Department of
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The NH Public Health Laboratories Newsletter

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New Hampshire Public Health Laboratories
Helping Protect the Community Through Service & Education

Flu Testing in Côte D'Ivoire, Africa

Carol Loring, Virology and Special Testing Unit Supervisor

An autoclave the size of my mother-in-law's pressure cooker; cell lines for influenza culture held in customs for three months; an undependable electrical power supply—these are only a few of the challenges faced by our public health colleagues at the Institut Pasteur in Abidjan, Côte d'Ivoire.

On behalf of the Centers for Disease Control (CDC) and the Association of Public Health Laboratories (APHL), I visited the Institut Pasteur for a week in the spring of 2010 as part of an influenza testing capacity assessment team. Recognizing that global influenza surveillance partners have many needs, and that the CDC and the World Health Organization (WHO) lack clear and specific information on exactly what those needs are, the CDC teamed up with the APHL to conduct laboratory assessments at influenza surveillance sites around the globe. The goal was to obtain specific information (e.g. the presence of pipettors, the age of the freezers) so funding would be appropriately directed to improve the laboratory's capacity to perform influenza surveillance.

Carol Loring (left) with colleagues from the CDC and the Institut Pasteur.

I became involved in this project when I read a "help wanted" piece in the APHL online newsletter. The article indicated the need for "experienced influenza testing personnel" who would be willing to travel to countries in Africa, Asia, South America, and Eastern Europe to perform laboratory assessments. Having just finished six months of pandemic influenza testing, I certainly considered myself "experienced," so with the support of the NH PHL director, I applied for the position. Several months later, following trainings, teleconferences, and a myriad of logistical planning, I found myself flying to the West African country of Côte d'Ivoire.

In Abidjan, I worked with a CDC (Atlanta) Influenza Division staff member, as well as a CDC West African project officer. We traveled each day

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to the Institut Pasteur, located on the outskirts of the city. Although Abidjan is a very large and relatively modern city, we still observed many of the sights one might expect to see in a third world country: roadside stands selling everything from garden hoses to carved doors, citizens washing themselves and their clothes in a meandering river, and women walking to market with heavy burdens of mangos, eggs, or water perched perilously on their heads.

At the Institut Pasteur, we were shown a modern molecular diagnostics laboratory as well as a traditional viral culture laboratory. The staff of the molecular diagnostics laboratory routinely perform real-time polymerase chain reaction (rtPCR) assays for measles, polio, and influenza. We were impressed by the Institut's highly organized Biobank, where specimens were catalogued and stored in -70°C freezers. Although the Biobank manager was embarrassed that there was a puddle of water on the floor caused by rainwater leaking through the roof, we assured her that we often face the same problem when spring rains arrive in New Hampshire.

While the staff of the Institut Pasteur consists of many highly trained scientists, they face many challenges to the daily operation of their laboratory. Besides the difficulty in getting reagents through customs, they also have difficulty in getting vendors and installation engineers to come and set up new equipment. While there, we were shown a genetic analyzer and a rtPCR instrument, both in packaging and waiting for installation. The explanation from the vendor? Côte d'Ivoire is a "dangerous" country and instrument engineers would not travel there unless they were guaranteed 24-hour security. My companions and I exchanged glances thinking, "If it's so dangerous, what are WE doing here?"

The only autoclave in the entire lab was this outdated model, which was the size of an office trash receptacle.

Streets of Abijan

The Institut Pasteur

Through detailed questioning we were able to catalogue all the equipment used for influenza testing (biosafety cabinets, refrigerators, freezers, pipettors, etc.) and discern where the CDC may be able to provide some assistance. We reported on the unpacked equipment, potential language barriers in package inserts (Ivoirians speak French, but were following a package insert in English) and the need for quality assurance training.

The experience was quite eye-opening in understanding how truly global the search is for novel strains of influenza. I certainly have a new appreciation for the ease with which I can pick up the phone and order a reagent and have it in my hands the next day. Best of all, following our debriefing by the CDC West African Project Officer, we were told that a vendor representative would be traveling to Côte d'Ivoire to unpack and install the dust-gathering genetic analyzer and rtPCR thermocycler immediately.

Flu Season — What Can We Expect?

