependent with higher prevalence at older age groups. CMV is also the virus most frequently transmitted to a developing fetus. CMV infection is more widespread in developing countries and in communities with lower socioeconomic status and represents the most significant viral cause of birth defects in industrialized countries.

We test for the presence of antibodies in the blood against CMV.

- **Hepatitis Panel**

  Although hepatitis A virus, hepatitis B virus, and hepatitis C virus have similar names (because they all cause liver inflammation), these are distinctly different viruses both genetically and clinically.

  Hepatitis A (formerly known as *infectious hepatitis*), is an acute infectious disease of the liver caused by hepatitis A virus, which is most commonly transmitted by the fecal-oral route via contaminated food or drinking water. Every year, approximately 10 million people worldwide are infected with the virus. The time between infection and the appearance of the symptoms, (the incubation period), is between two and six weeks and the average incubation period is 28 days.

  In developing countries, and in regions with poor hygiene standards, the incidence of infection with this virus is high and the illness is usually contracted in early childhood. hepatitis A infection causes no clinical signs and symptoms in over 90% of these children and since the infection confers lifelong immunity, the disease is of no special significance to the indigenous population. In Europe, the United States and other industrialized countries, on the other hand, the infection is contracted primarily by susceptible young adults; most of them are infected with the virus during trips to countries with a high incidence of the disease.

  Hepatitis A does not have a chronic stage and does not cause permanent liver damage. Following infection, the immune system makes antibodies against the hepatitis A virus that confer immunity against future infection. The disease can be prevented by vaccination and hepatitis A vaccine has been proved effective in controlling outbreaks worldwide.

  We test for the presence of antibodies in the blood against this virus; presence of antibodies indicates that the individual has immunity against hepatitis A virus.

  Hepatitis B is a viral disease primarily involving the liver, which may be transmitted by contact with infected blood or body fluids. Once infected with the virus, individuals may carry the virus and infect others through exposure to blood, bodily fluids, or at childbirth.

  Hepatitis B virus infection may either be acute (self-limiting) or chronic (longstanding). Persons with self-limiting infection clear the infection spontaneously within weeks to months.

  Children are less likely than adults to clear the infection. More than 95% of people who become infected as adults or older children will stage a full recovery and develop protective immunity to the virus. However, only 5% of newborns that acquire the infection from their mother at birth will clear the infection. This population has a 40% lifetime risk of death from cirrhosis or hepatocellular carcinoma. Of those infected between the age of one to six, 70% will clear the infection.

  A simple blood test is available to screen individuals for the presence of Hepatitis B surface antigen, core antibody and e antigen. If a woman is known to be Hepatitis B

positive, her child should receive special medication at the time of childbirth to prevent infection with the hepatitis B virus.

Hepatitis C

The hepatitis C virus species is classified into six genotypes. Infection with one genotype does not confer immunity against others, and concurrent infection with two strains is possible. Infection is transmitted by contact with infected blood or body fluids. In most of these cases, one of the strains removes the other from the host in a short time. This finding opens the door to replace strains non-responsive to medication with others easier to treat.

Unlike hepatitis A and B, there is currently no vaccine to prevent hepatitis C infection.

We test for the presence of antibodies in the blood against this virus.

- **Human Immunodeficiency Virus (HIV) 1&2 Plus O**

Only certain body fluids—blood, semen (cum), pre-seminal fluid (pre-cum), rectal fluids, vaginal fluids, and breast milk—from a person who has HIV can transmit HIV. These fluids must come in contact with a mucous membrane or damaged tissue or be directly injected into the bloodstream (from a needle or syringe) for transmission to occur. Mucous membranes are found inside the rectum, vagina, penis, and mouth.

In the United States, HIV is spread mainly by

- Having anal or vaginal sex with someone who has HIV without using a condom or taking medicines to prevent or treat HIV.
- Anal sex is the highest-risk sexual behavior. For the HIV-negative partner, receptive anal sex (bottoming) is riskier than insertive anal sex (topping).
- Vaginal sex is the second-highest-risk sexual behavior.
- Sharing needles or syringes, rinse water, or other equipment (works) used to prepare drugs for injection with someone who has HIV. HIV can live in a used needle up to 42 days depending on temperature and other factors.

Less commonly, HIV may be spread

- From mother to child during pregnancy, birth, or breastfeeding. Although the risk can be high if a mother is living with HIV and not taking medicine, recommendations to test all pregnant women for HIV and start HIV treatment immediately have lowered the number of babies who are born with HIV.
- By being stuck with an HIV-contaminated needle or other sharp object. This is a risk mainly for health care workers.
- In extremely rare cases, HIV has been transmitted by
- Oral sex—putting the mouth on the penis (fellatio), vagina (cunnilingus), or anus (rimming). In general, there's little to no risk of getting HIV from oral sex. But transmission of HIV, though extremely rare, is theoretically possible if an HIV-positive man ejaculates in his partner's mouth during oral sex.
- Receiving blood transfusions, blood products, or organ/tissue transplants that are contaminated with HIV. This was more common in the early years of HIV, but now the risk is extremely small because of rigorous testing of the US blood supply and donated organs and tissues.

- Eating food that has been pre-chewed by an HIV-infected person. The contamination occurs when infected blood from a caregiver's mouth mixes with food while chewing. The only known cases are among infants.
- Being bitten by a person with HIV. Each of the very small number of documented cases has involved severe trauma with extensive tissue damage and the presence of blood. There is no risk of transmission if the skin is not broken.
- Contact between broken skin, wounds, or mucous membranes and HIV-infected blood or blood-contaminated body fluids.
- Deep, open-mouth kissing if both partners have sores or bleeding gums and blood from the HIV-positive partner gets into the bloodstream of the HIV-negative partner. HIV is not spread through saliva.

We test for the presence of antibodies in the blood against HIV 1, HIV2 and HIV O.

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