Newborn Screening
Exploring Proposals to Advance Newborn Screening
and Collaborating for Progress
September 23, 2015
Agenda

• Welcome & Introductions – Julia Jenkins, Executive Director

• NBS Overview—Dean Suhr, Newborn Screening Advocate

• Community Congress ... Max Bronstein, Sr. Director, Advocacy & Science Policy

Links

EveryLife Foundation & Program Overview

• Julia Jenkins – Executive Director
  – Jjenkins@EveryLifeFoundation.org
About the Foundation:

• Dedicated to Accelerating Biotechnology Innovation for Rare Disease Treatments
• Advocating practical and scientifically sound change in policy and law to increase the predictability of the regulatory process through scientific analysis and dialogue, grassroots support & expert-led workshops.
• Foundation Mission:
  – No disease is too rare to deserve treatment
  – All treatments should be safe & effective
  – We could be doing more with the science we already have
Dean Suhr

- **EveryLife Foundation** – Newborn Screening Advocate
  - dsuhr@EveryLifeFoundation.org

- **MLD Foundation** – President & Co-Founder
  - RUSP Roundtable – August 2015
NBS Overview

• **1st NBS was in 1963 ... 52 years ago**
  – Robert Guthrie was NBS pioneer with PKU ... Guthrie card
  – Today NBS includes Guthrie card, hearing test and pulse Ox.

• **4 million US babies are screened every year**

• **6,000 detected**
  – “Out of range” reading leads to a diagnostic test

• **Progress**
  – In 2003, **46 states** screened for **only 6 disorders**
  – As of 2015 **all states** were testing for **at least 26 disorders**
NBS ... more than a test

• **NBS is a public health program, not just a test**
  – Awareness, education, screening, credibility, trust, & access
  – Connect infants with treatments

• **Many stakeholders**
  – Medical, ethical, public health, science, advocacy, financial, pharma/biotech, research, academia, payers
  
  ... and most importantly the infants & families

• **Complex pre-analytic, analytical, and post-analytical processes**

• **Financial and ethical concerns**
Pre-analytic NBS

Birth
- Consent
- Storage
- Timing

DBS Collection
- DBS shipment

Shipping/Couriers
- Operating hours
- Staff

Arrival at Lab
- LIMS systems
- Required Data

Data Entry/Confirmation

Analytic -> Post-analytic NBS

Lab Processing/Testing
- QA/QC
- Algorithms
- Assays
- Confirmation

Critical Results
- Communicate results

Non-Critical Results
- Communicate results

All Results
- Communicate results

One or two specimens
- Disorders Screened
- Rules/Regulations

Intervention Initiated
- Evaluate newborn
- Diagnosis Confirmed

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Federal Recommends – States Implement

• **States make the final choice to implement**
  – Can implement more or less than recommended

• **Federal – ACHDNC (originally SACHDNC)**
  – HHS Secretary’s Advisory Committee on Heritable Disease in Newborns & Children
  – Established 2003
    • 10 voting members
    • 16 agency and liaison representatives
  – **ACMG** tasked to develop a process for evaluating and prioritizing NBS ... the RUSP
    • completed in 2006
Recommended Uniform Screening Panel (RUSP) Criteria

Using a structured evidence-based review process ...

- Condition can be identified at 24 to 48 hours, and is not otherwise detected by a doctor's clinical exam.
- Screen must be specific, sensitive, cost-effective, efficient, implementable, and reliable.
- Early detection leads to timely intervention and a viable effective treatment.

See ACHDNC site for full details of the evidence based review http://bit.ly/SACHDNCnominate
HHS Secretary Makes Final Recommendation

- **ACHDNC**
  - Accepts nominations & applications
  - Decides if application will be sent to Evidence Review committee
  - Evaluates Evidence Review report
  - Decides if they want to refer to HHS Secretary

- **HHS Secretary**
  - May ask for additional information, often from outside the ACHDNC
  - Has, so far, put all ACHDNC referred conditions on the RUSP
  - But it takes time ... months to years
RUSP - Recommended Uniform Screening Panel

- **29 of 81 conditions on the initial 2006 RUSP**
  - **25** on a secondary panel
    - “Disorders that can be detected in the differential diagnosis of a core disorder”
    - Not a guarantee to catch all cases
  - **27** were excluded due lack of test or viable therapy
  - **3** have been added to the RUSP since 2006
  - **2** more have been referred to the HHS Secretary
  - **0** conditions are currently in evidence review
Screening of the 32 Core Disorders

