Scientific discoveries have impacted the practice of modern medicine by providing improved methods for the diagnosis of an ever-increasing number of human diseases. Molecular tests are now available to diagnose cancers, metabolic disorders, inherited genetic diseases, as well as many other medical conditions. The specialty of infectious diseases has been favorably impacted by the availability of these technologic innovations as many traditional, time-dependent cultural methods have been replaced by rapid and more sensitive molecular assays. Gene amplification assays, such as the polymerase chain reaction (PCR), have proven to be more sensitive than conventional cultural methods while also providing a much shorter time to final result. In some cases, these molecular technologies have allowed for the detection of microbial pathogens in clinical specimens that could not be diagnosed using conventional cultural methods.

This article, the first in a two-part series that will continue in the fall issue of LabLines, provides a brief overview of some of the molecular technologies that are routinely used in Laboratory Alliance’s Microbiology Department. Mention will also be made as to how these assays have favorably impacted patient care and antibiotic stewardship programs have also benefited while significantly reducing hospital costs. In addition, the use of these technologies has impacted the practice of infection control by allowing for the rapid detection and immediate isolation of patients with hospital-acquired infections resulting in a reduction in the incidence of nosocomial disease transmission.

Septicemia

Septicemia or sepsis is defined as the presence of microorganisms in a patient’s blood and represents a life-threatening medical emergency. Bacteria are, by far, the most common cause of septicemia. Rapid identification of the bacterium responsible for the disease and determining its resistance or susceptibility to an antibiotic are of paramount importance as delays in the administration of appropriate antimicrobial therapy can prolong hospital stays and adversely affect patient outcomes.

Conventional cultural identification and antimicrobial susceptibility test methods may take two to three days before a final report is available for physician review. Laboratory Alliance has replaced these conventional methods with a gene amplification-microarray technology that allows for the rapid identification of the bacteria that are most commonly responsible for septicemia as well as screening for genetic markers that are responsible for methicillin resistance in Staphylococcus aureus (MRSA), and vancomycin resistance in enterococci (VRE).

This same assay also detects resistance markers associated with the production of certain extended-spectrum beta-lactamases (ESBLs) and carbapenemases (CREs) that may be produced by various gram-negative bacteria. These molecular results are available in 2.5 hours and their continuous 24-hour/day availability serves to guide the physician in making appropriate therapeutic choices. Studies have shown that this technology resulted in a 26-hour reduction in time to the administration of targeted therapy, a 1.9 median reduction in length of patient stay and an overall reduction of $7,300 in median hospital costs per patient septic episode.

**Jane Roller, MT(ASCP), is performing a molecular test based upon a nanoparticle technology for the rapid detection of bacteria in a patient’s blood specimen. The assay also detects the presence of certain bacterial antibiotic resistance genes.**

Continued on page 8
Warm Weather Brings Mosquitoes, Ticks and Health Department Warnings

With ticks and mosquitoes being most active between April and September, the Onondaga County Health Department recently issued these warnings for mosquito-borne diseases and Lyme disease, diseases that are confirmed though laboratory tests we run at our main laboratory.

Bites from infected mosquitoes and ticks can spread diseases like West Nile virus, Eastern Equine Encephalitis and Lyme disease.

Lyme Disease
Lyme disease is spread by a bite from an infected deer tick. Not all ticks are infected, but it is important to stay away from ticks. The poster below outlines how to protect yourself from tick bites. If you find a tick on your body, remove it immediately. The Health Department recommends that if you had a tick bite and develop any of these symptoms to call your health care provider:

- A skin rash known as “bulls eye” is commonly seen on thighs, groin, trunk, and armpits. It appears from 3-30 days with an average of 7 days. Other symptoms may include fever, fatigue, chills, headache, muscle and joint aches, and swollen lymph nodes.
- Serious long-term complications can range from arthritis to facial palsy, headache, meningitis, neuropathy, impaired memory, and heart rhythm irregularities.

Protect Yourself from Lyme Disease:

1. Do not walk through brush and high grasses.
2. Use repellents with DEET or permethrin. Follow the product label instructions.
3. When outdoors, wear long sleeves and pants. Tuck in your shirt and tuck pant legs into boots or socks.
4. Check your body for ticks, especially your neck, armpits, groin, and ankles.
5. Get ticks off using these steps:
   - Take tweezers to tick’s head or mouth, where it enters skin.
   - In a steady motion, pull the tick firmly up, away from skin.
   - Clean the bite with soap and water, rubbing alcohol, or hydrogen peroxide.
   - Keep a record of the date, time, and where you were bitten. Flush the tick down the toilet. Never crush a tick with your fingers.

For more information call 435-3280 or visit www.cdc.gov/lyme/

Mosquito-borne Diseases
“Fight the Bite and protect yourself from mosquito-borne diseases” is the message from the Onondaga County Health Department following the recent discovery of mosquitoes infected with Eastern equine encephalitis (EEE). Residents are urged to take precautions against mosquitoes, including using bug spray. Mosquito bites can spread diseases like EEE and West Nile Virus (WNV). It is spread when an infected mosquito bites a person.

