Your Public Health Laboratories!

TENNESSEE DEPARTMENT OF HEALTH

It's About Time!

Tennessee Department of Health Public Health Laboratories Newsletter

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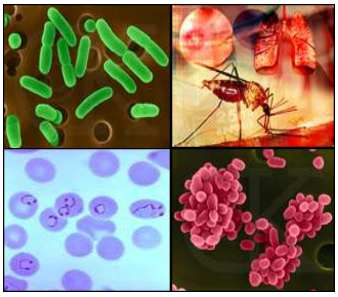
Beware of Unusual Infections in Redeploying Military



The Global War on Terror has continued to incorporate the use of Reserve military personnel for deployment to Afghanistan, Iraq, and other countries in the theaters of operation. The two primary theaters that use most Reserve forces (National Guard and Reserves) are Afghanistan and Iraq. With the return of our military back into the civilian environment, we should be aware of the types of infections that may be seen upon redeployment. Iraq's environmental health risk has significant short-term health risks from ingestion of food and water contaminated with fecal pathogens to extreme heat, high altitude, and airborne dust and sand.

WHO Risk Assessment

Overall, the World Health Organization (WHO) rates Iraq as an Intermediate Risk for infectious diseases, although there are high risk diseases such as diarrhea, hepatitis A, and typhoid fever that can be seen. Intermediate risks include brucellosis, cholera, and hepatitis E. Some low risk infections that are vector-borne disease include malaria, Leishmaniasis, plague, West Nile fever, and Sand-fly fever. Afghanistan has similar environmental risks but the WHO rates Infectious Disease Risk as High. The high risk food-borne and waterborne diseases include diarrhea, hepatitis A, and typhoid fever. The vector-borne diseases list malaria as high risk, especially in troops that fail to comply with prophylactic treatment while in theater.

Bad Bugs Hitching a Ride

Overall, the Office of the Surgeon General for the Army reports that 51 cases of malaria were seen in 2006 and 4 cases have been seen through 21 March 2007. All except one case was deployed in Afghanistan. Over 800 cases of cutaneous Leishmaniasis have been seen along with five visceral cases. Fourteen cases of brucellosis have been reported through May 2007. There have been five cases of Q-Fever and more than 250 cases of multi-drug resistant *Acinetobacter baumannii*.

Contributed by
David L. Smalley, Ph.D.,
Director, TDH Laboratory Services

Home again, returning soldiers greeting family members.

Newborn Screening Specimen Reminders

The purple Newborn Screening forms expired after July 31, 2007, and any specimen collected on these forms after this date will be unsatisfactory. The pink and green forms are still in-date and can be used after July. Forms are available at your local health department.

Same day testing begins on all specimens received before 1:30 p.m. on Monday through Friday. We urge health professionals treating crisis newborns or those indicating a higher risk for inborn errors of metabolism to contact the laboratory as soon as possible after specimen collection to expedite specimen transport to the laboratory.

To expedite specimen receipt, here are some tips about mailing that will ensure your specimens are delivered in good condition and timely received:

1. Specimens should be mailed to the lab between 3 and 24 hours after collection.
2. Send by priority mail or overnight. Remember, any delay in the summer months increases the chance that a specimen can be exposed to enough heat and humidity to affect test results which can lead to the need for an additional specimen.
3. Confirm that you are using the correct mailing address for the carrier used to send your samples to the lab.

For the U. S. Postal Service,
the correct mailing address is:

Newborn Screening
Department of Health
Laboratory Services
P.O. Box 305130
Nashville, TN 37230-5130

For Fed EX, UPS or other
shipping services the address is:

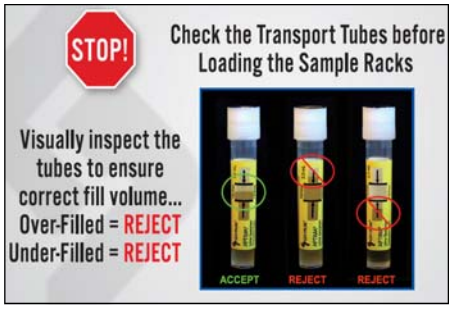
Newborn Screening
Department of Health
Laboratory Services
630 Hart Lane
Nashville, TN 37216

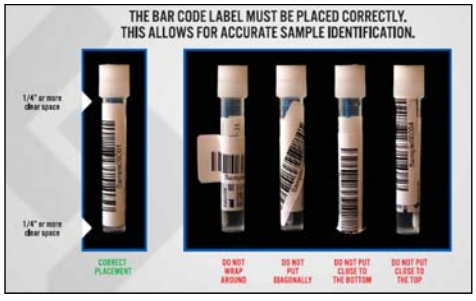
Do Your Part to Reduce Unsatisfactory Specimens

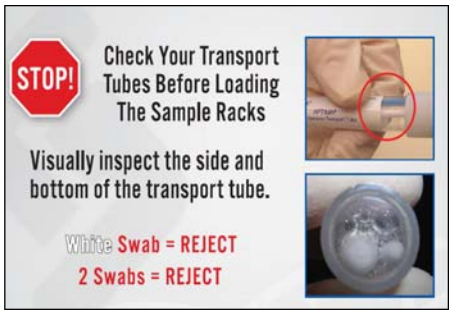
Laboratory Services laboratorians have a characteristic you need to know about...

