Saint Luke's Regional Laboratories
# Clinical Laboratory Letter

**July 2009**

## PNA FISH Expansion

Saint Luke's Regional Laboratories' Microbiology has used PNA FISH for earlier identification of staphylococci from blood cultures since January 2009. As explained in the January 2009 Laboratory Letter, the PNA FISH test allows for differentiation of coagulase-negative staphylococci from *Staphylococcus aureus* within a few hours of blood culture positivity. Traditionally, following Gram staining, positive blood cultures must be sub-cultured for an additional day or two before the organism can be identified. Since its inception for Saint Luke's Hospital inpatients, PNA FISH testing has allowed more appropriately targeted anti-microbial therapy, as well as avoidance of unnecessary anti-microbials.

Last year 24,766 blood cultures were performed within Saint Luke's Health System. There were 2330 positive cultures (9.4%) which is comparable to previous years. The majority of positive blood cultures yielded Gram-positive bacteria (72%), followed by Gram-negative bacteria (20%), anaerobic bacteria (5%), and fungus (3%). A breakdown of the most common isolates is as follows:

| Organism | # Isolates (%) |
|---|---|
| Coagulase-negative staphylococci | 719 (31%) |
| S. aureus, methicillin-resistant | 196 (8%) |
| S. aureus, methicillin-sensitive | 208 (9%) |
| E. coli | 199 (9%) |
| Viridans streptococci | 127 |
| Streptococcus pneumoniae | 100 |
| Enterococcus species, non-VRE | 85 |
| Enterococcus, vancomycin-resistant (VRE) | 38 |
| Klebsiella species | 75 |
| Beta-hemolytic streptococci | 52 |
| Pseudomonas aeruginosa | 42 |
| Candida species | 74 |

A new PNA FISH probe is now available that differentiates *E. coli* from *Pseudomonas aeruginosa*. Microbiology will begin using this probe in July, on inpatient blood cultures that are positive for Gram-negative rods. Results are reported as 'positive for E. coli,' 'positive for P. aeruginosa,' or 'gram-negative rod, not E. coli or P. aeruginosa', and are available the same day the blood culture becomes positive. Also, effective immediately, PNA FISH testing will expand to include positive blood cultures from patients at Saint Luke's South as well as Saint Luke's Hospital, with other SLHS hospitals to follow.

## Phlebotomy Center Closing – Peet Center

The Laboratory Patient Service Center on Level 1 of the Peet Center building will be closing at 1230 on July 31st to make way for continued construction. Laboratory and patient care directors have been working together to continue to provide for patients who regularly utilize this Center. Plans have been made for most patients to receive service in Medical Plaza I, Suite 616. Hours of operations will be 6:00 am to 6:00 pm beginning August 3rd. Please contact Kristy Gibson, Laboratory Director, at 932-3171 if you have questions.

## Bone Marrow Biopsies in the Elderly: A Review of Saint Luke's Hospital Cases

An article in the April 2009 Saint Luke's Regional Laboratories Lab Letter discussed a study published by researchers at the University of Iowa that examined the usefulness of performing bone marrow biopsies in patients 85 years or older. As a follow-up to this article, a similar retrospective review of bone marrow biopsy cases in the elderly was conducted at Saint Luke's Hospital. A total of 66 cases from July 30, 2007 to July 15, 2009 were analyzed in patients 80 years or older at the time of biopsy. Indications for biopsy in this age group in order of most common to least common include: one or more cytopenias, follow-up or staging of a known lymphoma or chronic leukemia, suspicion of a plasma cell neoplasm, thrombocytosis or leukocytosis, follow-up of a previously diagnosed myelodysplastic syndrome (MDS) or MDS-transformed acute myelogenous leukemia (AML) and other (Table 1).

Table 1: Bone Marrow Biopsy Indications in 66 Patients ≥80 Years

| Indication | No. (%) | No. (%) with Specific Diagnoses |
|---|---|---|
| Cytopenias (1 or more) | 33 (50) | 10/33 (30) |
| Follow-up/staging of lymphoma/ leukemia | 11 (17) | 3/11 (27) |
| Suspicion of plasma cell neoplasm | 10 (15) | 6/10 (60) |
| Thrombocytosis or leukocytosis | 7 (11) | 3/7 (43) |
| Follow-up of MDS or MDS-transformed AML | 3 (< 1) | 2/3 (67) |
| Other * | 2 (< 1) | 0/2 (0) |

*Other indications were for evaluation of small cell lung carcinoma metastases to the bone marrow and for ruling out polycythemia vera.

Cases that resulted from follow-up or staging of known malignancies were excluded, leaving 52 of 66 bone marrow biopsy cases for analysis. Only 19 (37%) of the remaining 52 cases generated a specific diagnosis (Table 2). Similar to the study published by the University of Iowa researchers, cytopenia, especially anemia, was the least likely to yield a specific diagnosis, even though it was the most common indication for biopsy in the elderly. Specific diagnoses that were established included plasma cell neoplasm (6 cases), MDS (5 cases), acute leukemia (3 cases), lymphoproliferative disorder (3 cases) and myeloproliferative disorder (2 cases).

Table 2: Specific Diagnosis Determined in 19 Cases

| Diagnosis | Number of Cases |
|---|---|
| Plasma Cell Neoplasm | 6 |
| Myelodysplastic Syndrome | 5 |
| Acute Myeloid Leukemia | 3 |
| Lymphoproliferative Disorder | 3 |
| Myeloproliferative Disorder | 2 |

Follow-up information was available for 23 cases and showed that only 3 of 23 patients received disease-modulating therapy. In all three of these cases patients failed to achieve a therapeutic response.

The results of this study are similar to those reported previously by the Iowa researchers and support their conclusion that due to the potential for increased morbidity, the lack of a specific diagnosis in many cases, and the high likelihood for therapeutic failure or drug intolerance, the risks, benefits and indications for performing a bone marrow biopsy in the elderly should be carefully examined.

## Fetal Lung Maturity Update

Saint Luke's Hospital Laboratory uses the TDx FLM II assay to assess lung maturity of the unborn infant. A study from Washington University School of Medicine demonstrated that amniotic fluid contaiminated with blood does not need to be automatically rejected for testing (Clinical Chemisty 2003;49:935-39). The presence of blood did not significantly influence immature, intermediate or mature results. Saint Luke's Hospital laboratory will begin reporting results on bloody specimens. We do not believe it is necessary to send these specimens to a reference laboratory for a Fetal Lung Profile.

## Newborn Screening Panel Change

Effective April 1, The Missouri State Public Health Laboratory stopped testing for T4 on newborns. TSH, alone, will be used to screen for congenital hypothyroidism.

## Myelin Basic Protein Discontinued

Effective June 19, Mayo Medical Laboratories (MML) discontinued testing for myelin basic protein on spinal fluid. From a quality perspective, MML determined that it was no longer possible to obtain satisfactory reagents on a regular basis to meet their standards. Also, recent revisions to the diagnostic criteria for multiple sclerosis include CSF oligoclonal IgG bands and/or increased IgG index, but not myelin basic protein.

## HCV Viral Load Reference Range Change

Effective immediately, the reference range for HCV PCR Quantitative has changed as follows.

| Old reference range | New reference range |
|---|---|
| <20 IU/mL | <50 IU/mL |

The specimen requirement for HCV Quantitative is 4mL of serum or EDTA plasma (minimum 2mL). Specimen must be centrifuged for 18 to 20 minutes and separated from the cells within 6 hours of draw.