Who is at risk of getting infected with WNV and EEE?
Anyone living in an area where WNV and EEE is present in mosquitoes can get infected.

What is the risk of getting sick?
WNV - Most people who get infected with WNV do not develop symptoms. People over 50 are at a higher risk to get severe illness.
EEE - Adults over age 50 and children younger than 15 are the most at risk of becoming severely ill for infection with EEE.

What are the symptoms?
Signs and symptoms may include:
- Headache
- Body aches
- Vomiting
- Diarrhea
- High fever
- Chills
- Nausea
- Neck stiffness
- Confusion
- Tremors (shaking)
- Seizures
- Muscle weakness
- Coma

Use insect repellent safely
- Always follow the label directions.
- Do NOT let children touch repellents.
- Put a small amount of repellent on your hands and apply it to your child.
- Use just enough repellent to cover exposed skin. Do NOT use repellents containing permethrin directly on your skin. (Note: This is NOT mentioned on the Lyme poster at left)
- Do NOT spray repellent on the skin under your clothing.
- Do NOT spray repellent directly on your face, especially near the eyes or mouth.
- Apply a small amount of repellent near the ears.
- Do NOT use repellent on cuts, wounds or irritated skin.
- Do NOT spray repellent in enclosed areas.
- After returning indoors, wash your treated skin with soap and water.

Talk with your healthcare provider if you have been bitten by a mosquito and have any of these symptoms.
For more information, call 435-3280 or visit these online resources:
www.cdc.gov/westnile • www.cdc.gov/eee
www.ongov.net/health/lyme.html • www.cdc.gov/lyme
www.health.ny.gov/diseases/communicable/lyme/

Sources: Centers for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA) and the Onondaga County Health Department
Congressman John Katko Toured Laboratory Alliance in July

U.S. Rep. John Katko (NY-24) visited Laboratory Alliance’s Corporate Offices and toured the core lab at the Operations Center on July 17. The purpose of his visit was to become familiar with our company, its owners, mission and the people we employ.

Following a meeting at the Corporate Offices with Laboratory Alliance’s CEO and Medical Director Dr. Michael R. O’Leary and Senior Vice President Anne Marie Mullin, Mr. Katko and his District Director Tom Connellan headed to the main laboratory. There, they met briefly with several laboratory directors before taking a tour through the main laboratory led by Operations Center Director Rita Romano.

Dr. Paul A. Granato and Histology Manager John Daucher discussed aspects of microbiology and histology processes, and all were focused on emphasizing the unique structure of our company and how it rivals similarly structured laboratories across the country.

Congressman John M. Katko was elected to represent the 24th Congressional District in the U.S. House of Representatives in November 2014. The 24th Congressional District includes all of Onondaga, Cayuga, and Wayne Counties and a portion of Oswego County.

To read more about Rep. John Katko, visit katko.house.gov. Photos and recaps of his activities can be found on his weekly newsletter, available at katko.house.gov/contact/newsletter.
Sentinel antibiotic susceptibility prevalence studies for groups A and B streptococci are performed at least biannually by the Laboratory Alliance Microbiology Department to monitor the emergence of resistance to select antimicrobial agents, namely penicillin, erythromycin, and clindamycin. Group A and group B streptococcal isolates were recovered from patient specimens from various physician practices and/or area hospitals throughout Onondaga County so that the results would not be biased by geographic location or physician practice specialty. The following highlights the results of these studies.

**Group A streptococcal study results**

From April 10 to May 17, 2015, 50 isolates of group A streptococci (GAS) recovered from adult and pediatric pharyngeal specimens were randomly selected for testing against penicillin, erythromycin, and clindamycin. As expected, all 50 isolates (100%) were susceptible to penicillin but, notably, only 82% of the GAS were susceptible to erythromycin and 86% were susceptible to clindamycin. In the past, this resistance has appeared to correlate with increased use of azithromycin. As there can be cross resistance between macrolides and clindamycin, there may not have been overuse of clindamycin. Since the percent of isolates susceptible is lower than 2014, the prescription use of macrolides may have increased this year compared to the past year.

*Table 1 shows the comparative results of the antibiotic sentinel studies that were performed in 2007, 2009, 2011, 2012, 2013, 2014 and 2015*

<table>
<thead>
<tr>
<th>Year</th>
<th>Penicillin (%)</th>
<th>Erythromycin (%)</th>
<th>Clindamycin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>100</td>
<td>94</td>
<td>98</td>
</tr>
<tr>
<td>2009</td>
<td>100</td>
<td>82</td>
<td>84</td>
</tr>
<tr>
<td>2011</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2012</td>
<td>100</td>
<td>68</td>
<td>72</td>
</tr>
<tr>
<td>2013</td>
<td>100</td>
<td>65</td>
<td>69</td>
</tr>
<tr>
<td>2014</td>
<td>100</td>
<td>84</td>
<td>90</td>
</tr>
<tr>
<td>2015</td>
<td>100</td>
<td>82</td>
<td>86</td>
</tr>
</tbody>
</table>

The 2015 susceptibility patterns for erythromycin and clindamycin represented an increased resistance than was detected for these antibiotics over the last sentinel study period of 2014, which had shown increasing susceptibility to both macrolides and clindamycin as compared to 2012 and 2013.

