Division of LGM Laboratory & Genomic Medicine

Barnes-Jewish Hospital BJC HealthCare | Washington University in St. Louis Physicians

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Newsletter

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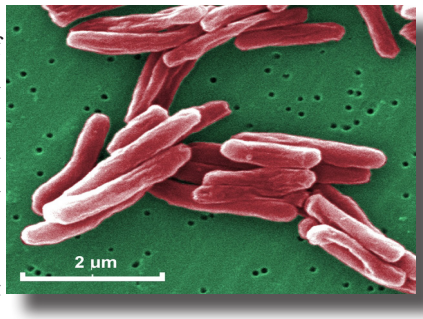
Interferon Gamma Release Assays for Tuberculosis



Interferon-Gamma Release Assays (IGRAs) are whole-blood tests that can aid in the diagnosis of *Mycobacterium tuberculosis* infection by measuring a patient's immune reactivity to *M. tuberculosis*. White blood cells from most persons that have been infected with *M. tuberculosis* will release interferon-gamma (IFN-ɣ) when mixed with antigens derived from M. tuberculosis.

Note that these assays cannot differentiate latent tuberculosis infection from active tuberculosis disease.

There are several advantages to using an IGRA. For example, prior vaccination with BCG (bacille Calmette-Guérin) vaccination does not cause a false-positive result. However, this test is not without its limitations. The assay may be falsely negative even for individuals with active infection or in anergic patients, and false positives can occur in the setting of infection with other Mycobacteria, such as *M. kansasii, M. szulgai and M. marinum*.

At BJH, the "Tspot" (Test Code 76479996) is the available Interferon Gamma Release Assay. This test is orderable in COMPASS and Allscripts. Because this test uses live cells, fresh blood samples in a dark green lithium heparin tube are required and must be analyzed within 36 hours of collection. For this reason, samples can only be collected between the hours of 0600 and 1600 Monday through Friday and must arrive in lab by 1700. All other samples will be rejected. We ask that you keep this in mind when collecting samples for this analysis.

Each month the Chemistry/Hematology laboratories receive, on the average, 75 samples that are confirmed to be contaminated with IV fluid.

The frequency of contaminated samples varies with shift. The Day Shift submits approximately 12%, Evening Shift submits ~30%, and Midnight Shift submits ~58% of all contaminated samples. Each one of these detected contaminated samples delays test results and requires collection of more blood from our patients in addition to the added cost. What can you do to help? Educate your staff. Don't draw blood from an IV line. If an IV line must be used, follow the collection procedure that outlines how long to stop fluids and how to discard blood.

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New Clinical Practice Guidelines for Blood transfusions are introduced as part of a BJC system-wide Patient Blood Management Program

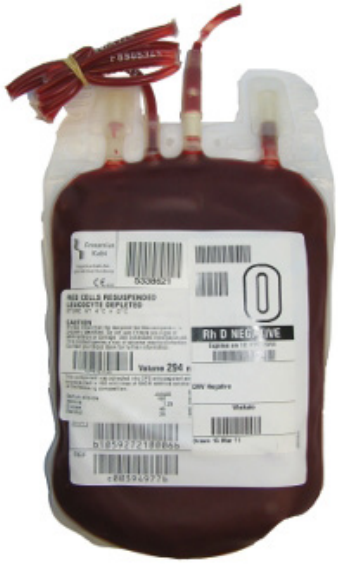
Recently BJH introduced new Red Blood Cell (RBC) transfusion guidelines as part of a BJC system-wide Patient Blood Management (PBM) program. The goal of PBM is to improve patient outcomes by optimizing transfusion practices and reducing the risk of transfusions. Since blood transfusions are one of the most common procedures performed in the hospital, optimizing this therapy is an excellent way to make a positive impact on patient outcomes. In addition to evidence-based guidelines, a successful PBM program will include methods to minimize routine phlebotomy and excessive waste from line draws, identify and manage anemia, and correct reversible coagulopathy prior to invasive procedures.

The BJC RBC Transfusion guidelines are based on recent randomized controlled trials which show that using symptoms and hemoglobin (Hb) thresholds of 7g/dL or 8g/dL in certain hospitalized populations is no less safe than using a higher Hb transfusion threshold. In addition, the guidelines recommend transfusing one RBC unit at a time and then re-evaluating the patient's clinical status prior to further transfusions. Clinicians should always use their clinical judgment by taking the patient's specific clinical information into account. Further recommendations on platelet and plasma transfusion are forthcoming.

