



# Saint Luke's Regional Laboratories Clinical Laboratory Letter

May 2013

## New Blood Culture System in May

Saint Luke's Microbiology will implement an updated blood culture system, called VersaTREK, in May. All SLHS hospitals will be converted to new blood culture collection bottles by June 1.

A major change with VersaTREK is that ARD/resin bottles are no longer necessary for patients receiving antimicrobials at the time of culture collection. Resin bottles have been shown to be ineffective against many of the newer antimicrobials. As an alternative to resins, VersaTrek bottles contain a higher volume of enriched media (80 mL instead of 40 mL) resulting in an optimized blood to broth ratio. This ratio essentially dilutes the inhibitory effect of antimicrobials, as well as other interfering substances e.g. white blood cells. At least one blood culture set should be collected prior to therapy, when possible.

For adult patients a single routine blood culture will consist of one aerobic (Redox 1) and one anaerobic (Redox 2) bottle. The volume of blood obtained for each blood culture remains the single most important factor in recovery of organisms. Twenty mL of blood per culture, split between the two bottles is optimal. Collection of two blood culture sets per septic episode (40 mL total) increases organism recovery by >20%. For pediatric patients a single aerobic bottle will be collected. Separate pediatric bottles are unnecessary. Of note, Bactec MycoF lytic bottles should still be utilized for fungal or AFB blood cultures.

Multiple comparisons have shown superiority of VersaTREK for recovery of fastidious bacteria, including *Campylobacter*. The system detects any gas produced or consumed by micro-organism growth, instead of just CO<sub>2</sub> production. To further optimize fastidious organism recovery, yellow SPS tubes will no longer be used for specimen collection. SPS has been shown to inhibit growth of both *Haemophilus* and *Neisseria* & use of these collection tubes is no longer recommended. All

blood cultures should be collected directly into the appropriate bottles.

## Snapshot of Troponin Results

The Acute Cardiac Injury Profile includes drawing a specimen of blood for troponin I measurement at 0, 3 and 6 hours. Recently, the troponin results for 450 patients at Saint Luke's Hospital were reviewed.

- 326 (72%) had negative troponin values on all 3 specimens.
- 101 (22%) had an elevated (0.04 or higher) value on the first specimen at admission.
- 8 (1.8%) had a negative result on the first specimen and a positive result on the second specimen.
- 3 (0.7%) had a negative result on the first and second specimens and a positive result on the 3<sup>rd</sup> specimen.
- 2 (0.4%) had negative results on the first 3 specimens, but became positive twenty four hours after admission.

This sample of patients suggests that it is important to complete the series of three troponin samples.

## Next-generation CT/NG PCR Improves PPV

Molecular testing is the gold standard for two of the most common sexually transmitted diseases in the U.S., due to superior sensitivity and specificity. Saint Luke's Molecular Diagnostics has performed testing for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* (CT/NG) by PCR since January 2000. Although performance characteristics of the original CT/NG assay far exceeded previously available methodology, the positive predictive value was less than ideal in low prevalence populations.

A next-generation assay for CT/NG, performed on the Roche Cobas 4800 system, was recently validated by Saint Luke's Molecular and effective immediately, has replaced the previous Roche assay. The new assay includes additional

amplification targets for both organisms, improving specificity, and greatly enhancing positive predictive value. With a CT prevalence of 5%, the positive and negative predictive values for the new assay are 93.6% and 99.8%, respectively. Similarly, with an NG prevalence of 3%, the positive and negative predictive values are 96.6% and 100%, respectively. In a recently published multi-center evaluation of 4316 samples, the Cobas 4800 assay demonstrated specificity of 99.6% for CT and 99.8% for NG (JCM, July 2012, 2244-2249).

Preferred specimen types are endocervical swab for females and urine for males. Vaginal swab and female urine samples have also been validated for testing. Swab specimens should be submitted in M4RT media (available from SLRL) and transported at room temperature. Urine specimens should consist of the first 10 to 50 mL of the urine stream. Urine should be submitted in a clean container without preservatives, and should be transported at room temperature within 24 hours of collection. Testing is performed Monday through Friday.

### **Follow-up of Laboratory Tests ordered on the Day of Hospital Discharge**

A recent investigation calculated the proportion of laboratory tests that were not reviewed at patient discharge or 2 months after discharge (Arch Intern Med 2012, 172:1347-48). A total of 662,858 laboratory tests were ordered during 6736 inpatient admissions at a 370 bed teaching hospital between February and June 2011. This study discovered that a significant number of laboratory tests were never reviewed.

- 38% of admissions (n=2542) had at least one test not reviewed before discharge
- 3.1% of laboratory tests (n=20,449) were not reviewed before discharge
- 28% of admissions (n=1886) had unreviewed results at two months post-discharge
- 1.5% of tests (n=10,043) had not been reviewed by two months after discharge

Tests ordered on the day of discharge represented only 6.8% of all tests performed but accounted for

47% of the unreviewed results at discharge and 41% at 2 months after discharge.

Review rates were dependent on the amount of time the results were available for review prior to discharge. The rate of missed review was 21.3% for tests ordered on the day of discharge compared to 1.8% of tests ordered on other days. Tests ordered on the day of discharge are more likely to be pending at the time of discharge.

Importantly, 14.7% (n=3014) of unreviewed results at discharge and 10.8% at 2 months after discharge were abnormal. Tests ordered on the day of discharge accounted for 65.5% of all the abnormal results that were missed.

Failure to follow-up laboratory test results after discharge may increase the risk of patients experiencing an adverse event in the transition from hospital to home. As demonstrated in this study, poor test follow-up is disproportionately attributable to tests ordered on the day of patient discharge. Better discharge planning may decrease ordering unnecessary tests on the day of discharge. Discharge protocols should include review of all laboratory test results.

### **Transaminase Levels in Hemochromatosis**

It is commonly believed that patients with hemochromatosis have elevated ALT and AST. A recent sub-study of the Hemochromatosis and Iron Overload Screening Study compared the transaminase levels of 162 C282Y homozygotes and 1367 C282Y non-homozygotes (Hepatology 2012;55:1722). All patients had elevated levels of ferritin, defined as >300 ug/L in men and >200 ug/dL in women, and transferrin saturation, defined as >50% in men and >45% in women.

In both men and women who were C282Y homozygotes, the mean ALT and AST levels were lower than in non-homozygotes. Most C282Y homozygotes had ALT levels <40 IU/L. The investigators suggested that all Caucasian patients with hyperferritinemia should have their hemochromatosis genotype determined, regardless of the level of serum transaminases.

