Illinois Department of Public Health
Newborn Screening Laboratory Subcommittee
Illinois Department of Public Health, Division of Laboratories
2121 W. Taylor St., Chicago, Illinois
Meeting and Conference Call Minutes: February 27, 2013

Subcommittee Members Attending:
George Hoganson-University of Illinois at Chicago – Chair
Gopal Srinivasan- Mt. Sinai Hospital
Denise Lonigro-Advocate Christ Hosptial
Kristin Clemenz-Lurie Children's Memorial

IDPH Staff:
George Dizikes, Khaja Basheeruddin, Rong Shao, Jennifer Crew, Joel Price, Tom Johnson, Claudia Nash, Tracey Kreipe, Shannon Harrison, Dennis Tiburzi

The meeting was called to order at 9:05 AM, followed by introductions. Denise Lonigro, a recently appointed member replaces Sunetra Reddy, who resigned after many years of service on this committee.

Old Business
Dr. Dizikes did clarify a statement in the minutes of the previous meeting, of September 26, 2012, that was somewhat misleading. The statement indicated the IDPH molecular lab "may" be capable of performing mutation testing for Krabbe disease. While this is true, Dr. Dizikes noted that it is likely IDPH will be sending samples to the New York state lab for this test.

The minutes of the September 26, 2012 meeting were approved.

Dr. Hoganson recognized two individuals for their years of service to this subcommittee.
- Sunetra Reddy, from the University of Chicago Hospital Laboratory, who recently resigned, and
- Barb DeLuka of the IDPH Newborn Screening Follow up Program, who retired December 31, 2012

New Business

Laboratory Report
Staffing and Laboratory Resources:
There have been no recent additions to NBS laboratory staff and Dr. Dizikes indicated that they have sufficient staff on hand to manage the current work flow, and the expanded LSD and SCID testing. He also stated that space on the second floor of the Chicago lab is being renovated and the entire newborn screening laboratories will be consolidated and moved to this floor, which will greatly improve the efficiency of the operation.

Data System/Reports:
Progress continues with the implementation of electronic transfer of data between Northwestern Memorial Hospital and the IDPH Newborn Screening Laboratory. Northwestern was selected as the first hospital with which IDPH will develop an HL7 interface, since the greatest number of births in the state occur at this facility. Other hospitals are also expressing interest, and IDPH will be contacting them to continue development of electronic data exchange which will improve accuracy of patient demographic information and allow for automatic transfer of newborn screening results into the patient's medical record. Denise Lonigro indicated that she would be willing to work with IDPH on electronic data exchange with Advocate Christ Hospital.

Dr. Dizikes indicated that the newborn screening laboratory report may need to be expanded to a three page report when testing for lysosomal storage disorders and SCID goes into effect. He also indicated that there is some progress being made towards "eReports" with the Perkin Elmer data system, where health care providers could access the IDPH newborn screening data system to obtain test results for their patients.

Cystic Fibrosis (CF) Screening:

The new Hologic mutation panel was implemented at the IDPH NBS lab the first week of December 2012, and has improved automation, and has allowed for easier DNA extraction, and reduced the testing turn-around time by one day. Subsequent to recommendations from the Illinois NBS Cystic Fibrosis Collaborative, presence of the benign I148T mutation is no longer being reported. A new mutation that is on the Hologic panel, D1270N, is occurring at a higher frequency than expected, and has been identified in 2.5% of the 1,456 samples that have been tested to date using the Hologic panel. So far, the D1270N mutation has been reported in carriers only as a single mutation and has not occurred as a compound heterozygote. Cystic fibrosis clinical experts have advised that this mutation be reported, since there are reports in the literature of it being disease causing when it occurs with certain other mutations.

After discussion with several Illinois CF Center Directors and the Chairman of the IDPH Institutional Review Board, it has been decided that IDPH will participate in a project being conducted by the state of Wisconsin to test newborn blood spots with an expanded panel of 157 CF mutations. Since this is being considered as a quality improvement project, where newborn screening samples will basically be receiving more extensive CF mutation testing, it is not considered as research. Illinois samples that have been identified by testing with the IDPH Hologic mutation panel as having one mutation, will be de-identified and submitted to the Wisconsin lab for expanded mutation testing. If additional mutations are identified, this information will be provided to the primary care physician and CF centers. These newborns will continue to be referred to CF centers for sweat testing.

It is not certain when the expanded testing will begin and necessary modifications will need to be made to the existing Perkin Elmer newborn screening database to allow for reporting of these additional mutations.

Blood Spot Storage/Use

Dr. Dizikes indicated that IDPH will be developing a more in depth policy regarding residual newborn screening blood spot use and storage. With the remodeling of the IDPH Chicago Laboratory, space will be available in the basement area, which could be used for blood spot storage. To retain all blood spots and preserve the integrity of the sample, -70 degree freezers would need to be purchased, and additional staff would be needed to maintain this inventory. Currently specimens that are normal are retained for two months at room temperature, samples with borderline abnormal results are retained under refrigeration for a minimum of at least four months, and presumptive positive specimens are kept frozen for a minimum of at least five years.

Non-Derivatized Amino acid and Carnitine Testing

Some preliminary proficiency and quality control testing has been performed already at the IDPH lab with the non-derivatized method for amino acid and acylcarnitine analytes. The lab is awaiting the delivery of the new tandem mass spectrometers which will be obtained from Perkin Elmer, after the contract is signed. It is anticipated that use of this new method should occur in about one year after all the needed equipment is obtained.

