# Advisory Committee on Heritable Disorders in Newborns and Children

Meeting Summary

May 13–14, 2021

The Advisory Committee on Heritable Disorders in Newborns and Children (Committee) meeting was convened on May 13, 2021, and adjourned on May 14, 2021. In accordance with the provisions of Public Law 92-463, the meeting was open for public comment.

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**Committee Members**

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Professor of Pediatrics
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Co-Director, Newborn Screening Laboratory
Wisconsin State Laboratory of Hygiene

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Associate Director, Mailman Center for Child Development
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CEO Newborn Foundation

**Scott M. Shone, PhD, HCLD(ABB)**
Director
North Carolina State Laboratory of Public Health

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**Centers for Disease Control & Prevention**
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Medical Director, Newborn Screening and Genetics
Texas Department of State Health Services

**American College of Medical Genetics & Genomics**
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American Family Children's Hospital
Professor of Child Neurology, University of Wisconsin School of Medicine & Public Health

**Department of Defense**
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Lieutenant Colonel, Medical Corps, U.S. Army
Chief, Genetics, Madigan Army Medical Center

**Genetic Alliance**
Natasha F. Bonhomme
Vice President of Strategic Development

**March of Dimes**
Siobhan Dolan, MD, MPH
Professor and Vice-Chair for Research
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Albert Einstein College of Medicine and Montefiore Medical Center

**National Society of Genetic Counselors**
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Senior Genetic Counselor Division of Medical Genetics
UPMC Children's Hospital of Pittsburgh

**Society for Inherited Metabolic Disorders**
Georgianne Arnold, MD
Clinical Research Director, Division of Medical Genetics
UPMC Children's Hospital of Pittsburgh

# I. Administrative Business – May 13, 2021

## A. Welcome and Roll Call

***Cynthia M. Powell, MD, FACMG, FAAP***
Committee Chair

Dr. Powell welcomed participants to the second meeting in 2021 of the Advisory Committee on Heritable Disorders in Newborns and Children (ACHDNC). Dr. Powell then conducted the roll call. The Committee members in attendance were:

- Dr. Kamila Mistry
- Dr. Mei Baker
- Dr. Jane DeLuca
- Dr. Scott Grosse
- Dr. Carla Cuthbert
- Dr. Kellie Kelm
- Dr. Michael Warren
- Dr. Shawn McCandless
- Dr. Melissa Parisi
- Dr. Cynthia Powell
- Ms. Annamarie Saarinen
- Dr. Scott Shone

Organizational representatives in attendance were:

- American Academy of Family Physicians, Dr. Robert Ostrander
- American Academy of Pediatrics, Dr. Deborah Freedenberg
- American College of Medical Genetics and Genomics, Dr. Max Muenke
- Association of Maternal and Child Health Programs, Dr. Jed Miller
- Association of Public Health Laboratories, Dr. Susan Tanksley
- Association of State and Territorial Health Officials, Dr. Christopher Kus
- Association of Women's Health, Obstetric & Neonatal Nurses, Dr. Shakira Henderson
- Child Neurology Society, Dr. Jennifer Kwon
- Department of Defense, Dr. Jacob Hogue
- Genetic Alliance, Ms. Natasha Bonhomme
- March of Dimes, Dr. Siobhan Dolan
- National Society of Genetic Counselors, Ms. Cate Walsh Vockley
- Society for Inherited Metabolic Disorders, Dr. Georgianne Arnold

## B. Committee Business

***Cynthia M. Powell, MD, FACMG, FAAP***
Committee Chair

Dr. Powell noted that in April, HRSA received a nomination for guanidinoacetate methyltransferase (GAMT) deficiency that had been first nominated in 2015. The nomination is now in the process of undergoing an initial review for completeness. Dr. Powell will keep the Committee updated on next steps.

Dr. Powell informed the Committee that she has convened a workgroup to synthesize and summarize updates to the Committee's evidence review process. She acknowledged the members of the work group and thanked them for agreeing to serve. Dr. Powell reminded the Committee that updates to the nomination and evidence review processes will not go into effect until the calendar year 2022.

## C. Vote on February 2021 Meeting Minutes

Advisory Committee members received a draft of the minutes from the February 2021 meeting in the briefing book for this meeting. Dr. Powell asked for additions or corrections; none were suggested. Dr. Brothers moved to approve the minutes. Dr. Shone seconded the motion. The roll was taken, and all members present approved.

# II. Continuity of Operations Planning (COOP) in Newborn Screening: Lessons and Needs Learned from the Covid-19 Pandemic

***Cynthia M. Powell, MD, FACMG, FAAP***
Committee Chair

Dr. Powell introduced the discussion by noting the substantial impact that the COVID-19 pandemic has had on newborn screening (NBS), including critical supply shortages and staff reassignments. At the February 2021 ACHDNC meeting the Committee heard from a panel of state representatives on Continuity of Operations Planning (COOP) and COVID-19. During that session there was insufficient time for discussion and Dr. Powell invited the panel to the May 2021 meeting.

Dr. Powell re-introduced the panel: Dr. Susan Tanksley, Dr. Scott Shone, Dr. Michele Caggana, and Joyal Meyer and asked the group to describe the biggest challenges facing NBS labs as the follow-up to the February meeting.

Dr. Tanksley replied that supply shortages were the most significant challenges, particularly for pipette tips and some reagents. Dr. Caggana agreed and added that workforce attrition was a challenge and indicated that COOP plans must be continuously updated. Dr. Powell asked if there were challenges regarding turnaround times. Dr. Caggana replied that there were some delays. Ms. Meyer reported no delays in North Dakota despite

outsourcing lab services to Iowa. Dr. Shone echoed Drs. Tanksley and Caggana regarding the supply chain shortages and noted that the Department of Health and Human Services (HHS), partnered with stakeholders including APHL to develop a prioritization letter that has already helped state public health laboratories obtain necessary NBS supplies.