*Screening is on the state panel and fully implemented in the state*

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Federal Roles

• **HRSA (HHS)**
  – Guide development of screening standards & infrastructure
  – Fund development of education/training materials

• **FDA**
  – Guidance on pulse oximeters

• **NICHD (NIH)**
  – Research, screening technology, diagnostic processes
  – Clinical care provided and health outcomes

• **CDC**
  – Surveillance & outcomes
State Role

• States implement their own NBS panels – not required to follow RUSP
• Various ways to add a new screen
  • Legislation or executive order
  • Advisory committee
  • State health department recommendation
• State Public Health role in NBS
  – Public awareness, education, trust, access
  – Standards, process, quality assurance
  – Follow-up and evaluation
NBS & Research

• Primary purpose of NBS is identifying newborns
• Important but secondary benefit is research
  – Quality control & improvement
  – Blood spot retention & research access
  – Analysis of screening results – health trends
  – Development of new screens
  – Development of new therapies
  – Consent issues
  – Ethical concerns ... “blood is DNA”
NBS Consent

- **Consent for screening**
  - NBS is a **mandatory** public health program with opt-out provisions

- **Consent for research**
  - Deidentified spots have not historically required consent
  - Pilot programs need “live” spots
  - Newborn Screening Saves Lives Reauthorization Act of 2014
    - Section 12 requires informed consent for federally funded research using blood spots captured after March 2015
Which States Use Dried Blood Spots for Research?

Residual Dried Blood Spot Used for Research?
- Yes
- No
- Not Used for Research
- Not Provided

*The state labels on the map indicate whether or not residual dried blood spot specimens are consented for research.

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Dried Blood Spot Retention Time

Summary Count

- 1-6 Months
- 7-12 Months
- 2-5 Years
- 10-20 Years
- 21-30 Years
- Indefinitely

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Data Storage Periods

- Normal Specimen Data Storage Period
  - 2 years or less
  - 3-5 years
  - 6-10 years
  - 20 years or more
  - No data retention policy
  - Not Provided

- Abnormal Specimen Data Storage Policy
  - 2 years or less
  - 3-5 years
  - 6-10 years
  - 20 years or more
  - No data retention policy
  - Not Provided

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How States Differ in NBS Implementation

Every state is unique ...

- 1 screen vs. 2 screens
- State advisory committees
- Timeliness of screening & diagnostics
- How long it takes to “go live”
Number of screens (1 vs. 2 Screen States)
Advisory committees across the U.S.

State Newborn Screening Advisory Committee
- Mandated by Statute or Law
- Voluntary
- No Advisory Committee
- Data Not Provided to NewSTEPs
Timeliness outcomes in infants diagnosed with disorders

Birth to Receipt by lab

Birth to Report of Results

Birth to Intervention

Birth to Diagnosis

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Timeline of adding to state panel

General Process for Adding Conditions

State(s) consider condition(s), design and execute studies, provide study data

- Condition is added to the RUSP
- State decides to add or not to add condition
- State changes rules/statutes
- State obtains funding
- State conducts implementation or pilot

6-12 mo
6-12 mo
1-3 yrs
1-3 yrs
What’s Been Added to the RUSP?

• Initial RUSP ... 2006 (29 conditions)
• SCID ... Feb. 2010
  – The first condition added to the initial RUSP
• CCHD ... Sep. 2011
• Pompe ... Mar. 2015
• Recommended to HHS Secretary
  – MPS-I ... Feb. 2015
  – ALD ... Aug. 2015
SCID Screening Status

SCID Screening Status
- Universally screening
- Required but not yet fully implemented
- Offered to select populations, or by request
- Being considered but not yet approved
- Not Screened

State Screening Status Count

- Universally screening: 33
- Required but not yet fully implemented
- Offered to select populations, or by request
- Being considered but not yet approved
- Not Screened