The results of this limited sentinel study indicate that penicillin continues to be effective therapy for the treatment of GAS pharyngitis in the non-penicillin allergic patient and that erythromycin and clindamycin may be effective alternative therapeutic choices in the penicillin-allergic patient, but only when the results of susceptibility testing are available to verify the effectiveness of these drugs. This antibiotic susceptibility trend will be monitored and tracked by performing periodic sentinel studies.

**Group B streptococcal study results**

A similar antibiotic susceptibility prevalence study was performed on 50 randomly selected group B streptococci (GBS) recovered from vaginal specimens requested for Group B Strep from women of childbearing age over a similar time period.


<table>
<thead>
<tr>
<th>Year</th>
<th>Penicillin (%)</th>
<th>Erythromycin (%)</th>
<th>Clindamycin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>100</td>
<td>46</td>
<td>54</td>
</tr>
<tr>
<td>2009</td>
<td>100</td>
<td>50</td>
<td>64</td>
</tr>
<tr>
<td>2011</td>
<td>100</td>
<td>24</td>
<td>38</td>
</tr>
<tr>
<td>2012</td>
<td>100</td>
<td>32</td>
<td>50</td>
</tr>
<tr>
<td>2013</td>
<td>100</td>
<td>22</td>
<td>45</td>
</tr>
<tr>
<td>2014</td>
<td>100</td>
<td>26</td>
<td>36</td>
</tr>
<tr>
<td>2015</td>
<td>100</td>
<td>46</td>
<td>46</td>
</tr>
</tbody>
</table>

As expected, all GBS isolates were susceptible to penicillin. However, an alarming and continued significant increased resistance to erythromycin and clindamycin was noted with only 46% of the GBS isolates tested susceptible to these respective antibiotics. Although erythromycin and clindamycin are the recommended antibiotics of choice for the treatment of GBS vaginal colonization or infection in the penicillin-allergic patient, this astounding increase in resistance to erythromycin and clindamycin may be due to the increased use of these antibiotics to treat GBS colonized or infected patients who are not penicillin allergic.

If treatment is indicated for GBS, penicillin remains the agent of choice for intrapartum antibiotic prophylaxis in the non-penicillin allergic patient. Ampicillin is an acceptable alternative but penicillin is preferred because it has a narrower spectrum of activity and is less likely to select for bacterial resistance. Importantly, physicians are reminded that confirmed GBS resistance to penicillin has not been reported to date and, as such, antimicrobial susceptibility testing against this agent is not performed.

For penicillin-allergic women at risk for anaphylaxis, cefazolin, clindamycin, and erythromycin are possible therapeutic options as recommended by the Centers for Disease Control. While there is no GBS reported resistance to cefazolin, the results of this sentinel study show that only 46% of the GBS isolates tested were susceptible to erythromycin and clindamycin. Since antimicrobial susceptibility testing is not routinely performed on GBS isolates, physicians may specifically request such testing when considering erythromycin or clindamycin as therapeutic options in the penicillin-allergic patient.
Marijuana is a widely used drug for both recreational and medicinal purposes. Its psychoactive and physiological effects include: heightened mood (or euphoria), relaxation and increased appetite. Marijuana has been used to reduce nausea and vomiting in chemotherapy and AIDS patients, and to treat pain and muscle spasticity. The US FDA states that marijuana is associated with numerous harmful health effects and the lack of regulation regarding production, potency, and quality control poses a considerable risk to users. The FDA, however, has approved the prescription use of a limited number of products that contain pure THC as the active substance.

The most pharmacologically active component of marijuana is delta(9)-tetrahydrocannabinol (THC). The primary metabolite of THC is 11-hydroxy THC. This primary metabolite is further oxidized by liver enzymes to the main secondary metabolite: 11-carboxy-THC. This secondary metabolite is then conjugated to glucose in vivo to form a water soluble glucuronide, which can then be excreted in the urine.

The 11-carboxy-THC and its glucuronide persist in the urine for several days to weeks, and are therefore the target molecules when testing urine. Urine is the most common sample type utilized to test for marijuana use.

The testing of a urine sample for 11-carboxy-THC first involves the testing of that sample using a screening assay such as thin layer chromatography (TLC) or immunoassay. These screening assays are typically inexpensive, easy to perform, and they are suitably sensitive. These screening assays, however, lack specificity and sometimes yield false positive results. Therefore samples testing positive by a screening assay must be confirmed as positive by using a more specific methodology involving mass spectrometry such as Gas Chromatography/Mass Spectrometry (GC/MS).