## Discussion

- An organizational representative highlighted that many components of the NBS system have their own COOP plans, but the challenge is to integrate or coordinate these plans so that during times of disaster there are not conflicting plans. The representative noted this would benefit NBS because it would make it a more standard consideration in other COOP plans, such as for hospitals or pediatrician offices.
- A Committee member asked whether the pandemic has highlighted the need for regional cooperation or regionalization of COOP plans, and what this integration would look like from the perspective of laboratory directors. Dr. Shone responded that regionalization can be helpful, but it must account for the fact that an emergency situation, such as a weather event, can impact multiple states, which can limit the number of nearby partners that are able to offer backup services. To this end, regionalization could help identify contingency measures if multiple states require assistance for NBS at the same time. Dr. Shone also noted that even if regionalization of COOP doesn't solve all issues, it still moves towards more integrated systems, which should benefit NBS. Ms. Meyer underscored the importance of maintaining flexibility in a regional COOP, noting that Iowa handles NBS for both North Dakota, South Dakota and Alaska (even though it is outside of the immediate region.)
- An organizational representative asked if the National Newborn Screening Contingency Plan (CONPLAN) includes contingencies for states that distribute formula. Dr. Shone replied that the national plan describes the need to continue these services, but questions remain over whether the designated organizations or agencies know that they have been tasked with these duties in COOP operations. Ms. Meyer stated that North Dakota does provide formula in case of emergency, though the state makes direct orders to family's houses so that distribution is simpler.
- An organizational representative asked how treatments fit into COOP planning; for example, coordinating treatment during an emergency just like formula distribution is coordinated. Dr. Tanksley responded that this is a key piece missing from COOP framework, and most of the necessary conversations around this topic have not yet occurred. Dr. Caggana replied that, as an example, at the start of the COVID-19 pandemic in March of 2020, in response to many pediatrician and specialty care offices closing, New York put together a document of telehealth solutions within NBS. Though physical examinations were not possible, these solutions proved successful because parents were still able to access genetic counseling and important information from medical professionals. Dr. Caggana noted that she hopes these telehealth solutions remain in place after the pandemic because it provides more frequent and easier access for parents, which can help in reducing stress for them.
- An organizational representative commented that the Committee should highlight the need to not only integrate vertically between doctors' offices and hospitals but also integrate horizontally between public health systems. The representative expressed fear that without integration and defined contingencies or operating standards, there will be unnecessary hoarding of valuable supplies. Dr. Shone agreed with this point, noting that the sharing of supplies is currently based on good faith, and that may not always exist.

- A Committee member asked if there were any lessons learned during the pandemic that will positively impact future operations, outside of an emergency situation. Dr. Tanksley responded that from complying with social distancing requirements and focusing on keeping her employees safe, they discovered efficiencies for some of their processes. She also complimented the increasing role of telehealth and telework in helping free up needed workspace in the lab. Dr. Caggana responded that telework has also helped her lab because it required them to establish remote connections to equipment, which allows for quicker and more streamlined reporting of critical results because, for example, results can now be checked after hours.

# III. Association of Maternal & Child Health Programs (AMCHP): Coronavirus Aid, Relief, and Economic Security (CARES) Act – Newborn Screening Telehealth Activities

## A. AMCHP Advisory Committee on Heritable Disorders in Newborns and Children Briefing

***Sabra Anckner, RN, MSN***
Special Project Director, Association of Maternal & Child Health Programs

Ms. Anckner gave a brief overview of AMCHP and the telehealth project. She also presented the organization's anti-racism commitment. "We cannot fully achieve our goals unless we acknowledge that racism is a public health crisis and directly impacts the health outcomes of our communities and those we serve." The three funded areas of the CARES Act project included Title V and Children & Youth with Special Health Care Needs, Maternal, Infant, & Early Childhood Home Visiting, and NBS. Their task was to support telehealth use in MCH public health systems as part of the pandemic response.

Ms. Anckner described the project structure. The steering group included national subject matter expert partners. She described their definition of telehealth and described the 21 Request for Proposal (RFP) awardees, all of whom received up to $100K per jurisdiction. Telehealth is defined as the remote delivery of health care services and clinical information via telecommunications technology. Telehealth can be synchronous, such as a video call with a peer support group, or asynchronous, such as a "store and forward" consultation between providers. Telehealth is not solely technology-based, such as health information technology or services that support telework for agencies, but not telehealth for families. The RFP awardees were located across 18 states, three territories, two tribal nations, and one freely associated state (Micronesia). The NBS focused projects were in Connecticut, Puerto Rico, and Alaska (receiving a partial award). The NBS-associated projects were in Iowa and a Hawaii-led project with California, Idaho, and Washington.

## B. Supporting Families Through Telehealth

***Natasha F. Bonhomme***
Founder, Expecting Health

Ms. Bonhomme noted that her project was designed to "meet parents where they were," particularly families experiencing high levels of stress, those with uncertain/unstable employment, conflicting perspectives on the risk of accessing health care, and those caring for children *and* older parents. She described the challenges associated with balancing benefits and concerns around telehealth and noted that it is essential to protect medically sensitive children while navigating options for other children and family members. Her group limited focus to parents' needs and continued disparities in resource access.

Ms. Bonhomme described telehealth additions to the online COVID-19 module. She described telehealth resources from other supported programs, discussed key questions asked during follow-up appointments, and mentioned quality telehealth appointments. Her group created a virtual triage platform regarding NBS called Family Information on Newborns (FIN). Ms. Bonhomme described the details and announced its launch in May 2021. Ms. Bonhomme described grantee round tables focused on short- and long-term strategies for material development. She emphasized the need to analyze impacts and outcomes over time. Finally, Ms. Bonhomme stressed the importance of participating in and encouraging ongoing discussions and that it is never too late to answer lingering questions.