We really want to test your specimens. We go to great lengths to make sure that every sample that comes in satisfactory condition is processed and tested within the fastest turnaround time (TAT) possible. However, the cliché "Garbage in, garbage out" applies! And no matter how much we want to, unsatisfactory specimens cannot be tested.

Here are a few tips regarding GC/Chlamydia collection tubes. Make sure the urine is at the correct fill volume (pictured right). The volume should appear within the designated window. Fill too low or too high and the sample is unsatisfactory. Patient information should be placed lengthwise on the tube (below) and not cover the volume window or the tube expiration date. Also, ensure that the tube only contains the proper blue swab (pictured lower right). We do not accept PACE tube transports.







New Employees and Promotions

New Hires	Section/Location	Start Date
Keith Gaddes	Biologist, Aquatic Biology, Nashville	5/1/07
Julie Cothern	Clerk, Administration, Nashville	5/7/07
Irmgard Brown	Bioterrorism Coordinator, Nashville	6/1/07
James Hitchman	Chemist, Organic Chemistry, Knoxville	7/23/07
Gregory Harris	Biologist, Aquatic Biology, Nashville	7/1/07

Promotions	Section/Location	Effective Date
Chris McKeever	Tandem Mass Spectroscopy Manager, Nashville	5/1/07
Teresa Smith	Assistant Director, Clinical Division, Nashville	7/16/07

Lab Services Welcomes New Bioterrorism Coordinator

Ms. Irmgard Brown (pictured) has joined the TDHLS as of June 1, 2007 as the Laboratory Bioterrorism Coordinator. Working in the recent past as the Tennessee CLIA Program Manager, Ms. Brown will be familiar to many in the laboratory community because of her position as a CLIA and State Laboratory Surveyor. Ms. Brown graduated from a medical technology program in Germany and worked for 24 years as an Medical Technologist in Germany, New Orleans, and in Nashville at St. Thomas Hospital. Ms. Brown will oversee Select Agent testing for the Central Laboratory in Nashville with oversight responsibilities extending to the regional laboratories in Jackson and Knoxville.

Happy Retirement

Chuck Millstein, Manager of the Memphis and Shelby County Public Health Laboratory is retiring after 15 years with the Memphis and Shelby County Health Department. Prior to joining the health department laboratory, Chuck worked as a clinical laboratory manager in several states including Colorado, Alabama, Texas, Arkansas and Mississippi. In addition, he served his country with distinction and honor for 28 years as an Army officer, both active duty and reserve, receiving two Army Meritorious Service Medals and five Army Commendation Medals.

Laboratory Services Has a New Web Address

Laboratory Services has a new website with more features and information to keep you informed about health related happenings in Tennessee and around the country. Visit our website for current information about food related recalls and other alerts issued by the CDC, FDA and EPA. Laboratory Services credentials, staff contact information, news about upcoming workshops, newsletters and other interesting topics are available there. Just go to:

http://health.state.tn.us/Lab/index.htm

The Scoop on Shiga Toxin-Producing *Escherichia coli*

There are over 100 serogroups of Shiga toxin-producing *Escherichia coli* (STEC) known to cause disease. The most infamous of this group is *E. coli* O157:H7, or STEC O157:H7. This organism gained notoriety in 1982 when it was associated with severe diarrheal illnesses in the Northwest United States after persons consumed undercooked ground beef hamburgers found to be contaminated with STEC O157:H7.

Subsequently in 1994, an outbreak of diarrheal illness in Montana was attributed to STEC O104 as a result of persons consuming milk contaminated with fecal matter. This outbreak is regarded as the first realization that STEC's other than O157:H7 can cause significant disease. A second cluster of non-O157 STEC illnesses were reported in 1996 and illness in all individuals was linked to infection with STEC O111. In addition to recognized clusters of illnesses, individual cases of non-O157 STEC infection were being reported in conjunction with hemolytic uremic syndrome (HUS), a severe complication of Shiga toxin mediated disease that results in kidney failure. A report in 1996 linked a case of HUS in a young child with an STEC O103 infection.