GC/MS methods, which achieve a high degree of specificity first, involve an extraction procedure to partially purify the target molecule 9-carboxy-THC. Following the extraction step, the 9-carboxy-THC is derivatized in order to improve its gas chromatographic properties. The derivatized sample is then injected into the GC/MS analyzer where the derivatized carboxy-THC is first separated from other contaminating molecules by capillary column gas chromatography; then its presence is confirmed by the highly sensitive and specific mass selective detector (single quadrupole mass spectrometer).

Laboratory Alliance has developed and validated a GC/MS method for in-house confirmatory testing of cannabinoids (9-carboxy-THC) in urine. This method will both confirm the presence of cannabinoids and provide a quantitative measure of the 11-carboxy-THC in the urine sample. We will begin offering this new in-house “gold standard” confirmatory method in the third quarter of 2015.

References
Laboratory Alliance now offers a Fecal Lactoferrin test that screens for the presence of lactoferrin which, when positive, is a reliable indicator for the presence of leukocytes in stool specimens. The Fecal Lactoferrin test replaces the microscopic examination for fecal leukocytes because studies have shown that the lactoferrin test is much more reliable than microscopy in identifying patients with inflammatory versus non-inflammatory bowel disease due to infection or other causes.

Clinical Significance

Diarrheal diseases can be classified into inflammatory and non-inflammatory categories. Non-inflammatory diarrhea include those caused by viruses and certain bacterial pathogens that are generally treated with simple oral hydration. Inflammatory diarrhea, on the other hand, tend to be more serious and may require more extensive testing and/or treatment. Infectious causes of inflammatory diarrhea are due to various enteric pathogens such as *Salmonella*, *Shigella*, *Campylobacter jejuni*, and *Clostridium difficile*.

Non-infectious causes of inflammatory bowel disease include ulcerative colitis and Crohn’s disease, both of which are highly inflammatory and are diagnosed by ruling out infectious agents and other potential causes of bowel inflammation. In all inflammatory bowel infections or diseases, fecal leukocytes are found in large numbers.

Microscopic examination of a stained fecal smear has been used for many years as a diagnostic tool for the detection of intestinal inflammation. The typical procedure requires fresh stool (tested within 1 hour of collection or refrigerated for up to 4 hours). However, the detection of fecal leukocytes by microscopy has several disadvantages: 1) microscopy is not standardized and is dependent upon subjective interpretation; 2) due to the rapid deterioration of leukocytes in feces, specimens must be examined soon after collection; and, 3) some enteric pathogens, such as *C. difficile*, produce toxins that rapidly lyse leukocytes and other cells. As a result, leukocytes may not be detected microscopically even though the patient is experiencing severe bowel inflammation.

The fecal lactoferrin test employs the use of a lateral flow immunochromatographic technology that detects the presence of lactoferrin, a glycoprotein component of granules found in leukocytes. Lactoferrin is very stable and is not degraded by toxins and other fixatives produced by pathogens such as *C. difficile*. As such, unsupervised stool specimens can be stored for up to two weeks before testing making the fecal lactoferrin test much more sensitive than microscopy because it does not require intact fecal leukocytes for test positivity. Despite its advantages over microscopy, the fecal lactoferrin test has two limitations:

1. This test should not be performed on hospitalized patients admitted more than 3 days. Studies have demonstrated that fecal leukocyte/lactoferrin testing does not reliably distinguish infectious from noninfectious gastroenteritis in this patient group and may give misleading results.

2. Human breast milk contains very high levels of lactoferrin and infants whose diet includes breast milk will have a positive fecal lactoferrin test. If intestinal inflammation is suspected in a breastmilk fed infant, the stool should be examined for leukocytes by microscopy.

Test Name*: Fecal Lactoferrin or Lactoferrin, Fecal

Method: Lateral flow enzyme immunoassay

Specimen Requirements: Fecal specimen in clean airtight container with NO preservatives

Unacceptable Specimens: Specimens collected in transport media, have been preserved in 10% formalin or other fixatives

Storage and Transport: Transport at ambient or 2-8°C and stored up to 1 week

Schedule of Testing: DAILY

CPT CODE: 83630

Billing Code: 4010505

For questions or concerns regarding this test, please contact me at 315-410-7048.

References:

Urine Drug Screens for Oxycodone, Buprenorphine Added to Menu

By Cheryl Haskins, MS, MT(ASCP)SC, Chemistry and Referral Testing Manager

Effective in June, Laboratory Alliance added the screening assays for oxycodone and buprenorphine in urine to our in-house urine toxicology menu.

Each of these assays are available in two configurations: screening assay only, or screening with reflex to quantitative confirmatory assay if positive. Please note that these assays are separate requests from our urine drugs of abuse assays.

Oxycodone is a synthetic opioid compound, which is commonly prescribed for pain management and has become a frequently abused drug. Although structurally very similar to naturally occurring opiates, oxycodone and its metabolites are not sufficiently detected by our automated opiate drug screen to trip a positive result except when very high levels are present. Therefore, the separate oxycodone screen (which also may detect the metabolite oxymorphone) complements our existing menu, providing better coverage of the opiate and opioid narcotic drug classes.