## C. Implementation of a Telehealth System in the PR Newborn Screening Program

***Sulay Rivera-Sanchez, MS, PhD***
Assistant Professor of Pediatrics, University of Puerto Rico

Dr. Rivera-Sanchez described the PRNBS program that has been in service for over 30 years for 35 core conditions. She described how they dealt with emergencies in the previous four years. These included Hurricanes Irma and Maria in 2017, an earthquake in 2020, and COVID-19. She described their telehealth-based follow-up project and how it can be extended beyond the context of emergencies to meliorate inequities, including teaching families how to access telehealth. The follow-up division coordinates taking repeat samples, referrals to specialists, coordination of confirmatory testing and other telehealth services (nutrition, social work, access to specialized formula, etc.), genetic counseling, and education of families and health care professionals. The program includes a clinic with a pediatrician that collaborates with hematology, endocrinology, immunology, and pulmonary clinics.

Dr. Rivera-Sanchez mentioned that their telehealth project goals included establishing the first telehealth program in PR to provide prompt follow-up for patients identified by the NBS program and obtain essential equipment for telehealth. The PR NBS telehealth system will facilitate distant health care services by allowing the following: 1) clinical evaluation of patients by the pediatrician from the Children and Youth with Special Health Care Needs program; 2) clinical evaluation by specialists serving as clinical consultants to the PR NBS program; 3) clinical evaluation with specialists from the contiguous U.S. involved in the follow-up of any case identified by the NBS; 4) clinical evaluation of patients with socio-economic disadvantages; 5) clinical evaluation of patients during an emergency, and 6) collaborations with other medical centers in PR. By implementing a telehealth program at the PR NBS laboratory, the experience of families will improve by reducing waiting time for appointments, obtaining final diagnoses promptly, and providing opportunities to access multidisciplinary health care. The future

goals of the program are to provide internet options to families and collaborate with pediatric centers throughout PR to provide telehealth services.

## D. Newborn Bloodspot Screening

***Ginger Nichols, MS, LCGC***
Genetic Counselor, Connecticut Newborn Diagnosis & Treatment Network

Ms. Nichols described the CT NBS telehealth system. The two parts of the system include the CT NBS program and the CT Newborn Diagnosis & Treatment Network, both funded by the state Department of Health.The proposed project goals were to develop a telehealth system to increase access to health care and support families in the pre-diagnosis phase. They also aimed to incorporate the family voice. To do this, they proposed to build a family advisory group in partnership with Parents Available to Help (PATH) CT. The primary outcome was expanding access, increasing equity, decreasing pre-diagnosis phase time, and reducing the stress associated with these episodes (time off work, childcare, etc.). Ms. Nichols' group performed genetic counseling virtually starting March 2021. There are now integration capabilities using the Epic electronic health record application. They partnered with Health Equity Solutions, Inc. to produce culturally appropriate outreach and educational materials for families. Ms. Nichols identified difficulties with outpatient blood draws and urine samples, and the laboratory experience in general, often because of challenges obtaining samples from newborns. Outpatient laboratories designated as centers of pediatric excellence are being identified that specialize in newborn blood draws and urine samples to reduce these frustrations.

## Discussion

- An organizational representative provided his personal experience with telehealth and conveyed how it enhanced the patient and family experience. The representative conducted telehealth visits from a medical office with cross-state specialists, which gave access to outside expertise, while providing the comfort and medical resources of a doctor's office. The representative noted, however, that Medicaid and other insurance companies are beginning to reinstate limitations on cross-state telehealth visits in some states. There is a financial and administrative burden to constantly applying for new state licenses. The representative suggested that the Committee should advocate for these barriers to be eliminated.
- A Committee member echoed the organizational representative's comment and stressed that many disorders have limited specialists available across few locations so telehealth is the only practical way that families can access necessary medical resources. The Committee member also highlighted the expanding capabilities of telehealth, including remote monitoring of electronic devices that can send vital data to the medical provider.
- Sabra Anckner agreed about the positive impacts of remote monitoring and mentioned several current examples. In Nevada, a partnership with University of Nevada Las Vegas is using Bluetooth-enabled blood pressure cuffs, pulse oximetry monitors, and glucometers to monitor high-risk Obstetric patients. Kentucky has a similar project using pulse oximetry monitoring. In Wisconsin, home visitors are facilitating remote monitoring of patients located far distances from a pediatric audiologist using tympanometry tools and audiometers to measure hearing loss.

# IV. Public Comment: General

## A. Dr. Matthew Ellinwood

Dr. Ellinwood (Chief Information Officer with the National MPS Society) stated that mucoplysaccharidosis II (MPS II) (Hunter syndrome) diagnosis and treatment has matured to meriting inclusion in NBS. Dr. Ellinwood stressed the need to use science to develop early diagnosis and treatment. He stressed that these treatments could make substantial differences in the lives of children and families with MPS. Dr. Ellinwood asked that the Committee advance the nomination of MPS II to evidence review. He acknowledged that more work needs to be done and adding MPS II to the Recommended Uniform Screening Panel (RUSP) is necessary.

## B. Dr. Joseph Muenzer

Dr. Muenzer, professor of pediatrics and genetics at the University of North Carolina School of Medicine, reviewed the biochemistry of MPS II, an X-linked recessive disorder with varying levels of severity. He highlighted that patients appear normal at birth and often do not develop symptoms, including neurological (spinal cord compression, hearing loss) and cognitive disorders that appear after two years of age. Dr. Muenzer explained that individuals with MPS II have reduced life expectancy, particularly because of airway and cardiac issues. He argued that therapy under three years of age could limit the extent of the disease because once symptoms manifest, progression can be slowed but not reversed. Finally, he urged the Committee to advance the nomination to evidence review.