Information technology is key to the program's success as a method to educate through clinical decision support (CDS)and monitor physician ordering practices by computer physician order entry (CPOE). On March 24, 2015, COMPASS updated the indications for transfusion to match the BJC guidelines for RBC transfusion (see Table). These will appear within the Type & Cross PRBCs (packed RBCs) order.

A pilot CDS tool has been employed in COMPASS, which will trigger when PRBCs are ordered for a patient with a hemoglobin (Hb) >8 g/dL. This alert is only active on general medicine floors, and will display the patient's most recent Hb along with a message about current best practices, as approved by the BJH Transfusion Committee: "Strong evidence suggests that in hemodynamically stable patients, a hemoglobin threshold of 7-8 g/dL can decrease transfusion exposure without increasing adverse outcomes." The alert will not prevent the order, but will require that the physician provide a reason for transfusion. It is the hope of the BJH Transfusion Committee that this alert will lead to a reduction in unnecessary transfusion by providing vital information to aid the physician at the time of order.

For questions about the transfusion guidelines or clinical decision support tool, please contact Dr. Ronald Jackups, Assistant Medical Director of the BJH Blood Bank, at rjackups@path.wustl.edu.



Inpatient RBC transfusion indications
-Hemorrhagic shock/Life-threatening bleeding
-Active, non-life threatening bleeding and Hb < 8 g/dL
-Preexisting cardiovascular disease or complications and Hb < 8 g/dL
-Hemodynamically stable and Hb < 7 g/dL
-Preoperative Hb < 9 g/dL if life-threatening intraoperative bleeding is expected
-Preoperative Hb < 8 g/dL if life-threatening intraoperative bleeding is not expected
Patients currently exempted from guidelines
-Bone marrow transplant /Bone marrow failure
-Oncology patients
-Sickle cell disease/Congenital anemia
-Blood exchange/Erythrocytapheresis/Chronic transfusion protocol
-Symptomatic anemia (evidence of inadequate oxygen delivery)
-Transfusion according to clinical research protocol

Improvements in Detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae*

Gonorrhea and chlamydia are the two most commonly reported sexually transmitted diseases in the US. The disease burden in Saint Louis is of particular concern following a 2013 surveillance report from the Centers for Disease Control (CDC) ranking the city first in chlamydia and second in gonorrhea rates nationally (http://www.cdc.gov/std/stats13/surv2013-print.pdf).

While many methodologies exist for the diagnosis of gonorrhea and chlamydia, it has been well established that nucleic acid amplification testing (NAAT) has superior sensitivity compared to culture for detecting these pathogens. NAAT testing has readily been available for testing from genital sites and is currently performed at the BJH Microbiology Laboratory. Unfortunately, NAAT testing has not been readily available for extra-genital sites which are increasingly being recognized as important locations for both symptomatic disease and asymptomatic carriage. The 2010 CDC Sexually Transmitted Disease Guidelines recommend rectal and pharyngeal testing of *N. gonorrhoeae* and *C. trachomatis* (GC and CT) for individuals at risk for infection (http://www.cdc.gov/std/treatment/2010/).

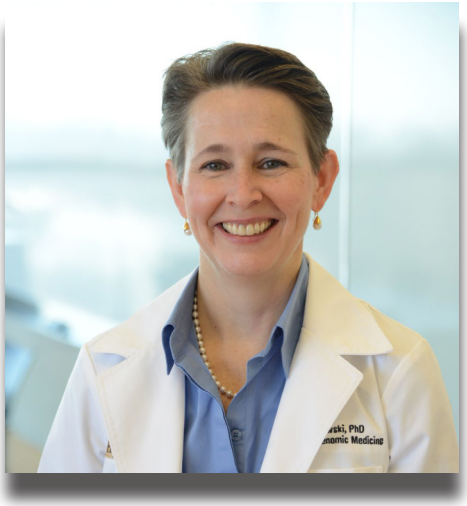
On March 9, 2015 the BJH Microbiology Laboratory began accepting pharyngeal and rectal swabs for NAAT for GC and CT. These specimen types will be accepted in addition to those specimen types that are currently acceptable for GC and CT: endocervical swabs, male urethral swabs, vaginal swabs (special collection kit), and urine (cup specimen). NAAT for GC and CT for the specimen types noted above can be ordered in COMPASS, Allscripts and HMED. Pharyngeal and rectal swab specimens should be collected using the Gen-Probe endocervical swab collection kit.

