UC Health LABORATORY

Lab Update

April 2013 **Laboratory Phone: 585-LABS** Vol. 5 No. 4

In this issue:

LabUpdate is a periodic publication of the Clinical Laboratories of UC Health. By way of this publication, lab users are provided: 1) updated operational information relevant to the practice of laboratory medicine within UC Health facilities, and 2) didactic material generally applicable to laboratory medicine.

LAB UPDATE
University Hospital Clinical Laboratory

If you are interested in the on site availability of a particular test, please contact the Laboratory Client Services Department at 584-0696 or via email to Jenny Ford at jennifer.ford@uchealth.com.

MICROBIOLOGY

Mycology and Mycobacteriology Cultures

As of March 4, 2013, Mycology (Fungus) and Mycobacteriology (AFB) cultures are being performed in the UC Health Microbiology Laboratory.

Fungus cultures, with or without smears, fungal blood cultures, dermatophyte cultures, and yeast cultures will all be performed in-house. The smears that will be performed include India Ink preparations, KOH preparations, and a modified PAS stain. India Ink preparations are not included on fungal cultures of CSF and must be ordered separately.

For mycobacteriology, AFB cultures with smears and AFB blood cultures will be performed, including appropriate concentration of clinical specimens. The primary culture system for acid fast bacilli will be an automated, liquid-based culture medium that is continuously monitored for growth, using technology similar to that used in modern blood culture systems.

Mycology cultures will be set up 7 days a week on first and second shifts, whereas AFB cultures will be processed on first shift M – F. Initially, mycology susceptibility tests will continue to be send-out tests, as will AFB susceptibilities and molecular tests for direct detection of *Mycobacterium tuberculosis*. If you have questions about these services, please call the Microbiology Laboratory at 584-3913 or Dr. Rhodes at 584-3923.

Molecular Detection of Respiratory Viral Infections

Beginning April 1, 2013, the UC Health Microbiology and Molecular Diagnostics Laboratory will perform a comprehensive panel for respiratory viruses based on nucleic acid amplification and target capture. The assay is an FDA-approved multiplexed test, the GenMark eSensor RVP, which detects 14 viral targets: Influenza A, A(H1), A(H3), A(H1N1); Influenza B; RSV A and RSV B; Parainfluenza 1, 2, and 3; Human Rhinovirus; Human Metapneumovirus; Adenovirus B/E and C. The laboratory has validated the RVP on nasopharyngeal (NP) swabs, BAL fluid, and Bronchial washing.

The RVP assay is available in EPIC as LAB4023 or RESPPCR. The test will be set up daily M-F, with results available the following working day.

If you have questions about the test, please call Vicki Steger at 584-6014 or Dr. Rhodes at 584-3923.

CHEMISTRY

High-sensitivity C-reactive Protein

A high-sensitivity CRP (hs-CRP) test may be used by itself, in combination with other cardiac risk markers, or in combination with a lipoprotein-associated phospholipase A2 (Lp-PLA2) test that evaluates vascular inflammation. The hs-CRP test accurately detects low concentrations of CRP to help predict a healthy person's risk of cardiovascular disease (CVD). Hs-CRP is promoted by some as a test for determining a person's risk level for CVD, heart attacks, and strokes. The current thinking is that hs-CRP can play a role in the evaluation process before a person develops one of these health problems.

What is the difference between regular CRP and hs-CRP tests? Both tests measure the same protein in the blood. The hs-CRP test is for apparently healthy people to determine their risk of cardiovascular disease. It

measures CRP in the range from 0.1 to 10 mg/L. The CRP test is ordered to evaluate patients who have signs and symptoms of a serious bacterial infection or patients with signs and symptoms of a serious chronic inflammatory disease (such as rheumatoid arthritis). It measures CRP in the range from 10 to 1000 mg/L.

Hs-CRP usually is ordered as one of several tests in a cardiovascular risk profile, often along with tests for cholesterol and triglycerides, when a person's risk of heart disease is being evaluated. Some experts say that the best way to predict risk is to combine a good marker for inflammation, like hs-CRP, along with the lipid profile. When hs-CRP is evaluated, it may be repeated to confirm that a person has persistent low levels of inflammation.

Relatively high levels of hs-CRP in otherwise healthy individuals have been found to be predictive of an increased risk of a future heart attack, stroke, sudden cardiac death, and/or peripheral arterial disease, even when cholesterol levels are within an acceptable range. People with higher hs-CRP values have the highest risk of cardiovascular disease, and those with lower values have less of a risk. Specifically, individuals who have hs-CRP results at the high end of the normal range have 1.5 to 4 times the risk of having a heart attack as those with hs-CRP values at the low end of the normal range.

The American Heart Association and U.S. Centers for Disease Control and Prevention have defined risk groups as follows:

- Low risk: less than 1.0 mg/L
- Average risk: 1.0 to 3.0 mg/L
- High risk: above 3.0 mg/L

These values are only a part of the total evaluation process for cardiovascular diseases. Additional risk factors to be considered are elevated levels of cholesterol, LDL-C, triglycerides, and glucose. In addition, smoking, high blood pressure (hypertension), and diabetes also increase the risk level.

Calculated Osmolality

The osmolality test is a snapshot of the concentration of solutes present in the blood (serum), urine, or stool by looking at the number of particles per weight (kilogram) of fluid. It is ordered to help evaluate the body's water balance, its ability to produce and concentrate urine, to help investigate low sodium levels (hyponatremia), to detect the presence of toxins such as methanol and ethylene glycol, and to monitor osmotically active drug therapies such as mannitol. It is also ordered to help monitor the effectiveness of treatment for any conditions found.

Measured serum or plasma osmolality is primarily ordered to investigate hyponatremia. Hyponatremia may be due to sodium loss through the urine or due to increased fluid in the bloodstream. Increased fluid may be due to drinking excessive amounts of water, water retention, decreased ability of the kidneys to produce urine, or the presence of osmotically active agents such as glucose, mannitol, and glycine (a chemical used in surgical irrigation fluids).

At UCMC Clinical Laboratory osmolality is measured using freezing-point depression measurement method using the Advanced™ 3900 Osmometer. Detectable range on the instrument is 1-1500 mOsm/kg H2O. Serum normal range is 278-305 mOsm/kg H2O and urine normal range is 50-1200 mOsm/kg H2O.

A calculated osmolality will be reported as part of the following tests:
EP1 and EP1F – Basic Metabolic Panel
KIDNEY and KIDNEYF – Renal Function Panel
METAPNL – Comprehensive Metabolic Panel

Serum or plasma osmolality is calculated as follows:
2 x (Na+) + (Glucose/18) + (BUN/2.8)

Note: Glucose and BUN may be reported in mg/dL (milligrams per deciliter) or mmol/L (millimole per liter). The numbers shown in the equation above are used to convert from mg/dL to mmol/L.

A normal calculated osmolality range is:
275-295 mOsm/kg.

The OG (Osmol Gap) is the difference between the measured osmolality and the calculated osmolality. This calculation compares measured osmolality with measurements of the major solutes. An increase in the osmol gap may represent the presence of an osmotically active substance in the blood.

OG is calculated as follows:

OG = measured serum osmolality − calculated osmolality
A normal osmol gap is < 10 mOsm/kg