CPAL Newsletter

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The CPAL Website

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The CPAL Members

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Summit Health
Chambersburg Hospital
Waynesboro Hospital

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Gettysburg Hospital
Good Samaritan Hospital
Ephrata Community Hospital
York Hospital

What's New at CPAL?

In this Issue…

The September issue of the CPAL Newsletter includes an Administrative Update covering some changes with the CPAL Management Team. From Clinical Pathology there is a discussion on CPAL serving as a central send out location for Red Blood Cell (RBC) Genotyping, discussion on changes to the reporting process for Lyme Disease Testing, and an update on Vitamin D 1,25-OH_2 to be available from CPAL as a tandem assay to the already available Vitamin D 25-OH. In the CPAL Corner, there is a new Meet the Staff entry.

Administrative Update

Management Team Changes at CPAL

With the departure of Dr. Wisotzkey in August of 2014 and return to a single Technical Directorship, Dr. Thebo, we determined there was a need for a Molecular Diagnostics Operational Manager to support Dr. Thebo. After posting the position and carrying out numerous applicant reviews and interviews, CPAL selected Susan Aitken, MT(ASCP)MB^{CM} for the position. See more about Susan later on in the Newsletter in CPAL Corner – Meet the Staff.

Clinical Pathology Update

Red Blood Cell (RBC) Genotyping

RBC Genotyping

CPAL has arranged with Grifols to serve as the central send out location for Blood Genotype testing for blood donors and patient samples. Patient samples may be sent through CPAL by any CPAL member hospital; blood donors from York, Lancaster or Pinnacle requiring this testing will have an additional EDTA sent to CPAL that will be directed to blood Genotyping. September 21st will be the first date that CPAL begin to manage samples for blood genotyping.

***Clinical Application* (The chronically transfused patient):** There are numerous clinical applications for blood genotyping. Any disease, either congenital or acquired, that requires frequent RBC transfusions may justify blood genotyping testing as a measure taken to avoid alloimmunization. Patients with the following conditions are the most frequently reported in medical literature regarding red cell antibody formation:

- Sickle Cell Disease (SCD) - RBC transfusions remain an essential component of the medical management of patients with SCD and as a result, alloimmunization increases accordingly. The recent advances in blood group genotyping can be exploited to facilitate the identification of antigen-matched RBCs and improve transfusion support of patients with SCD.

- Thalassemia
- Myelodysplastic Syndromes (MDS)
- Hematologic Malignancies - for patients with hematologic malignancies, the incidence of RBC alloimmunization is estimated at 9 - 15 percent, despite the immunosuppressive effects of the chemotherapy most patients receive. Thus, alloimmunization to RBC antigens in hematology patients is relatively common.
- Myeloproliferative Neoplasms
- Oncology and Renal patients
- Non-invasive fetal RHD genotyping to prevent Hemolytic Disease of the newborn (HDN) -Hemolytic disease of the fetus and newborn (HDN) is caused primarily by feto-maternal RhD incompatibility. Although all RhD negative pregnant women undergo routine antenatal RhD prophylaxis at 28 weeks of gestation, and following delivery if the newborn is RhD positive, HDN has not been eradicated. Non-invasive fetal RHD genotyping during the first trimester of pregnancy can be determined with a high specificity, thus representing a valuable tool for improving the management of RhD negative pregnant women.
- Patients who typically require chronic transfusion support and become alloimmunized require more thorough blood typing to avoid incompatibilities, which can result in life-threatening and costly adverse reactions.

Advantages over serological testing?

Genotyping offers many advantages over serological testing of recipients' blood, with the primary benefit of predicting the blood group phenotype in situations where phenotyping cannot be performed serologically.

- Molecular testing is superior in identifying rare blood and finding better antigen matches for chronically transfused patients.
- Many adverse effects of blood transfusions have been solved or minimized due to molecular typing; blood genotyping facilitates the prevention of alloantibody formation.
- Such testing lays the foundation for a new era of patient-specific transfusion therapy and permits those chronically transfused patients to take advantage of these new advances in cutting edge laboratory medicine.

