Division of L&GM Laboratory & Genomic Medicine

Newsletter

Washington University in St. Louis School of Medicine

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IN THIS ISSUE

Clinical Faculty

(*Laboratory Directors)

Clinical Chemistry	
Mitch Scott, Ph.D*	362-1503
Ann Gronowski, Ph.D.*	362-0194
Drug Monitoring · Toxicology	
John Turk, M.D., Ph.D.*	362-2602
Serology · Immunology	
Boris Calderon, M.D.*	362-7667
Microbiology	
Carey-Ann Burnham, Ph.D.*	362-1547
Neil Anderson, M.D. *	362-1307
Blood Bank · Transfusion Medicine	
Brenda Grossman, M.D.*	362-6032
Ron Jackups, M.D., Ph.D.*	362-8413
Chang Liu, M.D., Ph.D.*	747-5773
Charles Eby, M.D.*	362-1302
George Despotis, M.D.	362-6586
Hematology · Hemostasis	
John Frater, M.D.*	362-1553
Charles Eby, M.D.*	362-1302
Cytogenomics	
Shashi Kulkarni, Ph.D.*	454-8418
Hussam Al-Kateb, Ph.D.	454-8699
Ina Amarillo, Ph.D.	747-4966
Catherine Cottrell, Ph.D.	362-8386
Yoshiko Mito, Ph.D.	747-4968
Molecular Diagnostics	
Hussam Al-Kateb, Ph.D.*	454-8699
Jackie Payton, M.D., Ph.D.*	362-5935
Histocompatibility	
Thalachallour Mohanakumar, Ph.D.*	362-8463

New Method for *Mycobacterium tuberculosis* Testing in Respiratory Samples

Mycobacterium tuberculosis

Effective March 19, 2014, the BJH Clinical Microbiology Laboratory has implemented the Cepheid Xpert MTB real-time PCR assay for the rapid identification of *Mycobacterium tuberculosis* directly from respiratory specimens, including sputum, tracheal aspirates, and bronchial alveolar lavage specimens. The sensitivity of the Xpert MTB is dependent on the quantity of *M. tuberculosis* in the specimen, which can be approximated based on the acid-fast bacilli (AFB) stain results from the clinical sample. In AFB smear positive respiratory specimens, the sensitivity of this assay is as high as 98%, while the sensitivity is approximately 70% in AFB smear-negative respiratory specimens. Thus, a negative result does not exclude infection with *M. tuberculosis*. The Xpert MTB assay will be performed Monday through Saturday. In most circumstances, same day testing should be available for an AFB smear-positive respiratory specimen. If you have questions regarding this assay, please contact Carey-Ann Burnham, PhD, Medical Director of Clinical Microbiology for BJH at cburnham@path.wustl.edu or Joan Hoppe Bauer, Microbiology Laboratory Manager at 362-1320.

Testosterone Method Change

Effective April 14, 2014 the immunoassay method for testosterone will change. The new method is a second generation assay on the Abbott Architect that has improved low-end analytical sensitivity. The new assay will detect concentrations as low as 5.0 ng/dL. The new reference interval will be:

Males: 240-871 ng/dL
Females: 14-53 ng/dL

If you have questions, please contact Adrain McClellan at 362-5009 or contact the chemistry laboratory medicine resident/fellow at beeper 747-1320, opt. 2.

continued to page 2

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Featured Colleague

Neil Anderson, M.D.

Dr. Anderson joined the Faculty this July as Assistant Director of the Microbiology laboratory. He is certified in AP/CP, having completed both medical school and residency at the Medical College of Wisconsin. During his training he had the opportunity to work in one of the first laboratories in the U.S. to implement MALDI-TOF mass spectrometry for the identification of clinical isolates in the microbiology laboratory. He studied how the technology functioned overall for the identification of the multitude of different organisms. Later he focused on some of the secondary uses of MALDI-TOF, particularly the ability of MALDI-TOF to detect organisms directly from positive blood cultures and the ability of MALDI-TOF to directly detect some forms of antibacterial drug resistance. During Dr. Anderson's clinical microbiology fellowship at Mayo Clinic in Rochester, Minnesota he continued to work with novel testing platforms, which gave him the opportunity to greatly expand his scope of study. He was able to work with assays for the diagnosis of a wide variety of infectious diseases including strongyloidiasis, West Nile virus, RSV, Chlaymdophila pneumoniae, and Chlamydophila psittaci. We welcome Dr. Anderson to the LGM community!

