West Nile Virus Testing Wrap-Up

by Steven Hinrichs M.D., Director, NPHL and Josh Rowland, State Training Coordinator, NPHL

As we are nearing the end of West Nile Virus (WNV) testing here at the Nebraska Public Health Laboratory (NPHL), we can finally reflect on the large volume of testing that was performed. To date, the NPHL tested over 11,000 serum and cerebral spinal fluid specimens for the presence of WNV antibody. The IgM capture ELISA screening test used by NPHL resulted in over 2000 positive results.

The first WNV sample collected for testing at NPHL was June 4, 2003. NPHL reported its first positive on July 1, 2003. The following graph (Figure 1) depicts the volume of positive results per week determined by the NPHL during the WNV season.

The NPHL closely monitors the positive test result rate as a measure of proper test utilization. Our experience over time has shown that positive rates are heavily dependant on disease prevalence. We have also observed that over-utilization of a test will greatly decrease positivity rates. This over-utilization may be driven by patients seeking to know their immune status even if they are asymptomatic. In the absence of a disease outbreak a positive rate of 7% to 10% is typical. The graph illustrates that the positivity rate remained relatively constant throughout the

(Continued on page 2)
Lactoferrin Stool WBC Test

A new commercial test is available that detects the presence of white blood cells in the stool, a finding that is consistent with inflammatory diarrhea. Bacterial inflammatory diarrhea may be caused by Shigella, Salmonella, Campylobacter, and Clostridium difficile. Noninfectious inflammatory diarrhea may be seen in ulcerative colitis and Crohn’s Disease.

The new test improves sensitivity and specificity over tests based on the cytological finding of WBCs in the stool. The new assay detects a glycoprotein component of neutrophilic granules called lactoferrin that is present in leukocytes and is released from fecal leukocytes. Detection is accomplished immunologically by a rapid latex agglutination method.

The new screening test will replace the current microscopic method that uses a gram stain of stool. The improved performance of the latex test over the microscopy test is due to the elimination of the variability in lysis of WBC’s in the stool. The longer WBC’s are exposed to elevated temperatures, the more lysis occurs with fewer intact cells remaining to be seen in cytological preps. Lactoferrin is less sensitive to conditions that support degradation.

Important note: Since lactoferrin is a component of breast milk, the test will be positive in breast fed children and should not be used to evaluate neonates receiving breast milk. However, the test uses a human lactoferrin specific antibody that does not cross react with goat or bovine lactoferrin. Please contact Josh Rowland at jrowland@unmc.edu or 402-559-6070 if you have questions or are interested in setting up the procedure in your laboratory.

Preparing for the Possibility of SARS

The Nebraska Public Health Laboratory (NPHL) has received inquires regarding the handling, transportation and diagnostic testing of clinical (human) specimens for the Severe Acute Respiratory Syndrome (SARS) associated Coronavirus, also known as SARS-CoV.

The NPHL has worked closely with Dr. Anne Mardis and Dr. Thomas Safranek, State Medical Epidemiologists at the Nebraska Health and Human Services System (NHHSS), in the formulation and coordination of a state response plan. A portion of the response plan will entail a laboratory testing strategy or algorithm for NHHSS approved testing. The response plan will be based on guidelines from the Centers for Disease Control and Prevention (CDC), the Council of State and Territorial Epidemiologists (CSTE), and the Association of Public Health Laboratories (APHL). These organizations have put together guidance documentation outlining “alertness levels” for healthcare providers based on international, national, state and local SARS activity. These guidelines are being utilized by the state public health laboratories and state epidemiologists to formulate state-specific SARS response plans. On November 25, 2003, Richard Raymond, M.D., Nebraska’s Chief Medical Officer sent out, through the Nebraska Health Alert Network, details regarding SARS surveillance, case reporting and laboratory testing. Please go to the homepage of www.nphl.org to view this document.