## C. Dr. Barbara Burton

Dr. Burton (professor of pediatrics at Northwestern University) noted that screening for MPS II has been ongoing in Illinois since December 2017. The state laboratory performs testing on dried blood spots, and screen-positive patients are referred to diagnostic testing. The program identified six positive cases out of 44 referred for diagnostic testing. The incidence was 1 in 81,500, which is higher than the reported incidence. Of the six infants, four were started on enzyme replacement therapy at four–six weeks of age, and all are doing well. One patient with a severe mutation is developing normally. Dr. Burton personally observed the benefit of early treatment. She noted that early pre-symptomatic treatment is preferable to late diagnosis and treatment in the context of identification because of affected siblings. Dr. Burton stated that she believes there is ample evidence to suggest that MPS II screening should be advanced to full evidence review for inclusion on the RUSP.

## D. Mike Hu

Mr. Hu described his personal experience of seeing the benefits of early detection and treatment of MPS II in his children. Mr. Hu represents the advocacy group Project Guardian. His two older boys were diagnosed. Sadly, the older child is transitioning to palliative care, whereas the younger son receives treatment due to his early diagnosis. Early diagnosis led to his youngest son being eligible to participate in a new promising clinical trial. Mr. Hu personally attests to the benefits of early diagnosis and treatment. Several genetic diseases can be diagnosed and treated early but are not on the RUSP. Mr. Hu mentioned several of the barriers to inclusion on

the RUSP. He pointed out that if MPS II is eventually added to the RUSP it will aid in gathering evidence for early diagnosis and treatment. Mr. Hu suggested provisional approval as an intermediate step before full approval.

## E. Cory Blain

Ms. Blain described the story of her two children's diagnoses. She lives in Michigan with her family. Michigan tests for MPS I but not MPS II. A pediatrician noted some features in one child that led to a referral to a geneticist. Her second son was tested and was found to be positive at birth. Both children are experiencing neurological, cognitive, and functional disorders and are enrolled in clinical trials. Both children require substantial services and devices to function. Ms. Blain mentioned that NBS might have facilitated the diagnoses rather than waiting three years to initiate treatment.

## F. Niki Armstrong

Ms. Armstrong discussed the case for NBS screening for Duchenne muscular dystrophy (DMD). She noted that the pilot program in New York identified four boys with DMD and one female carrier out of 24,000 infants screened using a Food and Drug Administration approved CKMM assay. Families with DMD are followed in health systems associated with multidisciplinary neuromuscular clinics. Ms. Armstrong announced that her group is initiating developing a RUSP nomination package for DMD.

## G. Dylan Simon

Mr. Simon (EveryLife Foundation for Rare Diseases) discussed state-level legislative efforts to pass the Newborn Screening Saves Lives Act. He discussed efforts to increase funding and awareness at the federal level as well. Mr. Simon indicated that EveryLife Foundation will continue to advocate for decreasing the timeline between when a condition is added to the RUSP and implementation at the state level: the RUSP Alignment legislation works to ensure that a state must screen for all RUSP conditions within a specified amount of time and that there is a long-term funding source for NBS programs to facilitate the implementation of new conditions.

## H. Dean Suhr

Mr. Suhr (MLD Foundation) reviewed the recent history of MLD (metachromatic leukodystrophy), particularly their work developing screening tests for MLD in 2007. Assays for MLD are available, as are studies of treatments (gene therapy, particularly in the European Union, and a new trial in New York). Mr. Suhr highlighted that MLD and many other genetic disorders are likely to come before the Committee soon. He appreciates that this circumstance may present challenges to the Committee and offered the help of his organization. Mr. Suhr highlighted issues with follow-up, particularly loss to follow-up and very long-term follow-up. Finally, Mr. Suhr cautioned that the cost associated with treatments like gene therapy is a major concern but urged the Committee not to let cost of treatment influence the decision for whether or not to include a condition on the RUSP.

# V. Mucopolysaccharidosis II (MPS II) Nomination Summary

Dr. Powell announced that the Committee has received a nomination for MPS II for consideration to add to the Recommended Uniform Screening Panel. The first step was to conduct the initial review for completeness, after determining that the nomination package had all the required components, the Nomination and Prioritization workgroup reviews the information and provides the Committee with a summary and recommendation as to whether the condition ought to move forward to full evidence review.

# VI. Nomination and Prioritization Work Group Findings

***Scott M. Shone, PhD, HCLD(ABB)***
Director, North Carolina State Laboratory of Public Health

Dr. Shone presented the Nomination and Prioritization (N&P) workgroup recommendation to the Committee for MPS II. The nominators for the proposal were Terri Klein, president of the National MPS Society, and Dr. Ellinwood, Chief Scientific Officer of the MPS Society. Dr. Shone also mentioned the several co-sponsors of the nomination.

He reviewed the submitted package, beginning with a review of the genetics, epidemiology, and clinical presentations of MPS II. It is a progressive lysosomal storage disease that affects multiple organs. The onset ranges from ~1 year of age to early adolescence. There are attenuated and severe phenotypes. The latter includes profound cognitive impairments and developmental regression that can be severe, culminating with death in the second decade of life. The former is characterized by somatic but no cognitive involvement with survival into adulthood with some premature mortality. MPS II is X-linked, caused by deficiency of iduronate-2-sulfatase, leading to accumulation of dermatan sulfate and heparan sulfate. The true incidence in the U.S. is unknown, although estimates place it at 0.13-2.16 per 100,000. Females with MPS II are rare, but the phenotype tends to be severe when they do occur. There are more than 400 disease-causing variants.