Cortisol Method Change

continued from page 1

Effective April 14, 2014 the immunoassay method for cortisol will change. The new method will be performed using the Abbott Architect assay. The reference interval for cortisol will change. The new reference interval will be:
Morning: 3.7-19.4 ug/dL
Afternoon: Half of morning value

If you have questions, please contact Adrain McClellan at 362-5009 or contact the chemistry laboratory medicine resident/fellow at beeper 747-1320, opt. 2.

Blood Bank Emergency Plasma

The blood bank has recently switched the emergency plasma supply at BJH to group A as part of national effort to reduce the incidence of transfusion-related acute lung injury (TRALI). TRALI is defined as acute lung injury that develops during or within 6 hours of transfusion of blood components. TRALI remains the number one cause of death secondary to transfusion. In the past it has occurred most frequently after receiving a high-volume plasma component from a female donor. Since 2007, blood centers have tried to exclusively make plasma for transfusion from male donors and have achieved this at a success rate of greater than 99%, except for Type AB. AB is the universal plasma donor, yet only 4% of the donor population is this blood type.

Recently, the American Red Cross completed a retrospective study of their TRALI reduction efforts and found an 80% reduction in reported TRALI after instituting all male plasma for transfusion for all blood types except type AB. With further analysis, they noted that there was no reduction of TRALI following AB plasma infusion. In fact, Group AB plasma from female donors accounted for 50% (14/28) of TRALI cases, with an odds ratio of 14.5 (95% CI 6.3-30). With the 14-fold increased risk of TRALI following transfusion of AB plasma, blood collecting organizations are no longer collecting AB plasma from female donors who have ever been pregnant. Since there is an anticipated shortage of AB plasma, we have replaced the AB plasma with A plasma to be used in an emergency situation until the patient's blood type has been identified. This should limit our use of AB plasma in trauma situations and in routine practice while continuing to optimize patient care and inventory management.

Several academic centers (e.g. Mayo Clinic, Virginia Commonwealth University, University of Florida, and Dartmouth), have converted their emergency release plasma to Group A plasma without any reported adverse effects. Researchers at the Mayo Clinic have recently reported their experience in J Trauma Acute Care Surg 2013; 74:69-75. Fourteen percent of their patients received ABO-incompatible plasma; however, there was no difference in mortality or hemolysis in these patients when compared to those receiving only ABO-compatible plasma. For more information, contact Dr. Brenda Grossman at 362-6032 or Dr. Ron Jackups at 362-8413.

Viral PCR Testing in CSF

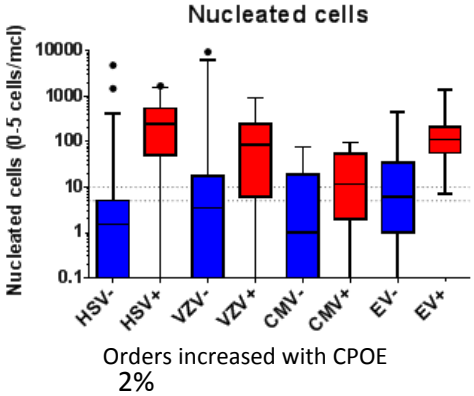
New lab acceptance criteria for viral PCR testing in CSF

