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Laboratory News

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NEW TEST ANNOUNCEMENT – BONE-SPECIFIC ALKALINE PHOSPHATASE IMMUNOASSAY

Annu Khajuria, PhD, Chemistry 24 Hour Services

As of November 24, 2014, Marshfield Labs made available the direct Bone-specific Alkaline Phosphatase (BAP) immunoassay to Marshfield Clinic system providers.

The BAP assay replaces Bone Isozyme Calculated Alkaline Phosphatase. Bone Isozyme Calculated Alkaline Phosphatase (APBONE) and Alkaline Phosphatase Fractionation (APISO) will no longer be available. Alkaline Phosphatase Fractionation can be ordered as a send out test (Mayo Lab - Test ID: ALKI) required only under certain clinical conditions.

BACKGROUND

Serum total alkaline phosphatase (ALKP) is of interest in the diagnosis of two main groups of conditions: hepatobiliary disease and bone disease associated with increased osteoblastic activity. In adults with normal liver function, approximately 50% of the total alkaline phosphatase activity arises from the liver and 50% from the bone. Total ALKP may be ordered as part of routine laboratory testing when a person has symptoms of a liver or bone disorder.

If ALKP results are increased but it is not clear whether this is due to liver or bone disease, Gamma-glutamyl Transferase is a very good test to differentiate between liver and bone disease when confirmed with BAP. BAP has improved sensitivity and specificity in monitoring and evaluation of bone-specific diseases.

Bone alkaline phosphatase (BAP) is the bone-specific isoform of alkaline phosphatase. A glycoprotein that is found on the surface of osteoblasts, BAP reflects the biosynthetic activity of these

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bone-forming cells. Serum levels of BAP are believed to reflect the metabolic status of osteoblasts. An accurate assessment of bone metabolism is critical for determining the severity of metabolic bone disease and responses to therapy. Measurement of serum levels of BAP has been shown to be useful in evaluating patients with Paget's disease, osteomalacia, primary hyperparathyroidism, renal osteodystrophy, osteoporosis, and metastases to the bone. BAP concentration is high in Paget's disease and osteomalacia.

The BAP assay is not intended as a screening test for osteoporosis and results should be interpreted in light of the total clinical presentation of the patient, including symptoms, clinical history, data from additional tests, and other appropriate information.

Anti-resorptive therapies lower BAP from baseline measurements in Paget's disease, osteomalacia, and osteoporosis. Several studies have shown that anti-resorptive therapies for management of osteoporosis patients should result in at least a 25% decrease in BAP within 3 to 6 months of initiating therapy. BAP also decreases following anti-resorptive therapy in Paget's disease.

METHOD

The assay is a chemiluminescent immunoassay with a monoclonal antibody specific to bone alkaline phosphatase. The assay was evaluated in-house and was deemed acceptable for all required parameters under regulatory requirements. The reference intervals were verified as per manufacturer instructions.

TEST INFORMATION

Test Name: Bone Alkaline Phosphatase
Test Code: BAP
Specimen Type: Preferred specimen: Serum
Fasting: Not required
Performing Lab: Marshfield Center
Test Availability: Test performed Mondays and Thursdays.
Reference Values:

MALE	FEMALE
<2 yrs: 25-221 µg/L 2-9 yrs: 27-148 µg/L 10-13 yrs: 35-169 µg/L 14-17 yrs: 13-111 µg/L Adult: ≤20 µg/L	<2 yrs: 28-187 µg/L 2-9 yrs: 31-152 µg/L 10-13 yrs: 29-177 µg/L 14-17 yrs: 7-41 µg/L Adult Pre-Menopause: ≤14 µg/L Adult Post-Menopause: ≤22 µg/L

QUESTIONS

Test information is available in: Marshfield Labs' Test Reference Manual.
For Clinical & Technical information contact:
Clinical Chemist - 24 Hour Services at 800-222-5835
Or
Bryan Robeson, Technical Manager, Chemistry - 24 Hour Services at 800-222-5835.

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TEST REVISION: CMV DETECTION

Thomas Novicki, PhD, DABMM, Clinical Microbiologist

SUMMARY

Effective December 1, 2014, the CMV Antigenia Assay (test code CMVAG) will be retired. Marshfield Labs will offer the Cytomegalovirus (CMV), PCR Plasma (CMVQUSO) in its place.