Core requirements for nomination include 1) validation of the laboratory test, 2) widely available confirmatory testing with a sensitive and specific diagnostic test, and 3) a prospective population-based pilot study.

The key questions and the workgroup's answers for MPS II were as follows:

- Is the nominated condition medically serious? Answer: **Yes**
- Is the case definition and the spectrum of the condition well described to help predict the phenotypic range of those children who will be identified based on population-based screening? Answer: **Unclear**
- Are their prospective pilot data from population-based assessments available for this disorder? Answer: **Yes**
- Does the screening test have established analytic validity? Answer: **Yes**

- Are the characteristics of the screening test reasonable for the NBS system (including among other things a low rate of false negatives)? Answer: **Yes**
- Is there a widely available and CLIA or FDA approved confirmatory test/diagnostic process? Answer: **Yes**
- Do the results have clinical utility? If the spectrum of disease is broad, will the screening or diagnostic process benefit the patient, particularly if treatment is onerous or risky? Answer: **Unclear**
- Are there defined treatment protocols, FDA-approved medications (if applicable) and is treatment available? Answer: **Yes**

The workgroup recommended that the Committee vote yes on moving forward the MPS II nomination for full evidence review.

### Questions

- An organizational representative asked if there is any clarity around early vs late onset in the positive patient groups. Additionally, the representative wondered if any patients were of indeterminate status. Dr. Shone responded that the studies do not provide details for timing of onset for the condition. Both Dr. Shone and the other Committee member highlighted that a comprehensive literature review, which will be completed if the Committee votes to advance to a full evidence review, will be key to answering these questions.
- A Committee member asked for clarification regarding the severity of phenotype in female patients, noting that severe phenotypes in females are atypical for X-linked disorders. Dr. Shone mentioned that this finding was derived from the literature that was provided to the workgroup. Dr. Powell responded that she believed that some patients had other X chromosome abnormalities (such as Turner syndrome). Another Committee member replied that the severe presentation in females was observed for unclear reasons. However, the workgroup did not do an in-depth literature review; this will occur in the full evidence review process.

# VII. Committee Discussion

Dr. Brothers moved for a vote to recommend that MPS II advance to full evidence review; Ms. Saarinen seconded the motion. With no recusals or abstentions and one member absent, the roll was called, and the motion passed unanimously.

# VIII. End of Day One

Dr. Powell adjourned the meeting for the day.

# IX. Administrative Business – May 14, 2021

## A. Welcome and Roll Call

Dr. Powell welcomed participants to Day 2 of the second meeting in 2021 of the Advisory Committee on Heritable Disorders in Newborns and Children.

Dr. Powell then conducted the roll call. The Committee members in attendance were:

- Dr. Kamila Mistry
- Dr. Mei Baker
- Dr. Jane DeLuca
- Dr. Jeffrey Brosco
- Dr. Kyle Brothers
- Dr. Carla Cuthbert
- Dr. Kellie Kelm
- Ms. Joan Scott
- Dr. Melissa Parisi
- Dr. Cynthia Powell
- Ms. Annamarie Saarinen
- Dr. Scott Shone

Organizational representatives in attendance were:

- American Academy of Family Physicians, Dr. Robert Ostrander
- American Academy of Pediatrics, Dr. Deborah Freedenberg
- American College of Medical Genetics and Genomics, Dr. Max Muenke
- Association of Maternal and Child Health Programs, Dr. Jed Miller
- Association of Public Health Laboratories, Dr. Susan Tanksley
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- Society for Inherited Metabolic Disorders, Dr. Georgianne Arnold

# X. Overview of the National Survey of Children's Health

## A. National Survey of Children's Health Overview

***Reem M. Ghandour, DrPh, MPA***
Director, Division of Epidemiology, HRSA

Dr. Ghandour provided an overview of the National Survey of Children's Health (NSCH). It is funded and directed by HRSA and co-sponsored by other agencies including the Centers for Disease Control and

Prevention (CDC), and the U.S. Department of Agriculture and is administered by the U.S. Census Bureau. The survey is conducted annually, using a cross-sectional, address-based survey that respondents can complete via the web or in hard copy. It is designed to collect information on children's health and well-being aged 0–17 years related to health care, family, and community-level factors influencing health.

There are eight content areas broken out across three age groups. There are also questions regarding the adequacy of insurance coverage and the impact of children with special health needs, including genetic disorders. The questions are primarily driven by Title V performance; outcome measures; Healthy People 2030 objectives; CDC investments in Attention-deficient hyperactivity disorder, autism spectrum disorder, and developmental conditions; MCHB investments in early childhood; and children with special needs. She noted that various entities outside government are using these data to manage policies.

Dr. Ghandour described how to access the survey's data on the internet, including the raw Census Bureau data. Finally, Dr. Ghandour discussed several innovations at NSCH, including new oversampling items and survey question areas added in 2021 and for 2022.

## B. National Survey of Children's Health Key Estimates

***Julie Donney, PhD, MPH***
Public Health Analyst, HRSA

Dr. Donney noted that genetic and inherited disorders ranked ninth of 12 (at 3.8%) among current or lifelong health conditions in children aged 0–17. Questions about NBS were added to questions regarding blood and other genetic disorders in 2018. She noted that 80% of genetic/inherited conditions were identified in some manner other than NBS, whereas NBS identified two-thirds of blood disorders. In general, children with genetic conditions were more severely affected than those with blood disorders. Parents of children with cystic fibrosis experienced dramatically high rates of reporting unmet needs and frustration regarding obtaining services.

