

### VIRAL SEROLOGY

The use of viral serology may be confusing. The following comments may assist you in ordering and interpreting these diagnostic tests. Should you have questions about what to request, contact the Client Services Department at Warde. We will be glad to assist you in determining whether viral culture, viral serology or antigen detection is appropriate in a given situation.

#### Using viral serology to diagnose an acute infection

##### 1. Documenting seroconversion

Antibody production to an agent begins during the acute stage of an infection and continues during convalescence. Serum collected early in an infection will have fewer antibodies than serum collected later.

Example: A patient has symptoms consistent with mumps infection (fever, swollen salivary glands, and headache). Blood is collected on the day the patient is first seen by a physician and a second specimen is collected two weeks later (when symptoms are no longer present). When the lab assays these two samples, specimen 1 has no antibody to mumps and specimen 2 is positive. The serology report supports the diagnosis of “mumps infection”.

Note: The convalescent serum should be obtained **no sooner than 2 weeks** after the acute serum. The two sera should be assayed together by the laboratory.

##### 2. Detecting IgM

The detection of virus specific IgM in a patient with compatible symptoms is supportive evidence of a specific viral infection.

Example: A patient has symptoms of rubella infection (fever, rash, swollen glands, joint pain). The serum is negative for rubella IgG and positive for rubella IgM. This is evidence of acute rubella infection and there is no need to submit additional specimens.

Note: The absence of IgM would not rule out rubella infection since some individuals do not produce detectable levels of IgM. The presence of rubella IgG does **not** support the diagnosis of an acute rubella infection. The presence of IgG during the acute phase is probably evidence of past infection or vaccination.

#### Using viral serology to determine whether or not a patient has ever had an infection

1. The presence of antibody to a virus in a single specimen collected from a patient who does not have symptoms indicates that the patient has, at some time in the past, been infected with that virus.

Example: the presence of mumps antibody in a patient indicates that this person has either had mumps infection or been vaccinated.

2. The presence of IgG antibody to a given virus in a single specimen collected from a patient who does have symptoms does not necessarily indicate that the patient has that viral infection—even if the level of antibody is “high”.

Example: Most adults have antibody to cytomegalovirus (CMV). The presence of anti-CMV in a patient with a mono-like illness does not prove that the illness is caused by CMV.

Using viral serology and antigen detection to “stage” an infection

1. Hepatitis B virus infection

A panel of tests is usually used to diagnose Hepatitis B infection and define the phase of the infection. The panel includes assays for the detection of Hepatitis B antigens (surface: HBsAg and e: HbeAg) and assays for the detection of antibody to several viral antigens: Anti-HBs, Anti-HBe, and Anti-HBc; “c” or core antigen.

<b>Marker</b>	<b>Incubation</b>	<b>Acute Phase</b>	<b>Past Infection</b>	<b>Chronic Infection</b>	<b>Vaccination</b>
<b>HbsAg</b>	+	+	–	+	–
<b>HbeAg</b>	+	+	–	+/-	–
<b>Anti HBc</b>					
<b>IgM</b>	–	+	–	–	–
<b>IgG</b>	–	+	+	+	–
<b>Anti Hbe</b>	–	–	+/-	+/-	–
<b>Anti HBS</b>	–	–	+	–	+

2. Epstein-Barr Virus (EBV) infection

Primary infection with Epstein-Barr virus is usually asymptomatic and most adults have antibody to this virus. In some patients, particularly young adults, primary infection results in infectious mononucleosis (IM) which is characterized by swollen lymph glands, fever, sore throat and fatigue. Approximately 90% of patients with IM will produce heterophile antibodies that can be easily detected with the Monospot test. Some adults and a higher percentage of children do not develop heterophile antibodies. In these cases tests that detect antibody to EBV related antigens provide evidence of an acute or recent infection.

<u>Antibodies</u>	<u>No Past Infection</u>	<u>Acute Infection</u>	<u>Recent Infection</u>	<u>Past Infection</u>
Anti-Viral Capsid Antigen (VCA)	IgM– IgG–	IgM+ IgG+	IgM+/- IgG+	IgM– IgG+
Anti-EB Nuclear Antigen (EBNA)	–	–	+	+
Anti-Early Antigen (EA)	–	+	+/-	–