BACKGROUND

CMV is a member of the family Herpesviridae. Like all herpes viruses, CMV remains in a latent state after the initial infection. Found worldwide, the seroprevalence of CMV increases with age and has ranged from 40-100% in many studies. Primary infection is common in infants, children, and young adults, where it usually causes no or minimal symptoms. CMV is also transmissible to the fetus in utero, where it can cause congenital defects that range from mild to debilitating. It also mimics Epstein-Barr viral infectious mononucleosis. In otherwise healthy individuals, CMV will usually remain latent for life. However, reactivation with or without clinical manifestations occurs, typically, in the setting of immunosuppression. In the face of high-level immunosuppression as seen for example in allograft hematopoietic stem cell and some forms of solid organ transplantation, new or reactivation disease can be severe and life-threatening.

Detection of CMV virus in peripheral blood has a high correlation with clinical disease. Historically, the CMV antigenemia test has been used to detect CMV-infected peripheral leukocytes through the application of fluorescent antibody staining and microscopy. This test requires a specialized microscope and is labor-intensive; it must be performed to completion within 8 hours. Beginning in the 1990's, clinical virologists at leading transplant centers worldwide began using quantitative PCR (qPCR) techniques (aka 'viral load' tests) to determine the level of CMV viremia in their patients. Similar to what was seen in the past with hepatitis C and HIV, CMV qPCR has steadily gained acceptance as the test of choice for diagnostic and therapeutic decision making.

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Due to the low volume of this test, CMV qPCR will be done at our main reference laboratory, Mayo Medical Laboratories (MML). Like the antigenemia test, CMV qPCR reports will include a qualitative result of Detected or Undetected. In addition, numerical and log IU/mL values will be given. The test used at MML is FDA-cleared and referenced against the WHO international CMV standard. In contrast to the CMV antigemia assay's one day turnaround, the time-to-result for the new test will vary from one to three days, with the longest periods occurring during the weekends.

Because qPCR is more sensitive than antigenemia detection, a single positive qPCR result, particularly if in low concentration, may reflect asymptomatic reactivation or true CMV disease. In general, higher CMV viral loads are associated with tissue-invasive disease and lower levels with asymptomatic infection. Weekly serial monitoring has also been successfully used to preemptively monitor patients at high risk for serious CMV disease. Log changes of more than 0.5 log IU/mL are generally considered to be of biological significance. Patients with suppression of CMV replication (i.e. <137 or <2.1 log IU/mL at days 7, 14 and 21 of treatment) have a better prognosis than do those with ongoing detectable viral levels. A specific log level decrease of viremia that is prognostic of outcome has yet to be determined. Monitoring should not be done at less than weekly intervals due to the biological lag time of response to antiviral therapy.

TEST INFORMATION

Test Name: Cytomegalovirus DNA Detection by PCR
Key Words: CMV by PCR, CMV Quant, CMV Viral Load
Test Code: CMVQUSO
Clinic (Clinical Order Manager): CMV PCR, Plasma (CMVQU)
Hospital (Centricity): CMV PCR, Plasma (CMVQU)
Downtime: Write-In (Form I)
Specimen: 2.5 mL Plasma collected in EDTA Lavender Top Tube.
Spin down and remove plasma from cells within 6 hours of draw.
Minimum: 0.7 mL
Storage: Frozen
Available: Test is set up Monday through Saturday; analytic time of 3 days
Performing Lab: Mayo Medical Laboratories
CPT code: 87497

CONTACTS

Dr. Thomas Novicki, Dr. Thomas Fritsche, 715-221-6300 (ext. 16300)

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LABORATORY UPDATE: SPECIMEN SOURCE CHANGES FOR ROUTINE CULTURE

Thomas Novicki, PhD, DABMM, Clinical Microbiologist

SUMMARY

As of November 18, 2014, the following changes were made to the list of acceptable specimens for routine aerobic culture and susceptibility (C&S) studies:

1. The predictive values and yield of potential pathogens of nasal/nares and throat swab routine cultures are extremely low. We thus will no longer routinely accept nasal or throat swabs unless a specific pathogen is given (e.g. *Neisseria gonorrhoeae*), OR a consult has been obtained with a doctoral microbiologist.
2. Nasopharyngeal (NP) swab collection kits for bacterial specimens are not available in our system. Consequently, swabs labelled as NP specimens will be rejected as these are likely to be nasal/nares specimens.

NOTES

1. Tissues and aspirates from these sites will continue to be accepted for routine C&S.
2. Throat (i.e. deep cough) swabs in ESwab transport medium will be accepted for routine C&S on cystic fibrosis patients. (Order: Culture, Aerobic - Cystic Fibrosis.)
3. True NP and throat swabs in M6 viral transport medium are acceptable for virus, pertussis, *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* studies.
4. If nasal carriage of *Staphylococcus aureus* is suspected, submit a nasal swab in ESwab transport medium and order Culture, Staphylococcus aureus screen for all *S. aureus*, or Culture, Methicillin Resistant Staph. aureus (MRSA) Screen for MRSA only.

CONTACTS

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