Craig Wilen, MD, PhD, Carey-Ann Burnham, PhD, Microbiology Laboratory, 5/21/14

The problem

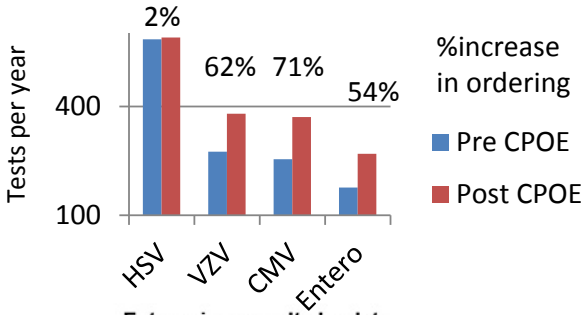
- HSV, VZV, CMV, and enterovirus (EV) are the most commonly ordered CSF PCR tests at BJH.
- From 2008-2013, only 1.3% of nearly 11,000 tests were positive.
- We assessed criteria to reduce unnecessary PCR testing.
- The goal is to reduce false positives, increase the positive predictive value, and optimize use of resources.

CSF PCR Test	# of samples tested (2008-2013)	Positives N (%)
HSV	5,773	65 (1.1%)
VZV	2,073	32 (1.5%)
CMV	1,857	22 (1.2%)
Enterovirus	1,214	21 (1.7%)
Total	**10,917**	**140 (1.3%)**



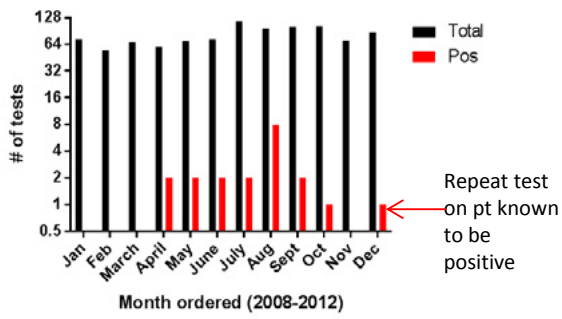
What we found

- We evaluated immune status and CSF parameters including cell counts and differentials, protein, and glucose from all PCR positive patients and a random selection of negative patients.
- A CSF nucleated cell count ≤10 cells/uL was highly predictive of a negative PCR result in immunocompetent patients.
- Test requests increased 50-70% for VZV, CMV, and EV after the implementation of computerized physician order entry (CPOE).
- HSV orders increased only 2% during the same time. This is the only viral PCR test not in the "CSF micro order set."
- EV exhibits seasonal variation. However, ordering patterns at BJH are not seasonal.



What we're doing

- Starting 6/9/14, HSV, VZV, CMV, and EV PCR test requests will only be performed routinely on patients with >10 nucleated cells/uL on the last CSF tube collected or those that are immunosuppressed.



How it affects you

- If the CSF sample does not meet acceptance criteria, a comment will appear indicating that the test has been cancelled.
- If clinical suspicion remains high, please contact the microbiology lab at the number in the Compass comment and testing will be performed.
- Specimens not automatically accepted for testing will be held for 30 days for add on testing as needed.
- For questions, please email Carey-Ann Burnham (cburnham@path.wustl.edu), medical director, or Craig Wilen (cwilen@path.wustl.edu), lab medicine resident, or call the microbiology resident on-call at 747-1320 option 3.

