Newborn Screening Translational Research Network (NBSTRN) and LSD Pilot Studies

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Supporting pilot studies of new conditions in newborn screening including diagnostic, management and follow-up protocols and associated IT, informatics and databases

- SCID
- LSDs

Supporting the development of new technologies for use in newborn screening
ACHDNC Activity in LSD Newborn Screening

- **Pompe needs**
  - Pilot studies in diverse US population
  - Pilot testing using technologies likely to be used in US (e.g., MS/MS, bead-array technologies, microfluidics)

- **Krabbe**
  - Not recommended for addition to NBS at this time

- **Niemann Pick**
  - Not sent for evidence review due to incompletion of treatment clinical trials

- **Gaucher and Fabry**
  - Hang on to your hats
Current State-based and Private Sector Activities for LSD NBS

- **New York**
  - Screening for Krabbe for two years
  - Legislation proposed to expand to 4 additional LSDs

- **Illinois**
  - Mandates addition of 5 LSDs (Krabbe, Pompe, Niemann Pick, Gaucher, Fabry)
    - To be initiated in October, 2010

- **Missouri**
  - Mandates addition of 5 LSDs above plus any others that become amenable to NBS

- **Washington**
  - Limited NICHD pilot study testing new MS/MS technologies

- **Perkin Elmer supplemental screening**
Additional NBS System Needs

- **Primary care provider guidance**
  - Provider networks
  - ACT Sheets
  - Guideline on Diagnosis and Management of the Asymptomatic LSD Patient
  - Diagnostic algorithms

- **Specialist and sub-specialist guidance**
  - Establishing preferred technologies for NBS
  - Developing diagnosis and management protocols
Comparative Assessments of LSD NBS Technologies

- Mayo studies organized by Dieter Matern
  - MS/MS
  - Bead-based immunoassays
- Adding microfluidics (Advanced Liquid Logic) to comparison
- Normalizing to enzyme activity
Organizing LSD experts for protocol development and associated language standardization

- First substantive meeting in June 2010
- Building off of LTFU data sets already developed to include LSD disease specificity
- Developing databases to support collaborative pilot testing
Screening Strategy
Example: Pompe Disease

**MS/MS-based multi-enzyme assay**
- GAA >1.19 µmol/l/h blood
- GAA 0.9-1.2 µmol/l/h blood (possible carrier)
- GAA <0.33 µmol/l/h blood (patient range, n=5)

**multi-protein immunocapture assay**
- GAA <2.6 µg/l
- GAA >2.6 µg/l

**FIRST TIER ASSAYS (run in parallel)**

**SECOND TIER ASSAY**
- specific GAA assay
  - Below Detection Limit
  - 2.5-7.0 pmol/punch/h
  - >7.0 pmol/punch/h

**Presumptive Positive**

**NORMAL**

**NORMAL**

**CARRIER**

**Confirmatory testing by molecular genetic analysis**

4. Median for DBS of neonatal onset Pompe patients: 0.2 µg/L (n=3)
THANK YOU!

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