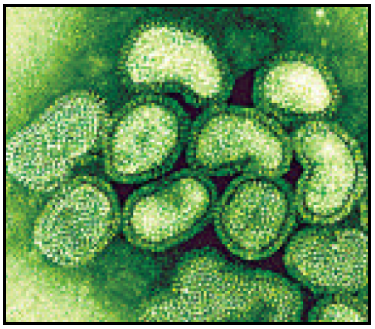
Denise Bolton, Emergency Preparedness and Arbovirus Unit Supervisor

Flu seasons are unpredictable in a number of ways. Although outbreaks of flu happen every year, the timing, severity, and length depend on many factors, including which strains are circulating and whether they match the strains in the current vaccine. Last flu season (2009-2010) saw the emergence of the 2009 H1N1 influenza virus (previously called "novel H1N1" or "swine flu"). This virus caused the first influenza pandemic (global outbreak of disease caused by a new flu virus) in more than 40 years.[1] While not certain, it is likely that the 2009 H1N1 viruses will continue to spread along with seasonal viruses in the U.S. during the 2010-2011 flu season.

The New Hampshire DHHS recently sent a Health Alert Network (HAN) message to physicians, nurses, infection control practitioners, hospital emergency departments, and local health departments about the upcoming influenza season.[2] The NH DHHS recommendations include: awareness of ongoing low-level circulation of seasonal influenza (H3N2 and B) in the US, review of current influenza testing guidelines in New Hampshire, encouragement of vaccination for all individuals older than six months of age (without contraindication) in accordance with updated Advisory Committee on Immunization Practices recommendations, and awareness of additional vaccine information (Fluzone and Afluria).

The 2010-2011 trivalent seasonal influenza vaccine is already available in several places in New Hampshire and it contains three antigens: A2009H1N1, AH3N2, and influenza B. The A2009H1N1 antigen is the same as the H1N1 vaccine from last year, the H3N2 is a new antigen, and the influenza B strain was in last year's seasonal vaccine.

Influenza surveillance information and diagnostic testing can aid clinical judgment and help guide treatment decisions. The accuracy of diagnosing influenza on the basis of symptoms alone is limited because symptoms from illness caused by other pathogens can overlap considerably with influenza. Influenza surveillance by state and local health departments and the CDC can provide information regarding the presence of influenza viruses in the community. Surveillance can also identify the predominant circulating types, influenza A subtypes, and strains of influenza.



2009 A(H1N1)pdm influenza virus

Collecting clinical specimens for viral culture is critical because only culture isolates can provide specific information regarding circulating strains and subtypes of influenza viruses. This information is needed to compare current circulating influenza strains with vaccine strains, to guide decisions regarding influenza treatment and chemoprophylaxis, and to formulate vaccine for the coming year. Virus isolates are also needed to monitor the emergence of antiviral resistant strains and the emergence of novel influenza A subtypes that might pose a pandemic threat.

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What is a…?		
Antigen	A substance that can stimulate the production of antibodies.	*In this article, antigen refers to the viral proteins from certain flu virus subtypes.*
Type	There are three types of flu virus: A, B, and C.	*Typically only types A and B infect humans.*
Subtype	Influenza A viruses are further categorized based on their surface proteins hemagglutinin (H) and neuraminidase (N).	*Examples of subtypes are 2009 pandemic A/H1N1 and seasonal subtype A/H3N2.*
Strain	Influenza A and B viruses are further categorized based on where and when they were isolated.	*The strains used in the 2010-2011 northern hemisphere vaccine are A/California/7/2009 (H1N1)-like virus, A/Perth/16/2009 (H3N2)-like virus, and B/Brisbane/60/2008-like virus.*

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The NH PHL tests for seasonal and pandemic influenza using an FDA-approved real-time reverse transcription PCR (rRT-PCR) panel. The NH PHL also performs viral culture on a subset of specimens and routinely sends isolates to CDC for antigenic characterization and antiviral resistance testing.

The NH PHL relies upon a network of sentinel providers and hospital laboratories throughout the State to submit specimens during the flu season.

During the pandemic, testing criteria were implemented to help manage the resources of time, supplies, and personnel. This year, because it is early in the season and influenza activity is low, we encourage providers to send all samples from patients with clinical evidence of influenza, but particularly from those with underlying medical conditions, pregnant women, and hospitalized patients. This will allow for viral characterization of the locally circulating strains. Testing guidelines will likely become more targeted as the season progresses.

For technical questions on influenza testing, please contact the Virology Program at (603) 271-4620.