## Discussion

- A Committee member complimented that information was given about NBS relative to poverty and asked if analysis has been performed to determine whether certain conditions are more prevalent in certain populations, or whether there is evidence that NBS helps reduce inequity in health care. Dr. Donney and Dr. Ghandour responded that, to their knowledge, this analysis has not been performed.
- A Committee member asked about the process of 'retiring' or rotating questions from the survey after new questions are identified. Dr. Ghandour responded that they are conscious of time constraints and how a lengthier survey can mean less respondents. To date, few questions have been removed from the survey, but there is a robust process for weighing content with Bureau priorities and whenever possible, they look to find efficiencies to reduce the amount of time needed to complete the survey.

- A Committee member asked if, aside from race and ethnicity targets, there are reasons that states choose to oversample and how the process works. Dr. Ghandour responded that states oversample in response to state priorities. For example, some states oversample populations to focus on children with special healthcare needs while others oversample populations to focus on early learning or early childhood.
- A Committee member asked for clarification about data from NBS versus responses on the survey. Dr. Ghandour responded that the survey is self-administered by parents so there is possible variation from other health results because there is no opportunity to follow up or ask probing questions.
- An organizational representative asked if write-in answers for 'other conditions' are analyzed further or if they remain under 'other conditions" for reporting. Dr. Ghandour responded that the data is available for analysis, and can be requested, but her team has not looked at the write-in answers.
- An organizational representative asked if there are any questions about prenatal diagnosis given the increasing role of prenatal screening. Dr. Ghandour responded that her team is considering adding those questions.
- An organizational representative highlighted that while NBS is universally available, prenatal screening can be limited by income so it is possible that some results from the survey that credit NBS in identifying a condition, could only be because prenatal screening was not accessible.
- An organizational representative asked about the content of the COVID-19 questions. Dr. Ghandour answered that, among other things, the questions focus on child care disruptions, missed preventative care, and the reasons for missed preventative care.
- A Committee member asked if the survey team digs deeper into answers about unmet needs for a condition. Dr. Ghandour agreed about the importance of analyzing these results, especially looking at the concept of expected services for each income group. She noted that additional funding would be needed to perform this in-depth analysis. Another Committee member commented that other surveys have looked at this topic.
- The Committee is encouraged to consider ways that these survey data could be mined to obtain information about long-term outcomes of NBS.

# XI. Public Comment: Review of the Evidence Review Process

## A. Elisa Seeger

Ms. Seeger stated that she hoped the review and implementation of an updated evidence review process continues to be conducted in a manner that is transparent, inclusive, and timely. She also recommended the creation of educational materials for all NBS stakeholders utilizing a multi-stakeholder working group.

# XII. Newborn Screening Workforce: Short- And Long-Term Follow-Up

## A. Introduction

***Cynthia M. Powell, MD, FACMG, FAAP***
Committee Chair

Dr. Powell noted that the Government Accountability Office (GAO) developed a report on the medical genetics workforce. The American College of Medical Genetics and Genomics (ACMG) and the American Board of Medical Genetics and Genomics (ABMGG) partnered to survey the field of board-certified/eligible geneticists in the U.S. to provide information and data to the GAO. The National Society of Genetic Counselors (NSGC) and the American Board of Genetic Counseling provided data to the GAO, who interviewed officials from HRSA, the National Institutes of Health, and the Bureau of Labor and Statistics. They also interviewed two of the seven HRSA-supported Regional Genetics Networks.

The report found seven genetic counselors per 500,000 and 2 medical geneticists per 500,000. The numbers of both vary widely across states. Both groups practice primarily in hospitals. Presenters today will share more details about Medical Geneticists, now and looking to the future; Genetic Counselors, role and engagement in the NBS system; Neurologists, innovative approaches to addressing challenges and gaps and will look to other specialties for examples of successful engagement of providers to improve access to services: Sickle Cell Disease—Advanced Practice Provider Training.

***Miriam G. Blitzer, PhD, FACMG***
CEO, American Board of Medical Genetics and Genomics

Dr. Blitzer opened by reading the ABMGG mission statement "The mission of the ABMGG is to serve the public and medical profession by establishing professional certification standards and promoting lifelong learning as well as excellence in medical genetics and genomics." Dr. Blitzer discussed the principal functions of the ABMGG (setting standards, developing and administering examinations, and setting standards for continuing certification).

There are now sub-specialties within medical genetics, including clinical genetics and genomics, medical biochemical genetics, clinical biochemical genetics (laboratories), and laboratory genetics and genomics (laboratories).

The residencies are a two-year accredited residency or a combined four-year residency with pediatrics, internal medicine, maternal-fetal medicine, reproductive endocrinology, and infertility. The latter has helped increase the size of the workforce. There are currently 46 accredited residency programs and 41 combined residency programs. The numbers of certified clinical geneticists are growing. Currently, 1240 certified clinical geneticists are practicing. Dr. Blitzer also discussed the breakdown of clinical geneticists by race, gender, ethnicity, and age. The specialty is majority white and female.

The distribution of providers is not uniform. Practitioners are concentrated in California, Texas, and major U.S. states. Wyoming has no practitioners. Many states have one or two. The 2019 workforce study concluded that there is a gap between genetics services needed and capacity. A concerted effort is required to increase the number of clinical geneticists and enhance interdisciplinary teamwork to meet growing patient needs.

Dr. Blitzer observed that telehealth has helped mitigate some geographical discrepancies.

## B. Genetic Counselors and Newborn Screening: Roles, Activities and Future Challenges

***Cate Walsh Vockley, MS, LCGC***
National Society of Genetic Counselors

Ms. Walsh Vockley noted that the number of genetic counselors (GCs) involved in NBS is unclear. The 2020 NSGC professional status survey listed <10 GCs who consider NBS to be their primary work setting and < 10 who work in public health. She noted that these were likely to represent undercounts, likely because many practitioners do some NBS work. Many positions are not 'GC' positions in state or federal classification systems. Ms. Walsh Vockley noted that many individuals trained as GCs fill several roles within and related to NBS programs and follow-up.