Buprenorphine is used to treat dependence/addiction to narcotics (opioids). Buprenorphine alone (e.g. Subutex®) and the combination of buprenorphine and naloxone (e.g. Suboxone®) prevent withdrawal symptoms when someone stops taking opioid drugs by producing similar effects to these drugs. Buprenorphine belongs to a class of drugs called mixed narcotic agonist-antagonists. It is prescribed as part of a complete treatment program for drug abuse (such as compliance monitoring, counseling, behavioral contract, lifestyle changes), but like oxycodone, may also be abused. Buprenorphine is not currently detected by any of the assays in our existing in-house menu.

For more information regarding these tests, contact me at 315-410-7014 or by email to cherylhaskins@lacny.com.

---

**Oxycodone**

<table>
<thead>
<tr>
<th>Test Name*:</th>
<th>OXYCODONE SCREEN UR</th>
<th>BUPRENORPH SCREEN UR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Code:</td>
<td>UOXY</td>
<td>UBUP</td>
</tr>
<tr>
<td>Cutoff:</td>
<td>100 ng/mL</td>
<td>10 ng/mL</td>
</tr>
<tr>
<td>Test Description:</td>
<td>Rapid, qualitative immunochromatographic assay. Reported as positive or negative.</td>
<td>No additional testing is performed; quantitative confirmatory testing can be added if requested within 72 hours.</td>
</tr>
<tr>
<td>Best used for:</td>
<td>Screening patient for non-prescribed drug use.</td>
<td></td>
</tr>
</tbody>
</table>

**Buprenorphine & Met**

<table>
<thead>
<tr>
<th>Test Name*:</th>
<th>OXYCODONE W RFLX,UR</th>
<th>BUPRENORPH W RFLX,UR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Code:</td>
<td>UOXYWC</td>
<td>UBUPWC</td>
</tr>
<tr>
<td>Cutoff:</td>
<td>100 ng/mL</td>
<td>10 ng/mL</td>
</tr>
<tr>
<td>Test Description:</td>
<td>Rapid, qualitative immunochromatographic assay. Reported as positive or negative.</td>
<td>If positive, additional testing is performed that will characterize and quantitate individual drugs and metabolites detected.</td>
</tr>
<tr>
<td>Best used for:</td>
<td>Screening and quantitating prescribed drugs.</td>
<td>Please Note: For suspected non-compliance, a direct order for the quantitative assay may be preferred due to lower cutoff levels for positive results.</td>
</tr>
</tbody>
</table>

**Confirmatory Testing***:

<table>
<thead>
<tr>
<th>Test Name:</th>
<th>OPIATES CF RM URINE (Oxycodone cutoff: 20 ng/mL)</th>
<th>BUPRENORPHINE &amp; MET UR (Buprenorphine cutoff: 2 ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detects and quantitates parent drug oxycodone and metabolite oxymorphone, as well as natural opiates and metabolites such as codeine, heroin metabolite (6-AM), hydrocodone and morphine.</td>
<td>Detects and quantitates parent drug buprenorphine and metabolite norbuprenorphine, their glucuronide derivatives and related compound naloxone.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specimen Requirements:</th>
<th>Urine, 1 mL (min. 0.5 mL) 0.5 mL required for screen only</th>
<th>Urine, 3 mL (min. 1.5 mL) 0.5 mL required for screen only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability:</td>
<td>Ambient: 24 hours Refrigerated: 7 days</td>
<td>Ambient: 24 hours Refrigerated: 7 days</td>
</tr>
<tr>
<td>Testing Schedule:</td>
<td>Daily</td>
<td>Daily</td>
</tr>
<tr>
<td>CPT Codes:</td>
<td>80301</td>
<td>80301</td>
</tr>
<tr>
<td>Billing Codes:</td>
<td>1010500 (screen only) 1010501 (screen with reflex)</td>
<td>1010498 (screen only) 1010499 (screen with reflex)</td>
</tr>
</tbody>
</table>

---

* Test names are printed as they appear on the patient report

References:
1. PROFILE V Package Insert, MEDTOX Diagnostics Inc., Burlington, NC 27215 P/N 102038, Rev. 12/09
Improved Patient Care and Reduced Hospital Costs, continued

continued from page 1

Meningitis and Encephalitis

Meningitis is an infection of spinal cord meninges, which can be caused by viruses, bacteria, fungi and protozoa. Viral meningitis, also called aseptic meningitis, is most often caused by an enterovirus (EV) that accounts for 90% of infections. EV meningitis is a relatively benign, self-limiting condition that does not usually require medical intervention, antibiotic therapy, or hospitalization. However, EV meningitis must be distinguished from the far more serious bacterial or septic meningitis which requires immediate medical intervention, the administration of appropriate antibiotics, and hospitalization. As such, patients suspected of having meningitis are hospitalized until the differential diagnosis of EV versus bacterial meningitis can be reliably established.