References
1. Seasonal Influenza [Internet]. Centers for Disease Control and Prevention [cited 2010 Sept 16]. Available from: http://www.cdc.gov/flu
2. Influenza 2010-2011 [Internet]. New Hampshire Health Alert Network [cited 2010 Sept 16]. Available from: http://www.dhhs.nh.gov/dphs/cdcs/alerts/documents/20100827flu.pdf

Send us your influenza specimens! We would like to receive upper respiratory specimens, particularly flocked nasopharyngeal and nasal swabs, from patients exhibiting ILI in order to determine what's circulating in New Hampshire!

Chemistry Unit Awarded Two Federal Grants

Sally Hartman, Chemistry Program Manager
with preparation by Susanne Desrosiers, Microbiologist, Virology and Special Testing Unit

The Chemistry Unit at the NH PHL has recently been awarded two federal grants allowing the creation of three new positions.

The United States Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS) grant will fund one full-time and one part-time laboratory scientist for melamine testing. Melamine is a nitrogen-rich chemical which may be used as a filler in order to falsify the protein content of food products. This one-year, renewable research grant involves the testing of swine liver, kidney, muscle, and urine samples. The NH PHL is one of only three laboratories in the nation to receive this grant and is uniquely qualified since the lab became experienced with testing for melamine during the 2007 contaminated pet food incident.

The USDA grant will also allow the lab to hire one part-time scientist to help build upon our existing shellfish toxin testing program. We plan to improve the sensitivity of our method and expand it to include related toxic compounds.

In addition to the USDA grant, the Food and Drug Administration (FDA) awarded the NH PHL a five-year grant which will fund one part-time toxicologist position. This grant covers several areas of testing in the laboratory. It acknowledges the NH PHL as a chemistry cooperative agreement laboratory, under which the food testing program will be expanded by developing the ability to detect additional compounds. Some of these funds will also be applied to the shellfish testing program, allowing development of methods for detecting other toxins besides paralytic shellfish poison (PSP) such as neural, amnesic, and diarrheic toxins. The mussel tissue used to test for toxins will also be used to perform some metals testing. These mussels will be harvested from two locations in New Hampshire – Hampton Harbor and the Isles of Shoals.

The FDA grant also makes the NH PHL a validation and method development laboratory for the FDA. Lastly, this grant authorizes the NH PHL to act as a surrogate laboratory for the FDA in emergency situations.

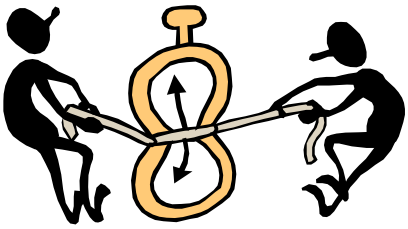
LEAN in the Lab

Jill Power, MS, M(ASCP), CQA(ASQ) Quality Assurance Manager

The NH PHL strives to provide high quality testing by continuing to have successful inspections, accreditations, and certifications from the Centers for Medicaid and Medicare Services (CMS), the American Industrial Hygiene Association (AIHA), the FDA, the USDA, and the CDC. The NH PHL holds a certification of compliance by the Clinical Laboratory Improvement Amendment, 1988 (CLIA), and the ISO 17025 Standard.

After many successful inspections, with strict quality control (QC) practices and quality assurance (QA) programs, the next management step is quality improvement (QI). Under this umbrella is the opportunity to critique our own internal and external processes for ourselves, our stakeholders, and our clients. One way to do this is by utilizing a continuous improvement method, such as Lean. Based on The Lean Institute definition, Lean stands for creating more value for customers with fewer resources.[1]

Our journey to continuous improvement began with an introduction to Lean principles and processes by facilitators from the New Hampshire DHHS, Bureau of Human Resources.



For our initial meeting, all staff members were introduced to the Lean process and the activity to evaluate. The activity chosen was to make the specimen receiving process run more efficiently, which would decrease turn around times for lab testing. Specimens arrive via many different avenues, such as private courier services, the mail system, and hand delivery. With many interruptions and unpredictable times of specimen arrival, it was determined that the process needed to be streamlined to avoid potential errors and delays in testing. The task of reviewing the current state of the Central Receiving Unit was laid out, ground rules were read and posted, and Commissioner Toumpas' belief in the process was explained. The project charter was described and the roles of sponsor, project manager, direct staff team members, and interested partners were revealed.