Conclusion:

Although all blood units are tested for ABO and Rh serologically, frequently transfused individuals require extended blood group antigen testing. Current serologic typing techniques are time-consuming and expensive. Multiple clinical scenarios ranging from SCD to fetal maternal medicine applications are becoming commonplace in healthcare systems throughout the country. Blood group genotyping provides more accurately-typed blood for patients at a fraction of the time it takes to serologically type the donor and patient. Finally, one of the nation's most respected Blood Bank organizations (AABB) strongly supports Blood Genotyping in laboratory medicine for improved patient outcomes for frequently transfused patients along with the creation of appropriate CPT codes for reimbursement.

Lyme's Disease Testing – Change in Reporting Sequence

Borrelia burgdorferi

In August, CPAL's members were notified of a change in the reporting process involving the Lyme Progressive Test – Lyme Antibody Screen with Reflex to Lyme IgG and IgM Western Blots.

CDC currently recommends a two-step process when testing blood for evidence of antibodies against the Lyme disease bacteria. Both steps can be done using the same blood sample.

The first step most frequently uses an immunoassay screening test (most commonly an EIA) designed to detect both IgG and IgM antibodies to *Borrelia burgdorferi*. If this first step is negative, no further testing of the specimen is recommended. If the first step is positive or indeterminate (sometimes called "equivocal"), the second step should be performed. The second step uses an immunoblot test, commonly, a "Western blot" test. Results are considered positive only if the immunoassay (EIA) is positive or equivocal and the immunoblot (Western Blot) is positive.

The two steps of Lyme disease testing are designed to be done together for screen positive or equivocal specimens. CDC does not recommend skipping the first test and just doing the Western blot. Doing so will increase the frequency of false positive results and may lead to misdiagnosis and improper treatment.

In the past, CPAL has reported the Lyme antibody screen results prior to the availability of the immunoblot results. While this is appropriate for samples determined to be negative on the initial screen, as described above, this is not appropriate for samples that are determined to be positive or equivocal on the initial antibody screen. In these cases, based on CDC recommendations, to accurately interpret the antibody screen results, the results of the immunoblot/Western Blot are required.

In light of the CDC recommendations, and to reduce possible confusion related to interpreting Lyme Disease test results, as of August 17th, 2015, CPAL will no longer release a positive or equivocal Lyme antibody screen result before the immunoblot/Western Blot results are available. Although this may appear as 'delaying results', since the algorithm calls for both the immunoassay screen and immunoblot/Western Blot results to be interpreted together on screen positive or equivocal specimens, we find it prudent to hold the screen results until the blot results are available.

Thus, results will flow according to the outcome of the initial antibody screen.

- Initial Lyme Antibody Screen Negative – results will be released as soon as available
- Initial Lyme Antibody Screen Positive – screen results will not be released until the Western Blot results are available
- Initial Lyme Antibody Screen Equivocal – screen results will not be released until the Western Blot results are available

By following this reporting scheme, CPAL feels it can provide the clinician with the most complete information to assess their patient's condition.

We do receive numerous 'Lyme Blot Only' requests with no immunoassay screen. These are not affected by the previous announcement and will continue to be tested and reported as they have been. This only impacts Lyme Progressive orders sent to CPAL where we would perform the Lyme Antibody Screen first and then reflex screen positive or equivocal specimens for Lyme blot testing.

If you have any questions, please feel free to contact CPAL.

New Test Coming to CPAL – 1,25-OH_2 Vitamin D

Vitamin D Testing

Diasorin recently received FDA approval for the first 1,25 $(OH)_2$ Vitamin D immunoassay performed without sample pretreatment. CPAL has received special pricing for the CPAL members (without additional volume obligation) and plans to offer this test in the near future. This will allow both 25-OH Vitamin D and 1,25-$(OH)_2$ Vitamin D to be performed on a single sample using the same analyzer, with the additional benefit to the provider and patient of obtaining the 25-OH Vitamin D test result from the same method, instrument, and lab each time the patient is tested.

Currently, if 1,25-$(OH)_2$ Vitamin D testing is ordered, members send the sample to Quest Diagnostics. Consequently, if it is ordered as part of a group test along with 25-OH Vitamin D and both tests are performed by Quest Diagnostics, the provider may need to interpret the result from two different methods, instruments, and labs that could produce results that vary significantly.