As part of CDC’s Laboratory Response Network (LRN), the NPHL has ability to test respiratory specimens for the presence of SARS-CoV by DNA PCR testing. Additionally, the NPHL can perform SARS-CoV IgM and IgG antibody testing. All specimens should be collected using the recommended Standard Precautions (previously Universal Precautions), and handled in Biosafety Level 2 (BSL-2) laboratory conditions. Additional information about SARS can be found at the CDC’s website (www.cdc.gov/ncidod/sars/).

Prior to collecting or ordering SARS testing, all suspect cases must be approved for SARS-CoV testing by NHHSS officials. Once the approval for SARS testing has been granted, specimens should be properly collected and sent to the NPHL for testing. All potential SARS related cases should be discussed with Dr. Anne Mardis or Dr. Tom Safranek by calling 402-471-2937.

If SARS testing is approved by an NHHSS official, transportation methods other than the usual means may be used to expedite shipment of the specimen. Please contact NPHL Client Services with packaging and shipping questions. For laboratory questions, please contact Tony Sambol at 402-559-3032.

REMINDER

Upcoming training/educational events as well as archived material can be found on nphl.org

1. Go to www.nphl.org
2. Click “TRAINING/EDUCATION” on the blue menu bar
3. You will find, in reverse chronological order, a list of upcoming topics
4. Scroll down to find a list of archived material
**Update: Salmonella serotyping**

*by Beth Schweitzer, MT (ASCP), NPHL and Paul Fey Ph.D., Associate Director, NPHL*

Since the establishment of the National Salmonella Surveillance System in 1962, serotyping of *Salmonella* has become a time-honored tradition within state public health laboratories. Serotyping, along with molecular methods such as pulsed-field gel electrophoresis (PFGE), has allowed epidemiologists to define epidemic patterns, to identify temporal trends in disease transmission, and to monitor control efforts. Currently, over 2400 serotypes have been defined within the two recognized *Salmonella* species: *S. enterica* and *S. bongori*.

A total of 170 isolates were submitted to the Nebraska Public Health Laboratory in 2002. Forty-two different serotypes were identified with serotypes Typhimurium, Heidelberg, Enteritidis, and Newport accounting for more than half (Table 1).

### Top 9 serotypes seen in Nebraska, 2002

<table>
<thead>
<tr>
<th>Serotype</th>
<th>Nebraska</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhimurium</td>
<td>47</td>
<td>85</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>Enteritidis</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Newport</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Kottbus</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Saint Paul</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Muenchen</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Orienburg</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Larochelle</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

The goal of the serotyping program in Nebraska is to enable the NPHL and the Nebraska Health and Human Services System to track and better understand current and historical changes in *Salmonella* serotypes. For instance, *Salmonella* serotyping, in combination with PFGE, has allowed the public health community to track the current national increase in prevalence of multi-drug resistant *S. Newport*. The following is a description and comparison of the total data from Nebraska from 1997 through 2001 as compared to the National *Salmonella* serotype information during the same period.

**Serotype Trends in Nebraska and comparison to National Data:**

Between 1997 and 2001, there were 762 *Salmonella* isolates submitted to the NPHL for serotyping. The most common serotype for each year was *S.* serotype Typhimurium (36%) followed by serotypes Enteritidis (15%), Heidelberg (5%) and Newport (5%). Nationally, *S.* serotype Typhimurium constituted 27% of all isolates over the same time period. The incidence of *S.* Typhimurium (Figure 1) from 1997 to 2001 decreased in Nebraska over this same time frame from a high of 59% in 1997 to 33% in 2001.

Serotype Enteritidis (Figure 2) was seen at higher rates in the United States than in Nebraska over the five year comparison. However, the incidence of *S.* Enteritidis rose to near the national incidence in both years 2000 and 2001.

Prior to 1998, some *Salmonella* serotypes including serotype Heidelberg were not being monitored in Nebraska. However, from 1998-2001, *S.* Heidelberg appeared to have a similar prevalence in Nebraska compared to the United States (Figure 3). *S.* Heidelberg isolated in Nebraska ranged from 5% to 7% for each year of analysis, compared with national data where the range was 5% to 6%.