In the first work session, all participants were asked to write down each step of the process, on individual pieces of paper, as they knew it to occur. Sixteen steps were identified and pieces of paper representing those steps were posted on a wall to create a working value stream map (VSM). The value stream map became clear as the group worked to identify the many steps that occur between the receipt of a lab specimen and the hand-off of that specimen to the individual testing unit. The group then put together a data sheet for each step that defines the actual work time it takes to complete the task, the elapsed time between steps, and the percentage of accuracy needed to complete the step correctly the first time. It also allows for any special considerations about the step itself.

The initial value stream map, consisting of all of the steps from specimen receipt to transfer to testing unit.

On the second day, the facilitators arrived with a printed value stream map. Seeing the steps in a flow chart form was a great visual aid. Any information related to each step was also applied to the map. The group was then encouraged to leave pain points or ideas on the map during the upcoming week. A pain point is an area where the process is questioned and clarification may be needed.

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Laboratory Updates and Trainings

Jill Power, MS, M(ASCP), CQA(ASQ) Quality Assurance Manager and
Amanda Archambault, Microbiologist, Virology and Special Testing Unit

ARBOVIRUS SEASON SUMMARY - The 2010 mosquito surveillance season began on July 1 and ended on October 1. A total of 2215 batches of mosquitoes were collected and tested, with one West Nile virus (WNV) positive batch from Manchester. Over the summer months, eight animals were also tested for WNV and eastern equine encephalitis virus (EEE), with one EEE positive horse from Freedom. The NH PHL accepts human serum and cerebrospinal fluid specimens for WNV, EEE, and St. Louis encephalitis virus (SLE) testing year-round; so far this year one patient was determined to be positive for WNV (from Hillsborough County).

SPECIMEN DELIVERY - Without the State contracted courier, specimens are finding their way to Concord. Many providers are using the postal system, have privately contracted with a courier service, or are hand delivering them. As a quality measurement, specimen turn-around times will be assessed to determine if testing is delayed or if specimens are compromised. If you have any comments or concerns about sending your specimens to us, please contact Jill Power, Quality Assurance Manager at (603) 271-5869 or email jill.j.power@dhhs.state.nh.us.

COMPLAINTS - One of the quality system requirements for the CLIA, the College of American Pathologists (CAP), and the International Organization for Standardization (ISO) is to inform your clients, patients, customers, or personnel about making complaints when it comes to laboratory services or operations. A complaint is any concern that you may have about a laboratory's operation. Examples include, but are not limited to: quality of testing, unlabeled specimens, unethical practices, confidentiality of patient information, and laboratory personnel qualification or responsibility issues. The CMS has information on their website about how and where to report a complaint.[1] The CMS regional offices of the CLIA contact list is located at: http://www.cms.hhs.gov/CLIA/downloads/CLIA.RO.pdf. This list will guide you to the proper authorities. The CMS website also has a brochure to download and print if you wish to post it in your facility.

Reference
1. Clinical Laboratory Improvement Amendments Overview [Internet]. U.S. Department of Health and Human Services. Centers for Medicaid and Medicare Services [cited 2010 Sept 3]. Available from: http://www.cms.hhs.gov/clia

TRAINING and CONTINUING EDUCATION PROGRAMS - The following is a list of continuing education (CE) teleconferences or meetings that will be presented at the NH PHL through the end of 2010. The programs are free and there is no registration form. If you would like to attend one of the these teleconferences, please contact Carol Laurin, Training Development Manager, at (603) 271-1383 or cmlaurin@dhhs.state.nh.us to register and make arrangements for visiting the secured lab. Please arrive 15 minutes before the time of the program. CE credits can be earned for most programs.

Date	Program	Time	Room
12/01/10	New Hampshire Laboratory Response Network Meeting	9:00 - 12:00 pm	216
12/07/10	After Dark: A Discussion about Dermatiaceous Fungi, Part 1	1:00 - 2:00 pm	216
12/14/10	After Dark: A Discussion about Dermatiaceous Fungi, Part 2	1:00 - 2:00 pm	216

Welcoming New Faces, Saying Good-bye to Friends, and Exciting Promotions at the NH PHL

Farewell George Robinson, Thank You for Your Service

George Robinson retired on July 30, 2010 after twenty-seven years working for the State of NH. Before starting his nineteen years at the NH PHL, some of you may recognize him as the State CLIA inspector. He spent many years going to private labs and doctor's offices checking laboratory methods, procedures and personnel records to ensure compliance with CLIA regulations. George came to work for the NH PHL in 1991 in the Inorganic Chemistry Unit. He was the supervisor of the Childhood Lead Unit for the majority of the time he worked in the lab. He also developed and implemented testing for mercury in fish, which resulted in fish advisories for many NH lakes. In addition to his bench work, George, with assistance from the PHL Quality Assurance Manager, guided the laboratory through ISO 17025 level certification of the environmental lead program through the AIHA.

