Newborn Screening Policy Decisions:
Adding Conditions

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Policy decisions about mandated newborn screening should be based on scientific evidence and incorporate expert opinion. At the national level, a systematic evidence review evaluates the benefit of screening for disorders that may be added to the Recommended Uniform Screening Panel, and ultimately considered by individual newborn screening programs. Recent changes in state laws, including in North Carolina, are intended to streamline the decision-making process for newborn screening policy changes.

Newborn screening is widely recognized as a highly successful public health program. For more than 50 years, state health departments have overseen the performance of this critical public health function within their jurisdictions. Although Newborn screening began with relatively inexpensive screening tests for highly treatable conditions with low-cost interventions, states are now having to use more complex algorithms to screen for exceedingly rare disorders, many of which are more difficult to diagnose and treat. Advances in technology, identification of new disease biomarkers, development of novel therapeutics, and the proactive stance of advocates have driven the expansion of newborn screening across the country [1]. Although the Secretary of Health and Human Services' (HHS) Advisory Committee on Heritable Disorders in Newborns and Children (ACHDNC) makes recommendations concerning new disorders at the national level, each state has its own process for the addition of disorders to its mandated newborn screening panel.

Toward a Uniform Screening Panel and System

In the late 1990s/early 2000s, technology became available that permitted the rapid expansion of newborn screening programs; however, no national newborn screening guidance or standards existed. Differences in state resources led to disparities among states' programs, including variations in which conditions were included on mandated panels. An American Academy of Pediatrics (AAP) Newborn Screening Task Force identified social justice issues that arose from these differences and indicated that greater uniformity among programs would benefit the public health system [2]. Subsequently, congress enacted Title 26 of the Children's Health Act of 2000, which supported the creation of the ACHDNC to advise the HHS Secretary on matters concerning newborn screening. This advice includes recommending disorders that should be included on state-mandated newborn screening panels. Although the law was passed in 2000, the ACHDNC was not chartered until February 2003 and held its first meeting on June 7, 2004 [3].

Meanwhile, a March 2003 Government Accountability Office report found that while 50 states and the District of Columbia had laws allowing for or mandating newborn screening, the number of conditions for which states screened varied from four to 36, with 46 states screening for only six disorders [4]. The discrepancies in screening from state to state contributed to significant disparities in services available to newborns based largely on the infant's place of birth. In response, the Maternal and Child Health Bureau of the Health Resources and Services Administration (HRSA) commissioned the American College of Medical Genetics (ACMG) to develop guidelines for state newborn screening programs, including a Recommended Uniform Screening Panel (RUSP) of conditions to include in state newborn screening programs. ACMG convened a Newborn Screening Expert Group that included participants with expertise in various areas of public health, health policy, subspecialty medicine, primary care, law, and ethics [5].

The expert group found that, in addition to the original Wilson-Jungner criteria [6], some states developed their own evaluation processes; however, most used criteria that were difficult to quantify or lacked comparability across conditions. In addition, these state evaluations were inadequate with respect to the handling of conditions that have similar or overlapping biomarkers. The ACMG Newborn Screening Expert Group developed and utilized uniform evidence-based criteria to review 84 conditions for potential inclusion on a RUSP. A total of 29 conditions were considered appropriate for newborn screening because they had a screening test, an efficacious treatment, and adequate

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knowledge of natural history. These 29 disorders comprised a core panel of recommended conditions. Twenty-five additional conditions, which are part of the differential diagnosis of a core panel condition, were recommended as part of a secondary panel [5].

ACHDNC and the RUSP

Most of the early discussions held by the ACHDNC focused on the ACMG review. In September 2005, the ACHDNC formally endorsed the ACMG report and its recommendations [3]. In response, states began implementing changes to their newborn screening programs in accordance with the recommendations. In May 2010, the ACHDNC endorsement was accepted by Secretary of HHS, Kathleen Sebelius, thereby creating the RUSP. The creation of the RUSP was intended to reduce variation in state-mandated screening panels, and by 2011 all 50 states were screening for at least 26 of the 29 core disorders.