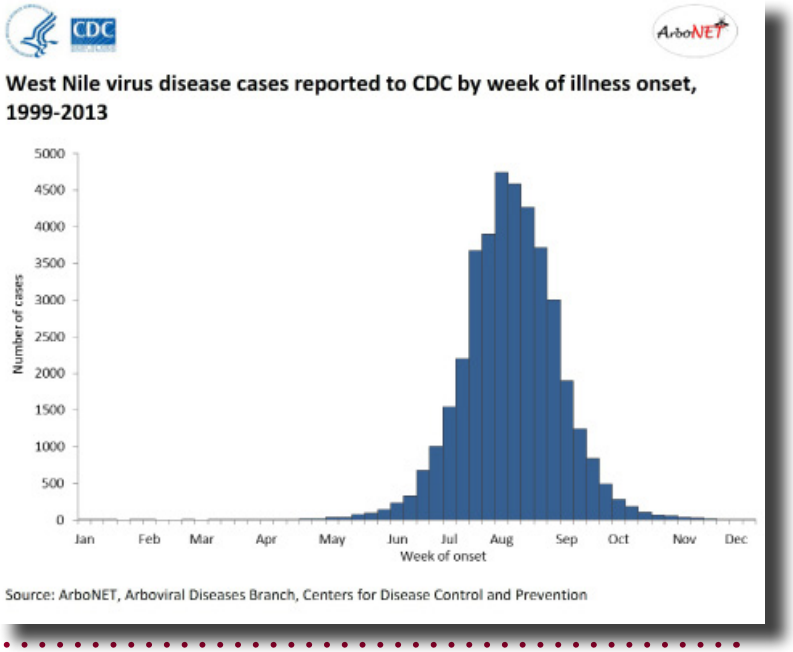
It's Summer -Which means it's Arbovirus Season!

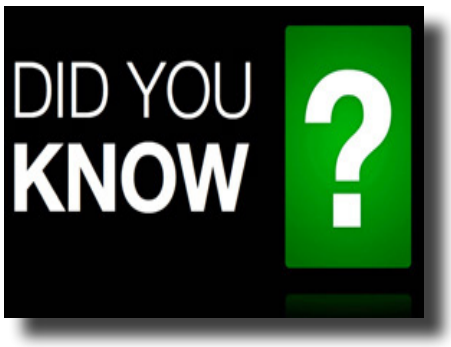
Arboviruses are a group of viruses transmitted to humans by infected mosquitos or ticks. Arbovirus infections typically present with fever, malaise, and headaches. Although rare, disease can also include encephalitis, meningitis, or flaccid paralysis. According to the CDC, in 2012 more than 90% of cases occurred during the months of July to September. Most of the remainder occurred during the months of April to June. Thus, we are entering arbovirus season.

West Nile Virus is the most common arbovirus infection within the United States. Incubation requires 3 to 14 days from exposure and most human infections are not clinically apparent. WNV Serology on CSF is the test of choice for the diagnosis of WNV central nervous system infections. A positive IgM in CSF is suggestive of a recent infection. In contrast, WNV IgM can persist in serum for more than one year in >50% of patients. While reverse transcriptase PCR is an available testing methodology, it is not recommended to diagnose infection because WNV viremia is short-lived and detectable virus is almost always absent by the time a patient presents with symptoms. According to ArboNET, a national arboviral surveillance system managed by CDC and state health departments, over the course of 14 years (1999-2013) 39,557 cases of WNV infection were reported, of which 519 (1.3%) were from Missouri and 2,093(5.3%) were from Illinois. (http://www.cdc.gov/westnile/resources/pdfs/cummulative/99_2013_cummulativeHumanCases.pdf)

An alternative assay, the Arbovirus Panel Serology on CSF includes testing for the following viruses:
(a) California (LaCrosse) Virus,
(b) Eastern Equine Encephalitis (EEE),
(c) St. Louis Encephalitis (SLE), and
(d) Western Equine Encephalitis (WEE).

California (Lacrosse) Virus is most commonly seen in the Midwest and Appalachian states with 90% of infections in children younger than 15 years of age. EEE is seen most frequently in the eastern and Gulf-Coast states. SLE is seen most frequently in the western United States, Texas, the Ohio-Mississippi Valley, and Florida. WEE is almost exclusively seen in the western states and Canadian provinces.





70% of all medical decisions involve clinical laboratory data!

Or so it is claimed by many in the laboratory medicine community (Forsman RW. Clin Chem 1996;42:813-6). This frequently used "factoid" is actually based on an editorial comment in 1996 with ABSOLUTELY no data to support the statement!
So … we would like your input into this.

Please click or copy https://www.surveymonkey.com/s/NHPVHLD and answer two short questions.
We will share our data in a future newsletter.