If you have any questions, please contact Neil Anderson, M.D., Assistant Medical Director of Microbiology (362-1307) or Joan Hoppe-Bauer, Manager of Microbiology (362-1320).

BJH Laboratory Move Update

As previously reported, the BJH Laboratories are moving to the BJH Institute of Health (IOH). Construction of the new Chemistry/Hematology laboratory (shown here) is coming along well. Construction will be completed in May 2015 and the first section to move will be Surgical Pathology.

Featured Colleague



Ann M. Gronowski, Ph.D.

Dr Gronowski received her doctorate from the University of Wisconsin in 1992. She completed postdoctoral training in Clinical Chemistry at WUSM and joined the faculty in 1996. Currently, Gronowski is a Professor in the Departments of Pathology & Immunology and Obstetrics & Gynecology. She is Co-Medical Director of the Clinical Chemistry, and Serology and Immunology laboratories at BJH. In addition to her work at WUSM, Dr. Gronowski is a Past-President of the American Association for Clinical Chemistry (AACC) and currently serves as editor for the clinical case studies feature in the journal Clinical Chemistry. Her research focuses on the laboratory diagnostics of endocrinology and reproductive physiology with an emphasis on maternal fetal medicine. In particular, her laboratory has examined markers of pre-term delivery, markers of fetal lung maturity and the analytical and clinical complexities of measuring hCG. She co-edits "The Pregnancy Lab" (www.pregnancylab.net), a blog dedicated to issues related to laboratory testing during pregnancy. Recently, Gronowski was recognized with the 2015 Distinguished Educator Award for her exceptional work as a clinical fellow mentor. Gronowski has mentored dozens of fellows, many of whom are now national leaders in their field. Gronowski is a tireless advocate for her trainees, leading by example and setting the highest standards for herself in professionalism, clinical service and scholarship. Gronowski emphasizes critical thinking and encourages fellows to apply course material to real-world clinical situations. She continues to mentor trainees after they have left the program, helping many achieve national visibility. Gronowski contributes to the medical center in many other ways, particularly in supporting development of female scientists. At Washington University, Gronowski has established a young women's professional development group called Women in Laboratory Medicine that addresses topics related to career development and work-life balance. She also has been active in the Academic Women's Network (AWN), serving over the years as its pre-clinical counselor, president and liaison to the Executive Committee Faculty Council.

Clostridium difficile testing update: Intervention to Limit Unnecessary Repeat Analysis

Clostridium difficile is the most common cause of antibiotic-associated diarrhea, and *C. difficile* infection (CDI) is the most common healthcare associated infection in the US. CDI is a clinical diagnosis supported by laboratory and endoscopic findings. BJH utilizes the Wampole/TechLab Toxin A/B II enzyme immunoassay which has a negative predictive value (NPV) for CDI of 97.4-99.2%.

Despite the excellent NPV of one *C. difficile* test, at BJH 41% of patients who have an initial negative test have a second test within 7 days of the initial testing, and 53% of patients with a second negative test also have a third test performed. There are no data to support this practice, and repeat testing increases the probability of a false positive result. Repeat testing results in a reduction in the positive predictive value (PPV) of the assay, from ~80% with the first test, to ~20% by the third test. With the frequency of repeat testing at BJH, false positive tests could increase the putative prevalence of "CDI" by 32%.

The consequences of false positive tests, include: unnecessary CDI treatment (which can lead to drug-related adverse events and a paradoxical increased risk for CDI); increased length of stay; infection control implications; and patient harm. Therefore, starting in late May 2015, it will not be possible to order a test for *C. difficile* through COMPASS within 96 hours of an initial negative test. If a repeat test is ordered, a message window will appear stating "*Clostridium difficile* Toxin Alert", and will alert the individual ordering the test to the date and result of the previous assay. If a high index of suspicion for *C. difficile* infection remains after a negative test and a repeat test is clinically indicated, approval for this analysis can be achieved by contacting the Laboratory Medicine Resident on call at 747-1320 ext. 3

LAST CHANCE TO RESPOND!

What Percent of your Medical Decisions are based on Laboratory Testing?

Since July 2014, we have been conducting a survey to determine how many of your medical decisions are based on laboratory testing.

This is your last chance to respond!! Please go to https://www.surveymonkey.com/s/NHPVHLD and answer two short questions. The survey site will close on June 30th.

We will share our final data in the next Lab Medicine newsletter. Thank you!