*S.* Newport (Figure 4) was isolated more often in the United States than in Nebraska. Between 1997 and 2001, the number of *S.* Newport isolates increased in the United States from 5% to 10%. Overall, the *S.* Newport incidence has increased in Nebraska following the national trend.

The NPHL would like to thank all of the microbiology laboratories in Nebraska for submitting *Salmonella* isolates for serotyping and epidemiological analysis. For questions about this program, please call Beth Schweitzer at 402-559-6098.
Meet the Laboratorian
by Josh Rowland, State Training Coordinator, NPHL

This section of the Newsletter will feature one of the dozens of wonderful people that I have met during my recent “meet and greet” ventures around Nebraska. Over the last 6 months I have had the opportunity to visit 88 laboratory facilities in Nebraska and in turn met over 140 laboratorians.

The featured laboratorian in this issue of the Newsletter is Ruth Uhrich, the Microbiology Supervisor at Great Plains Regional Medical Center in North Platte. She provided these answers to my questions.

What got you interested in pursuing a career in laboratory science?

When I was a senior at North Platte High School, my guidance counselor suggested Medical Technology because I enjoyed math, science and the laboratory. He arranged for me to tour the Great Plains Regional Medical Center’s laboratory, and from then on I was hooked!

Where did you attend medical technology school?

I attended the Medical Technology program at Clarkson Hospital from 1981 to 1982.

How long have you worked in your present location?

I began work at Great Plains Regional Medical Center in North Platte in August 1982, right after graduation (back then, we didn't finish our training until July). That means I have been working here for more than 21 years.

What is the biggest challenge you face in your job today?

It is very difficult to keep up with the constant changes in the lab, especially in microbiology. It seems we go from one crisis to another. Antibiotic resistance to West Nile Virus to SARS to Influenza to Bioterrorism. It never stops.

What are the biggest changes you have seen in the laboratory since you started?

Our lab has gone through many changes, some good and some not so good. One of the best changes our laboratory, made a long time ago, was to become a 24/7 lab, including all holidays. Our lab is also very fortunate to have many new and modern pieces of equipment which help to keep up with the changes in laboratory medicine. Because we are in the process of becoming an official “level B” laboratory associated with NPHL, employee morale has improved as the recognition has given the laboratory more distinction. The hospital is in the process of undergoing a major remodel. As part of the remodel, the hospital has installed a pneumatic tube system to be used through out the institution. This will improve lab turn around times and help our staff become more efficient!

What would be your advice to a first-year medical technologist?

A medical technologist must be able to "go with the flow". Don't make the mistake of being resistant to change because it's inevitable. Enjoy the developments in technology as they become available. Continue with your education after you graduate, it will make you a better technologist and more marketable!
Introducing STATPack™
Secure Telecommunications Application Terminal Package by Ann Fruhling, PhD, UNO and Tony Sambol, Assistant Director, NPHL

The NPHL has been working with Dr. Ann Fruhling, Assistant Professor at the University of Nebraska at Omaha's College of Information Science and Technology, on a new project to help laboratories become more prepared for a bioterrorism event. The project which is funded by a Nebraska Research Initiative (NRI) grant aims to develop a laboratory-based Secure Telecommunications Application Terminal Package™, termed “STATPack™”. The goal of the NRI program is to leverage Nebraska resources to develop new technologies that may have commercial potential.

STATPack™ is a secure, dedicated, HIPPA compliant web-based network system that will support telecommunications between clinical laboratories in Nebraska. In the initial phase of field implementation, the STATPack™ will be placed in regional hospital laboratories throughout Nebraska. This connectivity will allow for immediate communication and data transfer of urgent test related problems by transmitting images and text. This system will serve as means for providing immediate consultation with the NPHL, for example, a “unknown” organism growing from a culture that a laboratory may be processing, or a “suspicious” package delivered to the laboratory. The need for such a system became apparent during the anthrax scare in 2002 when laboratorians wanted immediate answers to questions concerning processing unusual organisms.