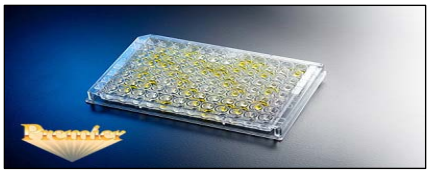
By 2000, it was becoming evident that this group of non-O157 STEC organisms has the potential to cause outbreaks as well as severe complications of infection. The increased number of reports of non-O157 STEC infection prompted the Council of State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control and Prevention (CDC) to suggest that *E. coli* disease reporting be expanded to include all STEC infections not strictly limited to O157:H7. Nonetheless, the true incidence, burden, and source of non-O157 STEC disease remains unclear.

New methodology to aid in identifying non-O157 STEC disease has concentrated on screening assays designed to identify Shiga toxin in a stool specimen utilizing an enzyme immunoassay (EIA). Several EIA test kits have recently received FDA-approval, and many clinical laboratories are contemplating replacing traditional STEC 157:H7 Sorbitol MacConkey Agar culture with the new EIA screening kits. This switch has the positive effect that more cases of Shiga toxin mediated disease will be identified since non-O157 STEC will also be detected. However from a public health perspective, the negative impact of the EIA is the lack of organism isolation and subsequent identification and characterization. In an effort to bridge this gap, the September 29, 2006 issue of the CDC Morbidity and Mortality Weekly Review (MMWR) outlined the public health importance of identifying all serogroups of Shiga toxin-producing *E. coli* from patient specimens. The article included recommendations for clinical laboratories to submit positive Shiga toxin stool specimens to the state public health laboratory for isolation and identification of any O157 or non-O157 STEC contributing to disease.

TDH Laboratory Services' Recommendations for: Laboratories performing Sorbitol MacConkey (SMAC) agar culture –

If the patient specimen is NEGATIVE for O157 STEC and you have an indication from the treating physician that hemolytic uremic syndrome (HUS) or Shiga toxin mediated disease is suspected, you may submit the original stool specimen to your nearest Regional State Laboratory for organism isolation.

"Pictured left is E. coli non-O157 exhibiting typical sorbitol fermentation indicated by the pink colonies. Any of these organisms may produce Shiga toxin. Lower Left is E. coli O157 exhibiting typical sorbitol non-fermentation indicated by the clear colonies. Most E. coli O157 produce Shiga toxin.



Laboratories performing EIA or any Shiga toxin detecting assay –

1) If the patient specimen is POSITIVE for Shiga toxin production, you may submit the original stool specimen along with the positive broth specimen (please include the OD reading) to your nearest Regional State Laboratory for organism isolation.

OR

2) Once you have identified a stool specimen that is POSITIVE for Shiga toxin, subculture the positive broth to a SMAC plate for isolation of STEC O157. If this subculture is NEGATIVE for STEC O157, you may submit the original stool specimen and/or positive broth culture to your nearest Regional State Laboratory for organism isolation.

Contributed by
Robyn M. Atkinson, Ph. D.,
Director, Knoxville Regional Laboratory

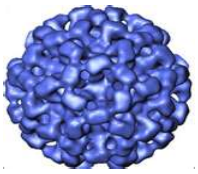
Molecular Biology News

Tennessee Participates in FDA Validation Study

Tennessee is one of eleven laboratories that recently participated in a validation study in collaboration with the FDA Pacific Regional Laboratory. The purpose of this study was to assess a real time polymerase chain reaction (rt-PCR) method for detecting *E. coli* O157:H7 in foods. The study consisted of three challenges containing 18 food items each, processed in duplicate. Food items were assayed by both FERN (Food Emergency Response Network) and BAM (FDA's Bacteriological Analytical Manual) protocols. The foods positive by the FERN rt-PCR method were then plated and confirmed by conventional methods; while foods processed by BAM method were directly plated and confirmed. With the FERN method, a sample can have a preliminary result within 24 hours from initial setup rather than the traditional 48 to 72 hours. The study was completed on July 31, 2007. Results were sent to the FDA Pacific Regional Laboratory for analysis.

Contributed by
Amy M. Woron, Manager
and Jeannette Dill, Microbiologist
Molecular Biology Unit

Jeannette Dill is pictured processing spinach samples for the FERN part of the validation. Previously tested items consisted of cheese and liquid milk. Ms. Dill is a Microbiologist in the Molecular Biology Unit of the TDH Laboratory Services in Nashville.