While the ACHDNC is charged with providing recommendations to the Secretary of HHS about the entire newborn screening system from education through long-term follow-up, the review of disorders for inclusion on the RUSP is a significant aspect of the committee's work. Individuals or organizations submit nominations for new conditions to HRSA. The nominator must complete a set of forms that includes an overview of the proposed condition, treatment efficacy and availability, characteristics of a screening test with available follow-up confirmatory testing, and data from a prospective population pilot study that includes at least one identified case. If adequate data exists to support a formal evidence review, the nomination is forwarded to the ACHDNC external Condition Review Workgroup (CRWG). The CRWG is an independent scientific body that provides reviews for the ACHDNC using a thorough and rigorous evidence review process by summarizing the available direct and indirect evidence from published and unpublished data regarding the benefits and harms of screening for the nominated condition [7] so that the committee can assign a rating based on the magnitude and certainty of net benefit [8]. Essentially, the review is intended to provide the committee with enough evidence to determine if outcomes for newborns are improved by identification and treatment presymptomatically compared to routine clinical diagnosis.

Since its initial adoption, six disorders have been added to the core panel of the RUSP: severe combined immunodeficiency (SCID) and critical congenital heart disease (CCHD) in 2010, Pompe disease in 2015, mucopolysaccharidosis type I (MPS I) and X-linked adrenoleukodystrophy (X-ALD) in 2016, and spinal muscular atrophy (SMA) in 2018. Currently, all states screen for at least 29 of the recommended conditions.

State by State

While the evidence review process for the RUSP is robust, it does not include all criteria that may be of interest to state programs when evaluating the net benefit to the specific state's population, the state system's readiness for implementation, or the state system's ability to manage the newly identified population of patients. Thus, any new Newborn screening conditions are routinely reconsidered by the state legislature, state board of health, or a state advisory committee similar to the ACHDNC. These critical state-level processes enable consideration of state-specific issues before implementation of new disorders. Unfortunately, these procedures also have the potential to create inefficiencies and recreate some of the disparities the RUSP was originally designed to avoid. For example, in states that require legislative action to make changes to their newborn screening programs, proposals to add new conditions to mandated newborn screening panels compete with other priorities on the state's legislative and budget agenda [9]. This challenge is a serious issue in states with part-time legislatures. Similarly, state advisory committees may also meet on an infrequent basis, thereby delaying decisions on implementation of new disorders.

Like other states, North Carolina has a process for new disorder review and addition to the state's mandated newborn screening panel. Until recently, the process required legislative action to make any changes to the program, including increasing the fee associated with performing the laboratory and follow-up procedures for new disorders. The lengthy bureaucratic process often contributed to delays in the implementation of new conditions in the state.

Changing the Process

In recent years, the newborn screening system has seen lags in adoption of disorders newly added to the RUSP, and implementation of screening for these disorders can take longer. Many of these delays can be attributed to the bureaucratic processes in state governments, and a few states have recently passed laws to help expedite the addition of disorders to their newborn screening panels. In California, legislation was enacted that requires the newborn screening program to implement screening for any new disorder on the RUSP within two years of its addition. While this law expedites the newborn screening expansion process in California, it has also removed the opportunity for local experts to consider state-specific issues before implementation of new disorders. Similarly, recent legislation requires the Florida Department of Health's Genetics and Newborn Screening Advisory Council (GNSAC) to consider any new disorder added to the RUSP within one year of its addition. If the GNSAC recommends addition of the disorder to the state-mandated panel, the Florida newborn screening program must implement screening within 18 months of that recommendation. The Florida legislation sets a timeline for new disorder consideration to reduce delays and the potential for disparities in care for the state's newborns, but also preserves the opportunity for the state's newborn screening experts to participate in the decision-making process for

their state's program.

Ultimately, different processes for adding disorders in states, costs to implement new disorders, competing priorities within a state's public health system for scarce resources, and state-based advocacy efforts to implement disorders prior to evidence review present significant challenges to the harmonization of mandated newborn screening panels across the country. The RUSP is intended to bring uniformity to the process, but, as a state-based public health program, newborn screening will always be controlled by local conditions.

Earlier this year, in response to concerns over delays in implementation of disorders recently added to the RUSP, North Carolina lawmakers enacted legislation [10] that adopted three disorders from the RUSP that had not yet been added to the state's mandated panel: Pompe disease, MPS I, and X-ALD; streamlined the process for adding new disorders to the state-mandated panel in the future, particularly those added to the RUSP; and provided a critical increase in funds for the newborn screening program, including a mechanism for future fee increases as the state's mandated panel expands. While the law was viewed as a potential financial burden, the changes were crucial to support this critical state public health program, ensure the state newborn screening program remains a leader nationally, and that North Carolina's newborns have the opportunity to benefit from recent advances in the field.

Looking Ahead

North Carolina's newborn screening system has a long history of innovation. Public-private partnerships and pioneering scientific and policy research have been hallmarks of North Carolina's success. These activities continue [11], and the use of data to inform decision-making around newborn screening will set up the state's newborns for a healthful future. NCMJ

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