



January 2007

## **Pneumococcus Urine Antigen Test Available**

*Streptococcus pneumoniae* is one of the most common causes of community-acquired pneumonia. Conventional microbiologic tests have variable efficacy for detection of *S. pneumoniae* respiratory infections. The sensitivity of blood and sputum cultures can be as low as 30% and 60% respectively. A urine antigen test, similar to the Legionella urine antigen test, is now available for *S. pneumoniae*. This is a rapid immunochromatographic membrane assay which detects cell wall C-polysaccharide that is common to all serotypes of *S. pneumoniae*. The sensitivity of the *S. pneumoniae* urine antigen test is reportedly the highest in adults having pneumonia with bacteremia (87%). Sensitivity is slightly lower with bacteremia only (80-82%), and overall specificity is 95%. Additionally, this test can remain positive in up to 90% of infected patients after one week of antimicrobial therapy. Although urine antigen is moderately sensitive and highly specific in adults, it has limited utility in children, due to high rates of nasopharyngeal colonization with *S. pneumoniae*.

*Streptococcus pneumoniae* urine antigen testing is now available through Saint Luke's Regional Laboratories' Microbiology Department, with same day results available. The specimen requirement is 10 mL urine from a random collection, and testing can be performed on the same specimen submitted for Legionella urine antigen testing.

## **Cytogenetic Studies: The Importance of Clinical Information**

Accurate clinical information and differential diagnosis is critical for appropriate set up and interpretation of cytogenetic studies. Cell culture medium and choice of mitogenic stimulant is dependent on the diagnosis and type of cell to be analyzed. For constitutional abnormalities, phytohemagglutinin is used to stimulate growth of T lymphocytes. For neoplasms, different mitogens are used, such as pokeweed mitogen and lipopolysaccharide for neoplastic B lymphocytes in B-cell CLL/SLL and IL-4 for neoplastic plasma cells

in plasma cell myeloma. The banding resolution and number of cells karyotyped are also based on clinical information. High-resolution banding is used for microdeletion syndromes and 50 cells are analyzed (instead of the usual 20) for suspected Turner syndrome. Fluorescence in-situ hybridization (FISH) probes are used when a specific chromosomal abnormality is suggested by the diagnosis. FISH is the test of choice for chimerism studies following hematopoietic stem cell transplantation when the donor is of the opposite sex. A panel of FISH probes is used in some neoplasms to provide prognostic information.

For constitutional chromosomal studies, essential clinical information includes:

1. Specimen source
2. Suspected clinical diagnosis or syndrome (if not known, specify dysmorphic features and other findings that suggest a constitutional abnormality)

For neoplastic studies, essential clinical information includes:

1. Specimen source
2. Suspected or known diagnosis (The most specific diagnosis should be provided, for example '*mantle cell lymphoma*' instead of '*non-Hodgkin lymphoma*', '*suspected myelodysplasia*' instead of '*anemia*')
3. Suspected or known cytogenetic abnormality
4. Disease status (active, remission, relapse)
5. Hematopoietic stem cell transplantation status and donor sex

Admitting diagnoses and ICD-9 codes are almost never adequate for this purpose and, in fact, often provide misleading information. For example, a recent requisition form had the code 238.7, which includes myelodysplastic syndromes as well as several chronic myeloproliferative disorders, with different cytogenetic correlates. In another instance, a patient's known history of Down syndrome was not provided. This resulted in the initial misinterpretation of bone marrow cytogenetic results as being consistent with a myeloid

neoplasm, since trisomy 21 can be seen as an acquired abnormality in myeloid neoplasms. A review of requisition forms shows that 40% of orders lack required clinical information.

Saint Luke's Regional Laboratories provides cytogenetic and FISH studies in association with its partnership with Children's Mercy Hospital. Ordering physicians should ensure that all required clinical information is provided on the requisition form.