Detection of Norovirus By Real Time RT-PCR

The leading cause of acute nonbacterial gastroenteritis in industrialized nations, accounting for at least 50% of all food borne gastroenteritis outbreaks in the United States, is Norovirus. Laboratory diagnosis of Norovirus infections has been limited in the past because Norovirus is not able to be cultured in currently available cell lines. Other detection methods, such as the detection of a four fold increase of specific antibodies in acute and convalescent serum are time consuming and less sensitive and specific than molecular testing. Norovirus testing by real-time RT-PCR on stool specimens allows for earlier detection of Norovirus infections and outbreaks due to a shorter turn-around-time for laboratory results.

Norovirus testing is only available through epidemiology consultation.

Specimens must be submitted in Para-Pak C&S transport media (preferred and pictured at right) and pictured at or clean containers and should contain at least one gram of stool. For further information and testing approval contact the local or regional public health epidemiologist in your area.

Contributed by
Amy Woron, Manager
Molecular Biology Unit

TENNESSEE DEPARTMENT OF HEALTH

It's About Time!

Your Public Health Laboratories Help Keep Our Environment Safe!

Environmental Laboratories on a Quest

As far as drinking water certification is concerned, Tennessee is a ***primacy*** State. Primacy means that Tennessee assumes primary responsibility for the administration and enforcement of the Safe Drinking Water Act and the National Interim Primary Drinking Water Regulations and is certified by the Environmental Protection Agency (EPA) Region 4. But the TDH Environmental Laboratories have stated a goal for themselves that will not be easy to achieve. Currently, Florida is the only state in the southeastern region that is NELAP accredited. It is Tennessee's stated goal to join them in the near future.

NELAP is the National Environmental Laboratory Accreditation Program. EPA administers the NELAP which is responsible for the implementation of the NELAC (National Environmental Laboratory Accreditation Conference) standards. The scope of NELAC encompasses all applicable EPA statutes which include the Clean Air Act (CAA); the Comprehensive Environmental Response Compensation and Liability Act (CERCLA); the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); the Federal Water Pollution Control Act (Clean Water Act; CWA); the Resource Conservation and Recovery Act (RCRA); the Safe Drinking Water Act (SDWA); and the Toxic Substances Control Act (TSCA). The sole purpose of the NELAC standards is to provide an acceptable set of performance standards for the environmental laboratory to use in the generation of environmental laboratory data of known and documented quality.

Find the Best Program For TN

The *first step* in seeking NELAP accreditation is to review the list of Accrediting Authorities and to select a state whose accreditation program will fully meet your primary accreditation needs. At present, there are twelve (12) states that are NELAC recognized accrediting authorities. They are California, Florida, Illinois, Kansas, Louisiana, New Hampshire, New Jersey, New York, Oregon, Pennsylvania, Texas and Utah.

Review the Accrediting Rules

The *second step* is to review the accrediting state-specific rules and regulations, and apply for primary accreditation from that accrediting authority state.

Implement Program

The *third step* is to implement a program to comply with the requirements, which cover program policy and structure, proficiency testing, on-site assessment, accreditation process, quality systems, accrediting authority and field activities. Each laboratory is required to have a quality system. The Standards state that "*the laboratory's quality system is the means by which an organization ensures the quality of the products or services it provides and includes a variety of management, technical and administrative elements*."

The TDH Laboratory Services Environmental Laboratory will be seeking NELAP accreditation in

Inorganic Chemistry,
Organic Chemistry,
Radiochemistry,
Aquatic Biology, and
Environmental Microbiology.

For laboratory testing, accreditation will be granted according to

Matrix,
Technology/Method, and
Analyte or Analyte Group.

Matrices will include drinking water, non-potable water (all aqueous samples that are not public drinking water) and solid and chemical materials (includes soils, sediments, other solids and non-aqueous liquids). It generally takes a laboratory 18 months to implement and meet NELAC requirements and become accredited.

Becoming NELAC accredited is a primary goal of the laboratory and meeting the requirements of the program will further assist us as we continue to provide reliable and accurate data to our clients.

Contributed by
Dr. Bob Read Ph. D., Director
Environmental Laboratory and
Kent Shaddox,
Quality Management Coordinator

Laboratory Information System Changes

In an effort to comply with CLIA (Clinical Laboratory Improvement Act) guidelines and state epidemiology requirements, Jackson Regional, Knoxville Regional and Nashville Central Laboratories will require the following demographics for all specimens submitted for any testing protocols. We have begun to migrate to a new computer system and these items are all required fields. By defining a field as required, the system will not allow printing of a final report without these demographics. Please find the required demographics listed below.

1. First and Last Name
2. Date of Birth
3. Sex
4. County of Residence
5. Specimen Collection Date
6. Source of Specimen
7. Submitter identification, including address

Please help us in our effort to change computer systems and store necessary and relevant information.

Contributed by Teresa Smith, Assistant Director, Clinical Division