Vitamin D is derived from two sources—from dietary sources and through biosynthesis in the skin. Hydroxylation of vitamin D in the liver produces 25-hydroxyvitamin D (25-OH Vitamin D). 1,25-dihydroxyvitamin D (1,25-$(OH)_2$ Vitamin D) is derived by additional hydroxylation of 25-OH Vitamin D in the kidneys, a process which is controlled by parathyroid hormone (PTH). This bioactive form of vitamin D stimulates absorption of calcium in the intestines—a process regulated by calcium, phosphorous, and PTH. Measurement of 25-OH Vitamin D (half-life 2-3 weeks) is the best practice for assessment of the body's vitamin D stores, as it is much more stable than 1,25-$(OH)_2$ Vitamin D (half-life 4-6 hours). Note that 1,25-$(OH)_2$ Vitamin D is not a good indicator of nutritional status or toxicity. However, in patients with clinical evidence of vitamin D deficiency but with sufficient 25-OH Vitamin D (especially patients with renal disease), a second level of testing by assessment of 1,25-$(OH)_2$ Vitamin D may be indicated. Measurement may also be useful in the differential evaluation of hypercalcemia, sarcoidosis, tuberculosis, and other granulomatous diseases.

Vitamin D assay results can vary significantly between labs, methods, and testing systems, as evidenced by proficiency testing results. Even laboratories using the same method can show significant variability, especially those using laboratory developed tests such as mass spectrometry. This can result in

For the Funny Bone

"Are you sure you hooked him up to the right tank, Miss Brunswick?"

Did You Know?

CPAL is non-profit, non-competing, non-commercial laboratory whose sole purpose is to perform overflow and specialized testing for its members.

Wise Thoughts

A smart man makes a mistake, learns from it, and never makes that mistake again. But a wise man finds a smart man and learns from him how to avoid the mistake altogether.

Roy H. Williams

confusing tests results if the patient is tested by different methods, instruments, or labs. For this reason the CDC has recommended that all Vitamin D assays be standardized to a single reference material. CPAL performs 25-OH Vitamin D testing using the Diasorin Liaison XL. The assay has been standardized as recommended by the CDC, and performs well versus the reference method on both DQAS and CAP proficiency challenges.

Winter WE, Sokoll SI and Jialal I. Handbook of Diagnostic Endocrinology, 2nd Ed. Washington DC: AACC Press; 2008:235-251.

Dietzen DJ, Bennett MJ, and Wong ECC. Biochemical and Molecular Basis of Pediatric Disease, 4th Ed. Washington DC: AACC Press; 2010:196-208.

Endres DB and Rude RK. " Mineral and Bone Metabolism," Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 4th Ed. Philadelphia, AP: Elsevier Saunders; 1920-1943.

LIAISON XL 1,25 Dihydroxyvitamin D Package Insert. Stillwater, MN: DiaSorin Inc. 2015.

CPAL Corner

Meet the CPAL Staff

The next employee to introduce you to is the newest of CPAL's Operations Managers, **Susan Aitken**. Susan comes to CPAL by way of Eurofins Medinet of Lancaster - Eurofins Scientific is a life sciences company operating internationally to provide a comprehensive range of analytical testing services to clients from a wide range of industries including the pharmaceutical, food and environmental sector. Prior to joining Eurofins, Susan spent time in the Virology Laboratory at Penn State Hershey and at the Children's Hospital of Philadelphia. As one of CPAL's two Molecular Operations Managers, Susan has responsibility for CPAL's Molecular Diagnostics (CT/NG, HPV, HIV and HCV Viral Loads, HCV Genotyping, HSV, VZV and Bordetella PCR, Microbial Identifications by Sequencing) and Molecular Oncology Testing (KRAS, BRAF, EGFR, JAK2, and MPL515). Susan obtained her BS degree in Medical Technology from Bloomsburg University and completed her medical technologist studies at the Lancaster General Hospital School of Medical Technology. Susan has also obtained a Molecular Diagnostics Certificate from Michigan State University and earned a specialty in Molecular Biology (MB) from the ASCP. In her time away from CPAL, Susan enjoys spending time with her family and friends. She enjoys live theater, gardening, board and card games as well as water sports.

Have you been to the CPAL laboratory?

The CPAL laboratory is located just off of route 83 in York county. Easy to get to! If you have not been to CPAL or it has been a while, give us a call and arrange for a tour of the lab. We would be happy to show you around!

Contact information

When calling the laboratory, call **717-851-1416**. We will direct your call to the appropriate person. If you know the number of the person you need to speak with, feel free to call them directly. We love to hear from you!