The STATPack™ system (Figure 1) consists of a computer terminal and a high resolution digital camera by which pictures of culture plates may be taken. These images and descriptive text messages may be sent to the NPHL for consultation. NPHL will receive a notice that a laboratory is requesting consultation via a pager and on the system. Should a message need to be communicated to the laboratories, the STATPack™ system allows the NPHL to send notices to laboratories including an audible computer alarm.

A future version of the STATPack™ is planned that will allow laboratories to capture microscopic images of Gram or Fluorescent Antibody (FA) stains and send these images to a consultant.

Objectives of the STATPack include:
- Provide a web-based means where the NPHL can interact and share current and timely information with rural health laboratories
- Provide a secure network for transmission of sensitive biosecurity information including health messages and images of laboratory specimens for “real-time” consultation that is HIPPA compliant.
- Provide a repository of laboratory specimen images
- Provide a repository of laboratory messages.
- Provide a user-friendly interface for clinical laboratorians and the NPHL staff.

The NPHL will utilize the STATPack™ system to increase statewide laboratory responsiveness in the identification of biological microorganisms that may be associated with bioterrorism.

For questions about the STATPack™, please contact Tony Sambol at 402-559-3032 or asambol@unmc.edu.

Using nphl.org to order supplies.
1. Go to www.nphl.org
2. Click “SUPPLY ORDERS” link on the red menu bar
3. Enter your name and NPHL account number and click “Log In”
4. Click “Place Orders” and enter volume of supplies wanted, click “Place Order”
5. To check status of orders already placed, click “View Orders”
6. Once you click “View Orders”, you can check on your order status by clicking on the order numbers.
7. Once you click on an order number, you can view:
   - Products ordered, quantity ordered, quantity sent by NPHL, and back order status of your order
8. To change your account information, click “Update Account info” in the “logged in under box”

For more instruction on ordering supplies, call NPHL client services at 866-290-1406 or 402-559-2440.

Figure 1

Save the Date
When: April 14-16, 2004
What: “Back to the River” Annual NSCLS Conference Joint meeting with CLMA and ASCP members
Where: Omaha Hilton
For more information please contact one of the conference organizers:
Roxanne Alter 402-559-8288
Sandra Jameson 402-955-5523
Beth Sargent 800-845-7355 ext. 6853
Mailing Address

IN THIS ISSUE

- Introduction-People in the Laboratory
- West Nile Virus Testing Wrap-Up
- Influenza 2003
- Lactoferrin Stool WBC Test
- Preparing For The Possibility Of SARS
- Update: Salmonella Serotyping
- New Feature-Meet the Laboratorian
- Introducing STATPack™
- Using nphl.org to order supplies

Training/Education Announcements

Bloodborne Pathogen Compliance-The New Needlestick Safety and Prevention Act - Self-Study
What’s New in the 2004 NCCLS Standards for Antimicrobial Susceptibility Testing? - Teleconference
Back to the River-NSCLS Joint meeting with CLMA and ASCP
-New Toll Free NPHL Client Services Number- 866-290-1406

If you would prefer to receive the NPHL newsletter by e-mail, please send your email address to Josh Rowland at jrowland@unmc.edu

The Nebraska Public Health Laboratory Newsletter is a publication of the Department of Pathology and Microbiology, Samuel M. Cohen, M.D., Ph.D., Professor and Chairman, at the University of Nebraska Medical Center. The views expressed here do not necessarily reflect the opinions of the Nebraska Department of Health and Human Services or the University of Nebraska.

Director, Steven H. Hinrichs, M.D. e-mail: shinrich@unmc.edu
Editor, Josh Rowland, MBA, MT(ASCP)  e-mail: jrowland@unmc.edu

Please direct suggestions, questions, or comments to: Josh Rowland, Editor, NPHL Newsletter, 986495 Nebraska Medical Center Omaha, NE 68198-6495 or jrowland@unmc.edu.