Added to RUSP – Feb 2010

Slide courtesy of APHL
2009

SCID Screening Status
- Not Screened
- Universally Screened

State Screening Status Count
- Not Screened
- Universally Screened

2

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Added to RUSP – Feb 2010

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2011

SCID Screening Status
- Not Screened
- Universally Screened

State Screening Status Count
Not Screened
Universally Screened 5

Added to RUSP – Feb 2010

Slide courtesy of APHL
2012

SCID Screening Status
- Not Screened
- Universally Screened

Added to RUSP – Feb 2010

Slide courtesy of APHL
2013

SCID Screening Status
- Not Screened
- Universally Screened

State Screening Status Count
- Not Screened
- Universally Screened

15

Added to RUSP – Feb 2010

Slide courtesy of APHL
2016

SCID Screening Status
- Not Screened
- Universally Screened

State Screening Status Count

- Not Screened

- Universally Screened

45

Added to RUSP – Feb 2010

Slide courtesy of APHL
SCID Summary

• Added to RUSP in 2010
• 66% of states and 72% of newborns are screened for SCID
  – Measure by states implemented or by newborns tested?
• By end of 2016, 86% will be screened
CCHD Screening Status

Recommended by ACHDNC – Oct 2010
Added to RUSP – Sep 2011

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Pompe Screening Status

Recommended by ACHDNC – Jun 2013
Added to RUSP – Mar 2015
Pompe Implementation Status

• Required but not fully implemented
  – New Jersey
  – Kentucky
  – Texas
  – Michigan

• Being considered, not yet approved
  – Colorado
  – Ohio
MPS-I Screening Status

Recommended to RUSP – Feb 2015

Slide courtesy of APHL
Lysosomal Disease (LSD) Status

• Missouri
  – Pompe + 3 LSDs by digital microfluidics
  – Krabbe, Niemann Pick A/B by stand-alone fluorometry (in validation)

• Wisconsin
  – NIH funded Pompe NBS pilot study
  – Bill introduced for 6 LSDs: Krabbe, Fabry, Pompe, Niemann–Pick, Gaucher, MPS-1
Lysosomal Disease (LSD) Status

• New York
  – NIH funded Pompe NBS pilot study
  – Pilot testing (four NY City hospitals: Fabry, Gaucher, Niemann-Pick A/B, MPS-I)
  – Live screening: Krabbe, Pompe

• Washington
  – De-identified samples: Pompe, Fabry and Gaucher, FIA-MS/MS + molecular
  – Recently expanded to include 3 more LSDs
Reviewed but Not Recommended

• Evidence reviewed but not referred to the RUSP
  – Krabbe Disease
  – Hemoglobin H
  – Neonatal Hyperbilirubinemia

• Applied to ACHDNC but not submitted to evidence review
  – 22q11.2 Deletion Syndrome
  – Fabry Disease
  – Niemann-Pick Disease
  – Spinal Muscle Atrophy

• HHS Secretary has, so far, put all referred conditions on the RUSP ... but it takes time, months to years
NBS Working Group – Potential Focus

- Implementing the RUSP at the state level
- State toolkits
- State appropriations
- NBS for research
  - Pilot Studies
  - Disease/condition research
- Consent
  - NSSL’14 Section 12

- Timeliness of process
- Blood spot retention & access
- Screening results capture
- RUSP criteria
  - Viable therapy(?)
- Scope of the ACHDNC

Your suggestions, experiences and priorities
Community Congress

• Max Bronstein, Senior Director, Advocacy & Science Policy
  – Mbronstein@EveryLifeFoundation.org
• Create a formal group and process to receive input from Industry, patient organizations and other stakeholders to ensure the Foundation advocacy efforts are addressing the most pressing needs of the rare disease community
• Help prioritize the Foundation’s plans for the coming year
• Create working groups to address urgent policy issues
• Set tangible and achievable policy goals, devise strategies to have policy impact
RareCongress.org

- The **Community Congress** is a membership-based program of the EveryLife Foundation dedicated to bringing patient organizations, industry leaders, and other rare disease stakeholders together.

**Who can be a member of the Community Congress?**

- Pharmaceutical companies, patient organizations, and other stakeholder organizations are welcome to become members of the Community Congress.

*No charge for patient organization membership.*
No Disease Is Too Rare to Deserve Treatment
What’s Next?

• NBS Community Congress Working Group
  – Expand 2015 membership

• Next Webinar, October 20th 2pm Eastern
  – Determine 2015 project goal

• Community Congress in Person Meeting
  – Wednesday, Nov. 4th, Washington DC
  – Determine Strategies for achieving goal