LABORATORY STANDARDS AND PROCEDURES WORKGROUP

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WORKGROUP ROSTER

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Agenda

1. Welcome & roll call (10 min)
2. Review priority projects for Lab Workgroup (5 min)
3. Lab Procedures: role of next generation sequencing (NGS) in newborn screening (30 min)
   a) Newborn Gene Sequencing Meeting – Overview & Outcomes
   b) Discussion/Next steps
4. Infrastructure and services to meet timeliness goals (30 min)
   a) NewSTEPs/360: Timeliness Updates.
   b) Discussion/Next steps
5. New topics (20 min)
6. Wrap-up and adjourn (10 min)

Workgroup Charge

Define and implement a mechanism for the periodic review and assessment of

1. The conditions included in the uniform panel
2. Laboratory procedures utilized for effective and efficient testing of the conditions included in the uniform panel.
3. Infrastructure and services needed for effective and efficient screening of the conditions included in the uniform panel

Project 1

- 1. Laboratory procedures: Explore the role of next generation sequencing in newborn screening
  - Screening is currently based on phenotypic data. How do we accumulate the data to identify correlation between phenotypic & genotypic data?
  - Are there conditions for which sequencing is the only screening method?
  - What do you gain/lose from NGS?
  - Which data do you report?
    - What do you do with variants of unknown significance?
    - When do you report carrier status? Are there particular conditions where reporting carrier status is important?
  - What new infrastructure needs to be built for NGS?

Project 2

2. Infrastructure and services: A portion of the timeliness initiatives fits here:

- Review data related to testing (Timeliness 1.0)
- What are the implications of earlier specimen collection (<24 hrs)?
- What are the unforeseen consequences and costs of timeliness?

The purpose of this meeting is to convene pertinent stakeholders to discuss the current status of gene sequencing in newborn screening, and identify barriers and solutions for the successful incorporation of gene sequencing into newborn screening.

Basic Facts

- February 16-17, 2017 in Atlanta, GA
- Sponsored by APHL, in collaboration with CDC and HRSA
- Primary invitees were NBS Laboratory Directors, Managers and Follow Up Coordinators from states and territories across the U.S.
- >40 States and >120 participants
- 13 presentations and 4 breakout sessions

Meeting Objectives

- Discuss the current status of gene sequencing in newborn screening and identify second tier and future applications.

- Outline the differences between mutation panel and sequencing data.

- Outline implementation considerations and instrument and informatics requirements for new gene sequencing technologies and newborn screening disorders.

- Explain how gene sequencing information is used in newborn screening reporting, education, follow up and patient care.

- Provide state experiences in implementing gene sequencing.

- Discuss laboratory and follow up needs, barriers and solutions for the incorporation of gene sequencing into newborn screening

- Apply quality improvement initiatives in developing plans of action for the incorporation of gene sequencing into newborn screening.

Common Barriers Identified

- Decision making
- Knowledge barriers / gap / personnel skillsets
- Cost / funding / resources
- Reporting – VOUS, consistency, change of urgency
- Information technology and bioinformatics
- Laboratory specific – instruments, space, workflow, timeliness
- Follow-up specific – education, LTFU

Analysis. Answers. Action.

Potential Solutions

- Creating regional sequencing laboratories
- Peer-to-peer training
- Training videos
- Resource call site
- Clinical variant database with information relevant for newborn screening (ClinGen)

Next Steps

- Action Plans for individual states
- An evening follow-up session at the APHL Newborn Screening and Genetic Testing Symposium in September
- Decision making matrix
- Training opportunities
  - Peer network resource centers, online education modules, APHL web site
- Mutation database

TIMELINESS GOALS

- To achieve the goals of timely diagnosis and treatment of screened conditions and to avoid associated disability, morbidity and mortality, the following time frames should be achieved by NBS programs for the initial newborn screening specimen:
  - Presumptive positive results for time-critical conditions should be communicated immediately to the newborn's healthcare provider but no later than five days of life.
  - Presumptive positive results for all other conditions should be communicated to the newborn's healthcare provider as soon as possible but no later than seven days of life.
  - All NBS tests should be completed within seven days of life.
- In order to achieve the above goals:
  - Initial NBS specimens should be collected in the appropriate time frame for the newborn's condition but no later than 48 hours after birth, and
  - NBS specimens should be received at the laboratory as soon as possible; ideally within 24 hours of collection.

Timeliness Discussion

- APHL will present the timeliness data in August - data collected 2012 - 2015 from 39 states (also used in GAO report)
- May be able to show more recent data (2016) in August
- States are improving but not meeting the recommendations 95% of the time
- Committee recommended that states meet the goals 95% of the time by 2017

- NewSTEPs 360 – funded improvements in 28 state programs
- Working with other national organizations (MoD, ASTHO, AMCHP) to develop a tool kit to help programs that want to increase program hours/courier.
- Share success stories publicly and with staff in the state programs
- APHL policy statement on timeliness goals; they hope to publish in 2017

Cut-offs Discussion

- What's the ultimate goal? How can we help state programs?
- APHL survey of state practices
- Data comparing cut-off alone vs. cut-offs with other co-variates
- Figure out how to normalize data between labs and develop a risk assessment algorithm using analytes and other variables (similar to maternal health screening)
- Share resources/strategies that are already available now to improve screening algorithms