The new non-derivatized method will allow succinylacetone testing on all samples, which will help identify possible cases of tyrosinemia Type I, but will have difficulty detecting malonic acidemia, one case of which has been detected in the past 10 years. Dr. Hoganson noted that there has been an increase in the number of newborns in the neonatal intensive care unit with high tyrosine. This may be due to changes in NICU feeding practices, where these babies are getting more tyrosine in their diet. To date, no cases of tyrosinemia type I have been detected.

Newborn Screening Laboratory Subcommittee Minutes- Feb. 27, 2013

Lysosomal Storage Disease (LSD) Screening:

Progress is being made in implementing contracts with the vendors to supply the necessary equipment for LSD testing. Establishment of a three-year contract with Perkin Elmer is in its final stages for the lease of tandem mass spectrometers for LSD testing and for the non-derivatized testing for amino acid and acylcarnitine analytes. The IDPH lab will implement a six-plex assay for all mandated LSDs except MPS II. The IDPH lab has received modified internal standards from the University of Washington and has started validation studies using de-identified samples from their regular batch of newborn screening specimens. The IDPH lab has also participated in a proficiency testing program from the CDC and has correctly reported test samples from patients with Krabbe and Pompe disease. Currenly two tandem mass spectrometers are on loan from Perkin Elmer at the IDPH lab, each of which can accommodate three 96 well microtiter plates per run. One of these instruments is being used to develop LSD testing. (The other is being used to validate the non-derivatized method for amino acids and acylcarnitines.) Additional instruments will be delivered from Perkin Elmer over the next few months. Once all the necessary tandem mass spectrometers are in place, cut-off studies will be completed and a pilot test period will occur with samples being screened from two hospitals to make sure the process is working without flaws. The timeline for statewide LSD testing implementation is projected as being July 2014.

Substrates are not yet available for MPSII testing but may be available from the University of Washington in the near future. The test for MPS II can be multiplexed into the existing six-plex assay for the other LSDs, which will allow for all seven disorders to be tested in one assay.

The IDPH lab is pursuing a contract with the state of New York to perform Krabbe mutation analysis; it is expected that Illinois will identify 4-5 newborns with possible Krabbe disease each month, at a cost of $500 for each to receive mutation testing.

Dr. Barbara Burton, chair of the IDPH Lysosomal Storage Disease Subcommittee, is planning a face to face meeting at Lurie Children's Hospital May 17, 2013, to provide Illinois medical specialists with an update from the IDPH laboratory and Dr. Burton has also invited Dr. Kathy Grange from Washington University to discuss the outcome of LSD testing in Missouri .

Severe Combined Immune Deficiency (SCID) Screening:

Dr. Crew reported that they IDPH lab has received the high throughput thermocyclers, which are now in place but still need to be interfaced with the Perkin Elmer data system. The bidding process is open for the high volume extractors that are also needed for SCID testing. Validation studies can begin when all equipment is in place. The IDPH testing method will be validated through sample sharing and testing by Perkin Elmer Genetics. Prior to statewide implementation, a pilot testing period will be done with samples from only one or two hospitals. Full scale statewide testing will occur by July 2014.

Endocrine and Hemoglobin Disorders

No changes have been made to testing methodologies for congenital hypothyroidism, congenital adrenal hyperplasia, or sickle cell disease and there are no new issues with these disorders.

Follow-up Program Report

Three newborn screening staff have accepted a promotion elsewhere at IDPH . One position has recenty been replaced and two full time vacancies remain, in addition to the nurse position vacated by Barb DeLuka's retirement. A hiring freeze is currently in place for all state positions. Tracey Kreipe, the nurse in charge of supervising half of

the newborn screening clerical staff will now be assisted by Shannon Harrison, the nurse educator in the newborn screening program who has temporarily been assigned to supervise the newborn screening staff who formerly reported to Barb DeLuka.

Follow up staff have been receiving an increase in the number of requests for data, including more extensive reports for hospitals regarding timeliness of specimen submission. Responding to these requests is very time consuming and laborious since the Perkin Elmer newborn screening data system does not allow staff to prepare ad hoc reports. Additional staff assigned to address newborn screening data requests would be helpful.

Critical Congenital Heart Disease (CCHD):

Claudia Nash reported that the IDPH CCHD work group that has met for the past year, will be submitting their final report to the Genetic and Metabolic Diseases Advisory Committee at the April 18 meeting. This group, which has been chaired by Dr. Praveen Kumar of Northwestern Memorial Hospital, has developed a uniform hospital screening protocol and data collection tool and has recommended that CCHD screening be integrated into the existing newborn screening follow up process. The American Heart Association has introduced legislation to amend the hospital licensing act, that will require hospitals to conduct CCHD screening and another bill will be introduced to amend the current newborn screening legislation to require CCHD screening. Newborn screening administrative rules will need to be amended to describe the specific requirements of screening implementation.

Other Discussion

Dr. Dizikes continues to serve as the Newborn Screening Section Chief, although the position continues to be advertised. It was discussed that the state application process can be confusing, and that potential applicants need to be guided through this process.

Dr. Hoganson indicated that there should be further discussion regarding cutoffs for MS/MS analytes at the next meeting, which is scheduled for June 5, 2013 from 1-3 pm.

The meeting was adjourned at 9:55 am.