



Saint Luke's Regional Laboratories Clinical Laboratory Letter



June 2010

Hepatitis B Surface Antibody Result Interpretation

Hepatitis B surface antibody is the immunity conferring antibody that appears after infection with the hepatitis B virus. It is also the only antibody detectable following vaccination for hepatitis B. Both qualitative and quantitative tests are available. Qualitative results are reported as positive or negative. A positive result corresponds to an antibody level greater than 10 mIU/mL, which is indicative of immunity. For most purposes, including screening for previous hepatitis B infection and routine post-vaccination follow-up, the qualitative assay is the test of choice, and is less expensive than the quantitative assay. Testing is performed Monday through Friday and the specimen requirement is one SST tube of blood.

K2 Synthetic Marijuana Not Detected by Drug Screen

K2 is an unregulated mixture of dried herbs that are sprayed with a synthetic cannabinoid-like substance, which is currently legally sold as incense. This product is also known as K2 Spice, Spice, K2 Summit, Genie and Zohai. The Missouri Regional Poison Center has recently reported several adverse reactions in patients between the ages of 14 and 27 years after smoking K2. Signs and symptoms include:

- Tachycardia
- Hypertension
- Anxiety
- Agitation
- Hallucinations
- Pallor
- Numbness and tingling
- Tremors and seizures

This constellation of signs and symptoms may suggest that K2 is contaminated with other unknown chemicals in addition to synthetic cannabinoid. K2 has also been used in combination with other legal and illegal substances. It is important to realize that K2 does not cross-react with tetrahydrocannabinol (THC) and is not detected

by the drug screen performed at Saint Luke's Health System laboratories.

Detection Window for Drugs of Abuse

The laboratory often receives phone calls asking how long a particular drug of abuse can be detected in urine. The detection window for the most common drugs of abuse is summarized below.

Drug	Detection Time
Amphetamine	1 - 3 days occasional use 7 - 10 days chronic use
Methamphetamine	1 - 3 days occasional use 7 - 10 days chronic use
Barbiturates	4 - 6 days
Benzodiazepines	2 - 7 days
Cocaine	2 - 3 days occasional use 4 days chronic use
Fentanyl	1 - 3 days
LSD	1 - 5 days
Marijuana	3 - 5 days occasional use 8 weeks chronic use
Methadone	2 - 3 days
Opiates	2 - 3 days
PCP	7 - 14 days
Propoxyphene	1 - 7 days

Blood Alcohol Conversion

Another question that the laboratory frequently is asked is how to convert the laboratory's alcohol level to the same unit of measure used for a legal blood alcohol. A legal blood alcohol concentration is usually expressed as the percentage of alcohol by weight (i.e. grams of ethanol in 100 mL of blood). Clinical laboratories generally report ethanol concentration in mg per dL of blood. Lab values can be converted to blood alcohol concentration by moving the decimal point three places to the left. For example, 135 mg/dL becomes 0.135% wt/vol. This value is then truncated to two digits, becoming 0.13% wt/vol or 0.13 g/dL.

Blood Culture Collection Tubes

Optimal collection and specimen processing is essential for recovery of bacteria from blood cultures. Saint Luke's Health System utilizes SPS (yellow top) tubes for collection of samples for blood cultures. The volume of blood collected for culture is the single most important variable in recovering microorganisms from patients with bloodstream infections. The recommended volume for each blood culture is 20 mL, therefore 2 SPS tubes should be used for each collection with 10 mL blood drawn per tube. SPS tubes should be transported to the laboratory for transfer to blood culture media as soon as possible. Transport time for SPS tubes must not exceed 4 hours. Effective immediately, SPS tubes received in the laboratory more than 4 hours after draw will not be accepted.

H. flu in Review

Saint Luke's Microbiology has isolated *Haemophilus influenzae* from sterile body site samples of several patients in the last few weeks. *H. influenzae* is a small non-motile gram negative bacillus most commonly found in the upper respiratory tract. Its shape on Gram stain can vary from coccobacilli to filamentous rods. The name *Haemophilus* translates as 'blood-loving' and is derived from the organism's growth requirement for both hemin and NAD (also known as X and V factor) that are acquired from red blood cells. Colonization of the upper respiratory tract with *H. influenzae* occurs in early childhood.

Pathogenic *Haemophilus influenzae* strains are frequently mucoid & encapsulated, and can be typed as one of six serotypes (a-f) based on the polysaccharide capsule. Serious invasive infections in young children due to serotype b have been largely eliminated due to use of conjugate Hib vaccine. Other strains of *H. influenzae*, termed 'nontypeable' due to lack of a polysaccharide capsule, have emerged as major pathogens in recent years. Unlike type b strains, which enter the blood stream, nontypeable strains cause disease by local invasion of mucosal surfaces. Hence, these strains are most frequently associated with conjunctivitis, otitis media, exacerbations of COPD, community-acquired pneumonia and sinusitis. Neonatal and maternal sepsis occur less commonly but have an overall mortality rate of 50%. The causative nontypeable strain of these infections (biotype IV) is also associated with tubo-ovarian abscess and salpingitis. Nontypeable *H. influenzae*

strains are less frequently isolated in other invasive adult infections including bacteremia and meningitis. *Haemophilus influenzae* isolated in Microbiology recently have represented a variety of encapsulated & nontypeable strains.

Overall, approximately 30% of *Haemophilus influenzae* strains produce beta-lactamase, so physicians treating patients empirically should consider using anti-microbials which maintain activity in the presence of this enzyme. All *H. influenzae* reported by Microbiology include a beta-lactamase result, and strains causing invasive infections have full susceptibility testing performed.

Neuromyelitis Optica Autoantibody

Neuromyelitis optica (NMO), also known as Devic's disease and optic-spinal multiple sclerosis, is a severe idiopathic inflammatory demyelinating disease that selectively affects optic nerves and the spinal cord. It typically spares the brain, and generally follows a relapsing course. Within 5 years, 50% of patients lose functional vision in at least 1 eye or are unable to walk independently. In North America, the proportion of nonwhite individuals is higher among patients with NMO than among those with classic multiple sclerosis.

Many patients with NMO are misdiagnosed as having multiple sclerosis. Accurate diagnosis is important because prognosis and treatment for the two diseases differ. NMO typically has a worse outcome than multiple sclerosis due to early and frequent relapses. NMO is treated with immunosuppression while multiple sclerosis is treated with immunomodulation. Plasmapheresis is more beneficial for patients with NMO than for those with multiple sclerosis.

Early diagnosis and treatment are important to reduce the morbidity of NMO. Seropositivity for NMO autoantibody IgG (NMO-IgG) allows early diagnosis (73% sensitive; 91% specific). NMO-IgG is uniformly negative in patients with classical multiple sclerosis. A positive value justifies initiation of early immunosuppressive therapy.

Seropositive patients are much more likely to relapse or progress within 2 years than seronegative patients. Seronegativity does not exclude the diagnosis of NMO. Patients already treated with immunosuppressive therapy may not have detectable antibody.