In 1999, George was chosen to represent the United States as a member of a four-person team sponsored by CDC to evaluate the health care system in Nicaragua following the devastation of Hurricane Mitch. His years of being an inspector and working in the laboratory made him highly qualified to assess the materials and equipment needed to get the health care system functioning again after the hurricane.

George was the laboratory's 'MacGyver' and was very inventive in keeping the instruments running using a variety of methods and unusual 'tools.' Now that he has retired he plans to use his vast knowledge and abilities to complete his wife's 'honey-do' list.

Welcome Back, Dr. Madhumita Chatterjee!

Dr. Madhumita Chatterjee (Madhu) rejoined us here at NH PHL on October 15. She has accepted the Toxicologist IV position, vacated by George Robinson and will be the new Chemistry Unit supervisor. During the State of New Hampshire's fiscal evaluation process, Mahdu was reassigned to the Rural Health and Primary Care Section as the Program Manager. Prior to reassignment, Madhu had worked at the NH PHL for six years in the Inorganic Chemistry Unit, performing trace metals analysis. We're very happy to welcome her back!

Welcome Sandie White, Administrative Secretary

We are delighted and fortunate to have Sandie White as the new Administrative Secretary to the PHL director. Sandie has a varied background in State service over many years, having worked at the Division of Motor Vehicles, Fish and Game Department, Office of State Planning, New Hampshire Technical Institute, and most recently as a Program Assistant at the Bureau of Elderly and Adult Services. She came to the PHL because of a wish to return to more administrative work, and she brings many skills acquired during her past positions. She has a penchant for organization, enjoys multitasking, and especially likes working on projects independently and learning new things. Sandie is a New Hampshire native and when not at work she spends her time fishing, hiking, flower and vegetable gardening, raising chickens, and making homemade soap. We are particularly glad to welcome her as a new member of the Newsletter Committee!

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Congratulations, Alma Vazquez!

Alma Vazquez, Laboratory Scientist II, accepted the Food Emergency Response Network (FERN) FDA-funded position in June 2010. Prior to this new position, Alma began working for the NH PHL in November 2009 in a temporary position to help test the influx of H1N1 specimens. Her new position is also in the Molecular Diagnostics Unit, and her new duties will concentrate on molecular testing for pathogens and their toxins found in foods. The FERN, FDA, and USDA have recently validated or are in the process of validating numerous methods for molecular screening of foods for food-borne pathogens; the NH PHL will be using the approved methods for numerous regulatory samples and will be participating in many validation studies this coming year. We are very happy that Alma has stayed with us here in the NH PHL.

Congratulations, Amanda Archambault!

Amanda Archambault (Mandi) has recently been promoted to Microbiologist II under the federally funded Emergency Laboratory Capacity (ELC) grant. Mandi's work will center primarily on influenza testing and reporting. She will perform molecular methods for influenza detection as well as respiratory virus culture. She will also be responsible for reviewing protocols, keeping track of CDC updates, and handling outreach to the Laboratory Response Network (LRN) and New Hampshire hospitals and providers on flu-related issues. Mandi has been with the NH PHL for over four years in the Virology and Molecular Diagnostics units, after having served as a summer intern here during her undergraduate study.

Employee Spotlight: Hannah Doyle

Hannah earned a Bachelor of Fine Arts degree from the NH Institute of Art in 2006.

Interviewer:
"How have you brought your talents to the PHL?"

Hannah:
"I work full time in the Central Receiving Unit doing, among other duties, a lot of data entry. This part of my job has given me a number of computer skills. These computer skills have allowed me to incorporate our PHL logo onto the computer. This way, we can have access to the logo to put on our requisitions, newsletters and other PHL publications.

I am also the resident illustrator for the PHL newsletter. You may remember the fall issue of 2009, for which I drew the raccoon 'baiting' illustration to go along with the rabies article. In the last issue, I was able to draw the cartoon for the jumble puzzle. An illustration allows people to be able to visualize aspects of the article and makes it more memorable. I'm not saying the articles aren't important! They give so much interesting, and in some cases life-saving, information. It is just that illustrations add another dimension to the articles. Well, maybe not to the jumble, but that drawing was just plain fun!

