



Saint Luke's Regional Laboratories Clinical Laboratory Letter



March 2007

Fast Virus Cultures Are Now Possible!

Living cells are required to grow viruses in the laboratory. A combination of tube media and shell vials containing specialized live cell lines are classically used for virus cultures. Viruses may require several weeks to grow by traditional methods, which is not optimal for patient care.

Technological advancement has already allowed replacement of many viral cultures by real-time PCR, which has led to improved turn-around-time and sensitivity. PCR is the test of choice for detection of herpes simplex (HSV), varicella zoster (VZV), and cytomegalovirus (CMV) from all sources, and for enterovirus from CSF. This testing is performed in the Molecular Diagnostics section of Saint Luke's Regional Laboratories.

Due to innovations in viral culture media, it is now possible to replace our remaining traditional virus cultures with a new type of enhanced shell vials. According to recent College of American Pathologists' (CAP) proficiency testing results, time to viral detection by the new shell vials is half or less that of traditional methods. For example, respiratory viruses can be detected in as little as 1.5 days, instead of 10 days.

The Virology section of Saint Luke's Regional Laboratories has begun transitioning to the new shell vials, and will soon eliminate traditional tube cultures entirely. There are no changes necessary for specimen collection or ordering of viral cultures. Virus cultures will have a noticeably shorter time to final results, depending on the specimen source. The specimen source should be noted with the culture request, for optimal results.

Saint Luke's Regional Laboratories has performed 1582 virus cultures in the last two years. The following is a summary of viruses isolated by culture:

Virus	# isolated
Herpes simplex (HSV)	47
Cytomegalovirus (CMV)	35
Parainfluenza	24
Influenza A	14
Influenza B	5
Respiratory Syncytial Virus (RSV)	6
Enterovirus	6
Adenovirus	8
Total	145

Missouri Newborn Screening Results for 2006

The Missouri Department of Health expanded its newborn screening panel in July 2005 to include testing fatty acid oxidation, organic acid and amino acid disorders by tandem mass spectrometry in addition to the conventional tests for phenylketonuria, congenital hypothyroidism, congenital adrenal hyperplasia, galactosemia and hemoglobinopathy.

The Missouri State Newborn Screening Laboratory recently published their results for 2006 in which 80,926 Initial Newborn Screens were performed. There were 709 low risk results and 131 moderate and high risk results. The low risk results usually required only a repeat screen because they were only slightly elevated and the infants were not expected to be affected by these disorders. The moderate and high risk results required diagnostic confirmatory testing. Twenty seven of the 131 moderate and high positives were confirmed to be true positives. The positive predictive value (PPV) was 21%, which compares favorably with the national target PPV of 20% or greater. The probability that a Missouri newborn born in 2006 had a disorder detected by tandem mass spectrometry was 1 in 2997. The following table summarizes the number and type of deficiencies detected.

Deficiency	# Cases
Phenylketonuria (PKU)	7
Hyperphenylalanemia	6
Medium-chain acyl-CoA dehydrogenase deficiency (MCAD)	6
Isobutyryl-CoA dehydrogenase deficiency (IBG)	2
Very long -chain acyl-CoA dehydrogenase deficiency (VLCAD)	1
Long-chain hydroxyl acyl-CoA dehydrogenase deficiency (LCHAD)	1
Short-chain acyl-CoA dehydrogenase deficiency (SCAD)	1
Carnitine Uptake Deficiency (CUD)	1
3-methylcrotonyl CoA carboxylase deficiency (3-MCC)	1
Methylmalonic acidemia (MMA)	1

Several of the 104 false positive results had elevated metabolite levels during confirmatory testing that were subsequently shown to be transient.

More information regarding newborn screening disorders is available at:
<http://www.dhss.mo.gov/Lab/Newborn/index.html>

Drugs of Abuse Testing

Drug testing of job applicants and employees is mandated for many federal government agencies and has also been adopted by many other large and small businesses. Each year, Quest Diagnostics publishes the Drug Testing Index, which provides the positive test rates for the most common drugs of abuse. The most recently published index reflects the results of more than 7.3 million workplace drug tests performed in 2005. Because this index is comprised of such a large data set, it most likely reflects trends in the U.S. workforce.

Workforce	2005	2004	2003	2002	2001
Government	2.3%	2.3%	2.5%	2.5%	2.9%
General	4.5%	4.9%	5.0%	4.8%	4.9%
Combined	4.1%	4.5%	4.5%	4.4%	4.6%

The 2005 data indicates that workforce drug use was at the lowest level since the index was first

published in 1988. The combined workforce had a positive rate of 13.6% in 1988. The positive rate for government workers is about half the rate of the general workforce.

The major reason for this encouraging downward trend has been a significant decrease in marijuana positives in the combined workforce. The following table expresses the percentage of positive results for each drug class between the years 2002 and 2005.

Drug Class	2005	2004	2003	2002
Amphetamines	0.48%	0.52%	0.49%	0.34%
Barbiturates	0.25%	0.27%	0.29%	0.30%
Benzodiazepines	0.58%	0.58%	0.60%	0.58%
Cocaine	0.70%	0.72%	0.74%	0.71%
Marijuana	2.54%	2.88%	2.96%	2.98%
Methadone	0.23%	0.21%	0.20%	0.16%
Opiates	0.32%	0.32%	0.34%	0.27%
PCP	0.02%	0.01%	0.03%	0.02%
Propoxyphene	0.57%	0.63%	0.67%	0.73%

Amphetamine abuse, particularly methamphetamine abuse, is currently a major concern. A slight decline was noted between 2004 and 2005. Preliminary review of the first five months of 2006 revealed that amphetamine positives declined to a 3.5 year low among both groups of workers.

The Drug Index also displays overall drug positive rates by zip code. The Kansas City region was in the lowest quintile, indicating 0 – 3% positive rates for the combined workforce.

How to Find the Lab Letter Online

From the Saint Luke's Health System website (www.saintlukeshealthsystem.org), click on "Services" at the top on the page. Next, click on "Laboratory" from the drop down box. The current and archived Lab Letters from 2003 to present are located under "Clinical Laboratory Letters."

Physicians can also access the Lab Letter by clicking on "For Physicians" on the Saint Luke's Health System website. The Lab Letters are located under the section titled "Knowledge Base."