Conventional methods for the diagnosis of EV and bacterial meningitis typically involve culture which may take two to five days before a final result is available. For several years, Laboratory Alliance has been using a PCR assay for the detection of EV in spinal fluid specimens. The time to final result is 90 minutes and the molecular test is far more sensitive than viral culture. Studies have shown that the use of the EV assay can reduce hospital stays from days to hours, resulting in significantly fewer patient laboratory tests performed, and eliminating the use of unwarranted antimicrobial therapy resulting in a minimum cost savings of $3,000 per patient admission.

Encephalitis

Encephalitis or meningoencephalitis is an infection of the central nervous system most commonly caused by certain groups of viruses. Herpes simplex viruses I and II (HSV-I and HSV-II) are common causes of encephalitis and early diagnosis is essential for the prompt administration of antiviral therapy and a possible favorable patient outcome. Cultural methods are time-consuming, requiring several days, and only detect 5 to 10% of HSV infections. Recently, Laboratory Alliance has offered a gene amplification assay that detects HSV-I and HSV-II in spinal fluids. Final results are available within 90 minutes and the assay has a sensitivity of >95%. The availability of this highly reliable PCR assay eliminates the need for performing an invasive brain biopsy formerly needed for establishing the diagnosis.

Respiratory Infections

Influenza and RSV

Respiratory disease (colds, sore throat, pneumonia, etc.) are the most common infections in humans. Most of these infections are caused by viruses which include influenza and respiratory syncytial virus (RSV). Early diagnosis for these two viral infections is important for the prompt administration of antiviral therapy. For influenza, therapy must be administered within 24 to 48 hours of onset of symptoms to be effective. Conventional viral culture often requires 5 to 21 days to detect the presence of influenza and RSV.

Such time-consuming, labor-intensive cultural methods were superseded by the use of non-cultural EIA technologies. EIA methods provided a short, one hour turn-around time but suffered from having poor sensitivity (60 to 70%).

More recently, gene amplification assays have become available for the rapid and highly reliable detection of influenza and RSV in patient specimens. Patient test results are available in less than one hour of specimen receipt and the test has a sensitivity approaching 100%. This PCR test is performed at each of Laboratory Alliance’s three hospital Rapid Response Laboratories (RRLs) as well as its Operation Center 24 hours per day. As such, this test is performed on emergency room patients as well as outpatients seen by their private physicians. The rapid availability of test results has particular importance for emergency room patients diagnosed with Flu or RSV infection who are hospitalized and require the institution of respiratory infection control measures.

Dozens of Swimsuits Donated

Laboratory Alliance employees donated 48 swimsuits to United Way’s swimsuit campaign that supports the YMCA Urban Swim Initiative to ensure all kids in Syracuse had a swimsuit this summer.

“With eight outdoor public pools in Syracuse, swimming is a great way for children to stay active and healthy throughout the summer,” said Luke Dougherty, director of community impact at United Way, in a news release. “We would like every child to have access to this wonderful recreation opportunity and learn how to enjoy it safely.”

Local businesses were invited to host swimsuit drives in their offices in early June. Kids received a safety seminar prior to getting a swimsuit to ensure they know the importance of water safety.

According to United Way, Laboratory Alliance was the ‘top dog of all employers’ throughout Central New York.

Celeste Nelson, MT(ASCP), is shown loading patient specimens onto an instrument that uses PCR technology to detect over 10 different infectious agents, such as M. tuberculosis (the cause of tuberculosis), in less than 90 minutes.
Summer 2015 9

Courier Mike Manfredi again volunteered to drive the Pace Car, donated by Laboratory Alliance for the 36th Green Lake Triathlon, the longest continuous running tri event in the country. Held on June 13, the certified “live strong event” raises money for cancer treatment.

“I have been volunteering for this event for over 10 years,” said Mike. “My buddies at the Syracuse Athletic Club and the YMCA do a very good job organizing this event. My group starts at 6 a.m. parking cars, setting up the first aid tent, relocating the registration tables to the food tent area and setting up the finish line.”

He then drives the pace car before heading back to his last task of cooking and serving the food, concluding around 1 p.m. And he’s already looking forward to next year’s event.

Laura Buehler, MT, performs a gene amplification assay that detects herpes simplex virus I and II as well as varicella zoster virus, the cause of zoster or shingles, in clinical specimens within 70 minutes.

Courier, Car Lead Benefit Triathlon

Group A Strep Pharyngitis

Pharyngitis or sore throat can be caused by many groups of viruses and a few bacteria of which the Group A Streptococcus (GAS), also called Streptococcus pyogenes, is the most important. Throat cultures are performed to determine if GAS is responsible for disease so that appropriate antibiotics can be administered to prevent the patient from developing the serious non-suppurative sequelae of glomerulonephritis or rheumatic heart disease. Traditional throat cultures take 24 to 48 hours before final results are available.

Laboratory Alliance now offers a highly sensitive gene amplification test that can detect the presence of GAS in pharyngeal specimens within 45 minutes of specimen receipt. This assay is performed at each of Laboratory Alliance’s three RRLs and Operations Center, providing for the prompt diagnosis of GAS pharyngeal infections. Importantly, clinical studies have shown that the molecular assay is considerably more sensitive than culture for detecting GAS.