She noted a need for educators for families, professionals, and the existing NBS workforce. There is a need for knowledgeable informants to work with families 'in waiting'—depending on state screening protocols. Families may have to wait for molecular results and may have many questions while waiting. The addition of Pompe and MPS I have already significantly increased the need for individuals knowledgeable about the disorders and the molecular genetics/genomics of the conditions, which is likely to continue. Ms. Walsh Vockley also observed that it is challenging to manage cascade testing as new conditions with later onset variants are added (e.g., Pompe, ALD, spinal muscular atrophy [SMA], and others). Another challenge is a need for diversity of providers to serve a complex and diverse population seeking care, including diversity of race, ethnicity, language, and gender. Finally, there is a challenge for individuals knowledgeable about clinical trials for conditions on the RUSP.

Ms. Walsh Vockley noted that there has been a growing need for competitive compensation commensurate with training, experience, and skill, both in public health and clinical care. There is currently a lack of defined positions for GCs in public health. There is a need for entry-level and retention considerations and need for promotion opportunities (the so-called 'job ladder'). She also noted a lack of defined civil service positions for GCs. Programs are under-resourced, and there is a limited number of MD-level geneticists to perform follow-up work.

Ms. Walsh Vockley reviewed compensation for GCs and noted that her data might not capture the GC NBS workforce, and the sample size is small. Nevertheless, GCs in NBS and public health earn roughly 16% less than those in other settings.

Regarding present and future solutions for NBS, Ms. Walsh Vockley noted a need for more educators to provide prenatal NBS education for families, discuss screening throughout pregnancy, and integrate NBS education in prenatal GC setting. She mentioned innovative solutions such as chatbots, cell phone applications, and videos that have been developed or are in development. Another solution would be GCs providing 'molecular 101' training for the existing NBS workforce and follow-up staff. The state of Hawaii offers parent fact sheets and videos made by GCs in conjunction with specialty care providers.

GCs are also being asked to be advocates for families. Not all clinics have a nurse or social worker; GCs often fill multiple roles, including time-consuming cascade screening and care coordination. They are also in a dialogue with the NBS system team to decrease false positives. Finally, they also coordinate the delivery of quality clinical follow-up data to state programs. Ms. Walsh Vockley mentioned that some GC training programs are adding curricular items to recognize that nurses, social workers, and epidemiologists may be in short supply. She also mentioned the efforts to increase diversity.

Regarding compensation, there are ongoing efforts to increase funding to GC services through the Centers for Medicare & Medicaid.

## C. Child Neurologists and Newborn Screening

**Jennifer Kwon, MD, MPH**
Representative, Child Neurology Society

Dr. Kwon briefly discussed the subspecialty of child neurology and the Child Neurology Society. She discussed workforce challenges to maintain pace with discoveries and treatments. She also discussed innovative solutions to addressing shortages, challenges, and gaps, including the COVID-19 response, telehealth guidance, and improving recruitment.

She noted that child neurologists undergo a five-year post-graduate residency, two years in pediatrics, one-year in general adult neurology, two years in pediatric neurology, and additional years in subspecialty training (epilepsy, neurophysiology, neuromuscular disorders, movement disorders, and others). Dr. Kwon noted that over 70 university-based child neurology training programs currently enroll over 150 candidates per year in the U.S. and Canada. Many follow their patients into adulthood.

Of these, the numbers are growing but not maintaining pace with demand. The workforce is also apparently aging. Interest in child neurology is not increasing at the desired pace. Compensation has not kept pace with adult neurology.

The recent decade has seen dramatic growth in knowledge and treatments. There are increasing opportunities for subspecialty training. There is a particular need to update education and training continually. Dr. Kwon noted that, typically, child neurologists work in multidisciplinary settings. However, good care tends to be provided in urban areas because of necessary resources, although this imposes stresses on families.

Telehealth has been utilized in child neurology for many years; however, there have been barriers to implementation that did not lift until the COVID-19 crisis. Dr. Kwon noted that many obstacles to using

telehealth are returning now that COVID related flexibilities are ending. To circumvent these problems, some practitioners have been traveling, although only within states. She also stated that child neurologists have helped develop clinical care guidelines for rare conditions.

Dr. Kwon spoke about state screening for SMA. Child neurologists are the primary specialists who see these infants. These specialists led efforts to define appropriate natural history studies. Having seen the successes with SMA, child neurologists are energized to be involved in screening for other neuromuscular disorders (e.g., Pompe disease) and leukodystrophies (e.g., X-lined leukodystrophy).

## D. Increasing Access to Expertise in Sickle Cell Disease Care by Training Advanced Practice Providers

***Julie Kanter, MD***
Comprehensive Sickle Cell Center

Dr. Kanter began her presentation on care of sickle cell disease (SCD) patients by discussing goals. The goal is to increase access to high-quality care for people with SCD. Some barriers include provider lack of interest, lack of time, and insufficient reimbursement. An attempted solution is to mentor primary care providers (PCPs). Efforts to train PCPs largely failed because they do not fully engage or attract large numbers of interested PCPs.

Another solution is to train advanced practice providers (APPs). The APPs are taught online by expert hematologists using case-based learning and mentoring sessions. There is also an asynchronous component. The goals are to increase access to evidence-based care for SCD patients by training more APPs and embedding them in primary or secondary settings. Dr. Kanter also described the metrics used to measure the success of the program. The program includes six teaching modules and an observership, after which trainees are certified.

***Marsha J. Treadwell, PhD***
Professor, UCSF Department of Pediatrics/Division of Hematology

Dr. Treadwell discussed the evaluation of the new training program. Trainees are assessed for knowledge and competence. She discussed two sites in the Pacific region, one pediatric and the other adult.