I have also done some drawings for coworkers. A couple of years ago I was commissioned by a staff member to draw a portrait of her dog. Recently I was asked to draw a poster for a staff member that retired. So, I drew George waving to us as he drove off in his favorite Corvette. This last winter, I held an auction of my watercolors to raise enough money to go to Egypt on a mission trip. That trip opened my eyes to the varied problems and public health concerns in another country.

I never thought working for a laboratory would give me opportunities to utilize my art degree. I feel very fortunate."

Try Your Luck with the NH PHL Logic Problem!

The NH PHL has a wide and diverse staff. Each unit is made of up a number of staff members with varying degrees of expertise and various hobbies. In the Virology Unit, each member is assigned a weekly task that must be performed on a certain day of the week (Monday through Friday). Each staff member has a job title, hobby, and work assignment. From the clues below, can you determine each employee's name, job title, hobby, assignment, and which day they performed their assignment?

1. The five employees are Heather, the Microbiologist II, the photographer, the one with Tuesday's assignment, and the person who is working on a respiratory virus study.
2. The employee who writes the weekly schedule performs this task the day before the Microbiologist III performs her task and sometime in the week after Alma does her task.
3. The choral singer (who doesn't float to the Microbiology Unit) and the pet enthusiast perform their tasks, in some order, 48 hours apart; the Laboratory Helper performs her task on the day between these two.
4. Kristin performed her task sometime before the person who is planning a wedding and sometime after the person who ran the strand displaced amplification (SDA) test for chlamydia and gonorrhea.
5. The Laboratory Scientist II and the kayaker were, in some order, the ones who performed their tasks on the first and last days of the week.
6. Sue performed her task the day after the employee who performs the weekly instrument maintenance, who performed her task the day after the Laboratory Scientist III.

Name	Title	Hobby	Task	Day

	Micro III	Lab Helper	Micro II	LS II	LS III	Singer	Kayaker	Pet lover	Photographer	Wedding	Maintenance	Resp. Study	Schedule	Float	SDA	Monday	Tuesday	Wednesday	Thursday	Friday
Sue																				
Carol																				
Kristin																				
Alma																				
Heather																				
Monday																				
Tuesday																				
Wednesday																				
Thursday																				
Friday																				
Maintenance																				
Resp. Study																				
Schedule																				
Float																				
SDA																				
Singer																				
Kayaker																				
Pet lover																				
Photographer																				
Wedding																				

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The third session incorporated all of the ideas, suggestions, and pain points to realign a future state VSM. The future state VSM reduced the number of steps in the current state to eight (a 50% reduction) by changing tasks, eliminating movement, or rear-ranging equipment. The sponsor, project manager, and team members met to assure the project charter was still within the scope that was defined. Upon approval by the sponsor, the planned changes, recommendations, and solutions were scheduled for implementation. Once implemented, the group will re-evaluate the new process in three months to look for improvement in efficiency and for savings in time and resources.

This project is a valuable activity that not only achieves efficiency to reduce waste within the work environment, but is also a great team building exercise. Many staff members were enthusiastic about participating in an improvement process where their voices were heard. It is from their valuable input that we will show success in this Lean project and future efforts at the NH PHL to improve the quality of laboratory services, customer satisfaction, and show the savings of resources.

References
1. What is Lean? [Internet]. The Lean Institute [cited 2010 Oct 20]. Available from: http://www.lean.org/WhatsLean/

The specimen receiving area before Lean.

The specimen receiving area after Lean.

Contact us!!

New Hampshire Department of Health and Human Services
Nicolas Toumpas, Commissioner
Division of Public Health Services
Bureau of Laboratory Services
Public Health Laboratories

The Department of Health and Human Services' mission is to join communities and families in providing opportunities for citizens to achieve health and independence.

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Please call (603) 271-4660 to reach the lab directly or email Jill Power at jill.j.power@dhhs.state.nh.us with any newsletter-related questions.

NH DIVISION OF Public Health Services
Improving health, preventing disease, reducing costs for all

Special thanks to the contributors to the newsletter—in addition to their daily responsibilities, they also graciously agreed to write for us!

The NH PHL Newsletter Committee:
Rebecca Adams, Amanda Archambault, Susanne Desrosiers, Jill Power, Peggy Sweeney, and Sandie White