### Low Dose Acetaminophen Linked to Elevated Alanine Aminotransferase Levels

A recent study has linked the use of acetaminophen in recommended doses to elevated alanine aminotransferase (ALT) levels (JAMA 2006;296:87-93). In addition, this study demonstrated that ALT levels remain elevated after acetaminophen use is discontinued and is no longer detectable.

The study was originally designed to investigate the high incidence of elevated ALT levels observed during early development of a combination hydrocodone / acetaminophen product. The researchers were concerned that opioids may contribute to acetaminophen liver toxicity. A new study was devised to determine the effect of these compounds on ALT levels.

In the new study, participants received acetaminophen alone (n = 26), acetaminophen in combination with an opioid (n = 80), or placebo (n = 39). Acetaminophen was administered at the maximum recommended daily dosage of 4 g for an intended treatment duration of 14 days.

For the individuals that received acetaminophen, with or without the additional opioid, 31% to 44% experienced a maximum ALT of more than 3 times the upper limit of normal. None of the individuals receiving placebo experienced a maximum ALT of more than 3 times the upper limit of normal.

Based on these findings, it is recommended that a patient history of recurrent acetaminophen ingestion be conducted when evaluating elevated ALT levels.

### New Chemistry Reference Ranges

All of the hospitals within the Saint Luke's Health System will convert from Vitros to Beckman Coulter

chemistry analyzers by January 31. This conversion will necessitate changing the reference ranges for many analytes, which are summarized below.

Plasma Analyte	Old Range	New Range
Albumin	3.6 - 4.7 g/dL	3.5 - 5.0 g/dL
Alkaline Phosphatase	40-125 IU/L	m: 53-128 IU/L f: 42-98 IU/L
ALT	20 - 60 IU/L	14 - 63 IU/L
Ammonia	10 - 40 umol/L	9-35 umol/L
Amylase	30 - 100 IU/L	36 - 128 U/L
AST	20 - 50 IU/L	15 - 41 IU/L
Bilirubin, D	0.0 - 0.3 mg/dL	0.1 - 0.5 mg/dL
Bilirubin, T	0.0 - 1.1 mg/dL	0.3 - 1.2 mg/dL
BUN	5 - 20 mg/dL	8 - 26 mg/dL
Chloride	98 - 107 mEq/L	101 - 111 mEq/L
CK	30 - 225 IU/L	m: 49 - 397 IU/L F: 38- 234 IU/L
Creatinine	0.5 - 1.5 mg/dL	m: 0.9-1.3 mg/dL F: 0.6- 1.1 mg/dL
Ethanol	0 - 9 mg/dL	0 - 5 mg/dL
GGT	15 - 80 IU/L	5 - 55 IU/L
Lactate	0.7 - 2.3 mEq/L	0.5 - 2.2 mEq/L
LDH	300 - 600 IU/L	5 - 248 IU/L
Lipase	40 - 300 U/L	22 - 51 U/L

Drug	Old Range	New Range
Gentamicin	Tr 0.5-2.0 ug/mL Pk 4.0-8.0 ug/mL	Tr 0.5 - 4.0 ug/mL Pk 5.0-10.0ug/mL
Phenobarbital	20.0-40.0 ug/mL	15.0 - 40.0 ug/mL
Salicylate	0 - 20 mg/dL	0 - 30 mg/dL

CSF Analyte	Old Range	New Range
Glucose	40 - 80 mg/dL	40 - 70 mg/dL
Protein	15 - 60 mg/dL	15 - 45 mg/dL

Urine Analyte	Old Range	New Range
Amylase	0 - 14 IU/h	1 - 17 U/h
BUN	25 - 43 g/24 h	12 - 20 g/24 h
Creatinine	M 1.0 - 2.0 g/24 h Fe 0.6 - 1.5 g/24 h	0.8 - 2.0 g/24 h 0.6 - 1.8 g/24 h
Protein, total	0 - 225 mg/24h	50-150 mg/24h
Sodium	43 - 217 mEq/L	40 - 220 mEq/L