A baseline readiness assessment of the pediatric site was conducted that demonstrated the highest ratings for innovation-specific knowledge and skills; compatibility/alignment of the APP project with the institution, and observability of results. The program ranked very strongly for inter-organizational relationships and the relative advantage of APP training as an approach to improving access to quality, evidence-informed care. The areas for improvement involved monitoring how well practice changes were being implemented, returning to previous ways of administering care, and the relative priority of the SCD APP project in the organization. The adult site returned similar results.

Areas of consensus across sites were that the strategy increased access to quality of care. There was some concern about communication within and between health systems. Dr. Treadwell stressed that sites identified the need for broader access to SCD education.

Dr. Treadwell noted that future goals of the program would be to implement individualized pain management plans. Patient voices should be included in these evaluations. She also stressed the importance of continued opportunities for training and SCD care that utilizes telehealth, disseminates education to individuals living with SCD and providers, and delivery of care that addresses social determinants of health, and the impact of structural racism on SCD management.

## Discussion

- A Committee member highlighted that the Committee advocates for solutions and therapies that expand lab testing and follow-up, but as much as these solutions advance the field of NBS, they are dependent on the workforce shortage that was just explained. To that end, it is necessary for the Committee to look at all components of the system, and advocate for an expanded genetic workforce to achieve its goals.
- A Committee member asked Dr. Treadwell to comment on gene therapy, how it relates to education after NBS, and how to promote equitable access to new therapies including gene therapy. Dr. Kanter first responded that there is a need for continued research. First because the optimal gene therapy has not yet been discovered. Having said that, she stressed the importance of communicating hope to families in terms of available therapies for conditions identified by NBS. Dr. Treadwell added that focus on curative therapy had been limited, and quality of life has been neglected, but this can be helped by increasing the genetic counseling workforce.
- A Committee member expressed distress at hearing that barriers to telehealth are returning, such as limits on cross state care. The Committee member asked if there is any pending legislation to foster the continuation of telehealth. Dr. Kwon stated that she could not answer but that Child Neurology Society agrees to relaxing restrictions. However, it can be difficult for national entities to make recommendations on behalf of states. Ms. Walsh Vockley responded that she is unsure how federal legislation may affect state licensure issues.
- An organizational representative suggested addressing workforce issues by observing how the adult medicine community handles patients with complex conditions. The caveat is that complex conditions tend to be common, whereas NBS conditions are relatively rare. The representative asked Dr. Kwon if there were some way to shift some of the work to a primary care provider. Dr. Kwon responded that the solutions are specialized and disease-specific. In some cases, she says the primary care provider can participate as a critical provider (particularly for Pompe disease and X-linked adrenoleukodystrophy). Dr. Kanter noted that the medical home model did not work for SCD patients, most of whom left their medical homes to attend specialty clinics.
- An organizational representative inquired about families who ask specialists to serve as the medical home. The representative specifically asked Dr. Blitzer if there were data on functioning as a medical home with or without routine primary care (e.g., vaccinations). Dr. Blitzer responded that dual specialist geneticists continue to follow their patients as the primary care provider. The board does not survey for these results. Dr. Powell responded that many providers she is aware of also follow patients over the long-term. Dr. Kwon responded that it can be difficult for pediatricians to see patients into their adult years for a variety of reasons. For example, the practitioners in her clinic may be licensed to treat children only. Dr. Kwon personally will attempt to transition her patients to an adult neuromuscular provider. With this in mind, a

team approach is always helpful, and it is important to build lifetime networks for patients, but the teams and networks will often need to change as the patient grows older.

- An organizational representative asked Dr. Blitzer to expand on the vision for the growth of the workforce in genetics. What is the appropriate metric of success, numbers of providers, or time to see a specialist? The representative also asked about diversity metrics. Dr. Blitzer responded that growth primarily means numbers in terms of need. She would like to see 15% growth. Regarding diversity, she commented that recruiting from medical school is problematic because medical genetics is not required in the curriculum. Diversity expansion efforts are also in their infancy.
- An organizational representative asked Ms. Walsh Vockley if there is a role for a genetic counseling assistant to supplement the workforce and increase overall capacity. Ms. Walsh Vockley agreed there is a place for genetic counseling non-professionals to assist in several clinic functions including coordinating appointments and testing. This role requires some training, and overall the system for both genetic counselors and assistants is bound by availability of clinical training sites and the requirements of accreditation.
- A Committee member asked about the role of the Advisory Committee with respect to workforce issues.The Committee member also wondered if there are indeed shortages and who/what determines the need? For example, some sources state that there is no genetic counselor shortage, although there are evident geographic disparities. The Committee member commented that the economic nature of health care is such that availability depends on a local market's ability to support a medical professional. Another Committee member echoed the comment by observing that heavy loan burdens also drive career choices. The Committee member asked if loan-forgiveness might be included in efforts to expand the genetic counseling workforce.
- An organizational representative responded to several of the previous comments, noting first that genetic counseling workforce may be concentrated in one area of a state, while other significant population centers are underserved. Regarding the transition to adult medicine, the representative shared that adult medicine does not have the same wraparound services, so the transitions are 'bumpy.' Complicating this is that some pediatric hospitals have strict age cutoffs for liability and other reasons. Finally, the representative agreed that an incentive system, such as loan forgiveness, would be helpful in expanding the genetic counseling workforce.
- A Committee member highlighted that NBS is a highly integrated system because of all the levels of health care that is touches. The Committee member also stressed the need to consider the upstream and downstream effects of policy.

# XIII. New Business

Dr. Powell asked for new business. Dr. Parisi announced a workshop in June 2021 for gene-targeted therapies. A Committee member asked that a subsequent meeting address emerging issues for the Committee including the anticipated onslaught of future condition nominations.

# XIV. Adjournment

Dr. Powell adjourned the meeting at 1:45 PM.