Pertussis

Pertussis or whooping cough is a bacterial infection caused by Bordetella pertussis. Generally thought to cause disease only in infants and young children, Pertussis can present as a mild disease in adults. Standard methods using culture or direct fluorescent microscopy for diagnosis are either very time consuming (three to five days for a culture) or are terribly insensitive (70% for fluorescent microscopy).

Laboratory Alliance has replaced these outdated methods with a molecular assay with results usually available within 24 hours of specimen receipt. The prompt availability of these highly sensitive test results ensures the prompt administration of appropriate antibiotics and thereby reduces the risk of transmission of this highly contagious disease to others who may be susceptible to infection.

Tuberculosis

Tuberculosis (TB), caused by Mycobacterium tuberculosis complex (MTBC), is a bacterial disease of pandemic proportions infecting over two billion people worldwide. TB has become a disease of increasing concern because of the emergence of multi-drug resistant strains of TB (MDR-TB). Traditional methods for the laboratory diagnosis of TB require the use of microscopy and culture. Microscopy is very insensitive whereas culture confirmation of disease may take several weeks to months.

Laboratory Alliance has been using PCR assay to detect MTBC directly in clinical specimens and can also determine the presence of MDR-TB with reported sensitivities of 95 to 99%. The PCR assay can be completed in less than two hours and the rapid availability of positive results has significant impact on the early administration of appropriate anti-TB therapy, reducing the incidence of TB transmission and the institution of infection control practices for hospitalized patients. Studies have shown that use of the PCR assay resulted in an average hospital savings of $2,278 ($1,582 to $4,570) in isolation bed usage per patient admission by eliminating unnecessary use of costly patient isolation rooms.

Part II of this article will be published in the Fall issue of LabLines with a continuing review of the molecular technologies that are routinely used in Laboratory Alliance’s microbiology section for the rapid laboratory diagnosis of infectious diseases.

continued from page 8

Improved Patient Care and Reduced Hospital Costs, continued

continued from page 8

Laura Buehler, MT, performs a gene amplification assay that detects herpes simplex virus I and II as well as varicella zoster virus, the cause of zoster or shingles, in clinical specimens within 70 minutes.
Laboratory Alliance provides hematology services at its core laboratory and at each of the hospital rapid response labs. Here, we introduce our medical technologists working in hematology, the study of blood in health and disease.

Left, at our Operations Center, the Hematology Department includes, from left, front row: Mital Patel, Anne Chamberlain, Liz Madonian and Michelle Botwinick. Back row, left to right: Dawn Doviak, Michelle Kelley-Leonard, Megan Ormsby, Sarah Pluff, Eric Roberts, Irene Kiner and Jennifer Walczyk.

Working at our Rapid Response Laboratory at Crouse Hospital, pictured above, are, front row: Holly Zehr and Nicole Rivanera, and back row, left to right: Sally Riggall, Robin Corlis, Roy Philpot and Brad Bowen.

The photo at the right features our Rapid Response Laboratory hematologists at Upstate University Hospital Community Campus, from left, front row: Van Le and Maureen Conklin, and behind them are Margie Grosick, Marene Ballard and Diana Signore.

Pictured above are our members of the Hematology Department at St. Joseph’s Hospital’s Rapid Response Laboratory. They include, in the front row, from left: Alistair Krempel, Courtney Pomichter and Jaclyn Fehlman. In the back row, left to right, are: Lisa Dennis, Eric Henry, Tiana Della Penna and Dylan Washburn.
Employee Anniversaries

July, 10 Years
Johnathan Daddario
Douglas Trpcevski

August, 10 Years
Abdelkarim Galal

September, 10 Years
Cristina Lenartowicz

August, 5 Years
Deborah Gardiner
Aslihan Gokce
Jeffrey Piscitell

September, 5 Years
Jerry Gavenda
Eric Hayden

September, 15 Years
Therese Conrad
Gabriella Davis
Alan Farmer
Christine Traphagen

New Employees

Please welcome our new employees
At our Corporate Office
Rebecca Burton - Information Systems Technician

At our Operations Center
Megan Cash - Laboratory Office Assistant
Richard Davies - Laboratory Office Assistant
David Dollinger - Transportation Manager
Sarah Hingre - Technical Processing Assistant
Lori LeClair - Medical Technologist
Lazaro Martinez - Technical Processing Assistant
Jessica Shank - Phlebotomist
Alex Somerville - Phlebotomist
Ethan Stallcup - Histology, Technical Assistant
Rose Thompson - Technical Processing Assistant

At our Rapid Response Laboratory
At St. Joseph’s Hospital
Alistair Krempel - Medical Lab Technician
Patrick Langan - Laboratory Office Assistant
Catherine Nonenmacher - Laboratory Office Assistant
Noreen Rix - Administrative Secretary
Dylan Washburn - Medical Lab Technician
Jackie Wickham - Laboratory Office Assistant

At our Rapid Response Laboratory
At Crouse Hospital
Denice Linehan - Medical Technologist
Paige McCanney - Laboratory Office Assistant

In The News

Director of Microbiology Paul A. Granato, Ph.D., recently announced that the following abstracts were accepted as poster presentations at scientific meetings:

“Comparison of the AmpliVue GAS and the Lyra Direct Strep Molecular Assays with Culture for the Direct Detection of Groups A, C and G Streptococci in Pharyngeal Specimens” was presented at the 115th General Meeting of the American Society for Microbiology, held May 30-2 in New Orleans, La. It was coauthored by Dr. Granato and Laboratory Alliance’s Device Trial Specialists Jennifer L. Lillie and Brenda R. Alkins.

“Rapid Detection of Gram-Positive Bacteria and Resistance Determinants Directly from Positive Blood Cultures Using the iCubate iC-GPC Assay” also was presented at the 115th General Meeting of the American Society for Microbiology May 30-June 2 in New Orleans, La. Dr. Granato coauthored this abstract with G.C. Reyman, S. Young, P. Jim, N.A. Ledeboer and B.W. Buchan.

“Comparison of AmpliVue GAS, Lyra Direct Strep and AccuProbe GAS Direct Molecular Assays with Culture for the Direct Detection of Groups A, C and G Streptococci in Pharyngeal Specimens” will be presented at the International Conference on Antimicrobial Agents and Chemotherapy Sept. 17-21 in San Diego, Calif. Dr. Granato coauthored this presentation with Laboratory Alliance’s Device Trial Specialists Jennifer L. Lillie and Brenda R. Alkins and Medical Technologist Ellen Searles.

Also, Dr. Granato contributed to these recently published scientific articles that have resulted from Laboratory Alliance’s participation in various device trials:


“Identification of Gram-Negative Bacteria and Genetic Resistance Determinants from Positive Blood Culture Broths Using the Verigene Gram-Negative Blood Culture Multiplex Micro-Array Based Molecular Assay” was published in the August 2015 issue Journal of Clinical Microbiology. It was accepted May 20, 2015, and was co-authored by Dr. Granato and N.A. Ledeboer, B.K. Lopansri, N. Dhiman, R. Covagnolo and K.C. Carroll.

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Laboratory Alliance is ready to offer challenging and rewarding career opportunities to qualified candidates.

Our team of more than 400 professionals performs over 10.7 million laboratory tests annually. Consider a career with the area’s largest laboratory. A local healthcare company working behind the scenes to provide excellence in laboratory medicine.

Apply online at laboratoryalliance.com/careers
Community Connections

Calendar of Events

Friday, Sept. 11
St. Joseph’s Hospital Health Center 22nd Annual Golf Classic, Turning Stone Resort. Laborantory Alliance is a corporate sponsor.

Saturday, Sept. 12
Laboratory Alliance Company Clambake, The Spinning Wheel Restaurant. Employees should sign up by Wednesday, Sept. 2.

Friday, Sept. 25
September Song to benefit Hospice of CNY, Traditions at the Links. Laborantory Alliance is a corporate sponsor.

Friday, Sept. 25
2015 Tribute Evening to benefit Crouse Hospital Foundation, The Oncenter. Laborantory Alliance is a corporate sponsor.

Wednesday, Oct. 14
“There’s No Place Like Home” event to benefit Francis House, New York State Fairgrounds.

Young Leaders in Central New York Connect, Serve and Learn

Young Leaders United (YLU) is an affinity group of the United Way of Central New York, born from the need to engage millennials into the United Way family.

Nearly a year after its inception, it has 105 members and is growing. YLU members commit to a $250 per year financial donation and they agree to serve 16 volunteer hours each year. In exchange for those commitments, young leaders can take advantage of Leadership Education (fireside chats and lunch & learns with community leaders) and Community Education (tours/presentations from local organizations).

Group and individual volunteer opportunities are made known and members can log their volunteer hours on volunteercny.org.

In addition, there are many social and networking events. One can invest as much or as little time as he or she desires.

The YLU website is being developed, but information is available at www.ylunited.org. Also view the YLU Facebook page at Young Leaders United-United Way of Central New York; there is also an exclusive LinkedIn page and YLU is on Twitter.

After its first year, YLU announces that member contributions, along with a matching grant from the Richard Mather Foundation, have totaled more than $71,000. Money raised through YLU membership and its annual fundraiser goes to the United Way community program allocation fund, which helps to support 91 different programs in 34 different partner agencies.

YLU members have been involved in some wonderful volunteer opportunities, including the Post Standard’s Hope for the Holidays, the Christmas Bureau, the Community Build to End Homelessness with the Rescue Mission, Clean Up ‘Cuse Day and Success By 6 Book Drive.

Several annual social events offer an opportunity to welcome new members, thank volunteers and serve as a networking opportunity for everyone involved.

Consider becoming a member and attend whatever events fit into your schedule, or you may elect to serve on some of YLU committees. Eleven YLU members have “graduated” and currently serve on United Way Committees.

For more information, email Marianne Ferris, United Way’s director of Leadership Development, at mferris@unitedway-cny.org