Regional Genetics and Newborn Screening Collaboratives Coordinating Center

• HRSA funded program to:
  – Bridge between public health, primary care and specialists
  – Improve access to genetic services in local communities
Goals of the NCC (1)

• Facilitates communication and collaborations between RCs and nationally
• Responds to issues best addressed nationally
  – Minimize duplication of efforts
  – Take advantage of shared resources
• Organizes trans-RC workgroups
• Provides guidance and technical resources
• Translates best practices and RC activities into national initiatives
• Focus on non-genetics providers
Goals of the NCC (2)

• Develops management guidelines and tools for RCs, providers, policymakers and other stakeholders

• NCC interfaces with ACMG
  – When endorsement needed for NCC/RC work products (e.g., practice guidelines, ACT sheets)
  – When collaboration can leverage impact of activities in either direction
  – When RCs can benefit from existing ACMG relationships and convening power
American College of Medical Genetics

Professional home to ~1500 biochemical, clinical, cytogenetic, medical and molecular geneticists, genetic counselors and other health care providers committed to the practice of medical genetics.

• ACMG initiatives include activities to:
  – Advance the practice of medical genetics
    • From promulgating laboratory and practice guidelines to advocating for fair health policies;
  – Increase access to genetic services and improve the public’s health;
  – Promote development and implementation of methods to diagnose, treat and prevent genetic disease.
ACMG Mission

Define and promote excellence in medical genetics practice and the integration of translational research into practice

Promote and provide medical genetics education

Increase access to medical genetics services and integrate genetics into patient care

Advocate for and represent providers of medical genetics services and their patients

Improve health through the practice of medical genetics
Define and promote excellence in medical genetics practice and the integration of translational research into practice.
Validated Heritable Disease
Genetic Testing in Health Care

• Currently testing in over 1,500 genes
  – Delivering over 5000 genetic tests

• Includes:
  – Rare diseases
    • Diagnostic (prenatal, reproductive loss and live born) and family-based
    • Presymptomatic
  – Susceptibility to diseases
  – Reproductive risk testing
  – Public health
    • Screening (prenatal, newborn, carrier, disease-based)
U.S. Newborn Screening – 2009

No. of mandatory disorders screened for in the United States
Building Systems to Improve our Understanding of MR/DD and Autism
Clinical genetics evaluation in identifying the etiology of autism spectrum disorders

G. Bradley Schaefer, MD¹, Nancy J. Mendelsohn, MD², and the Professional Practice and Guidelines Committee

Key Words: pervasive developmental disorders, tiered evaluations, diagnostic yield, Asperger syndrome
A synthesis of the published literature suggests that the following diagnostic yields would be projected in the genetic evaluation of ASDs:

- High-resolution chromosome studies (5%)
- aCGH—beyond what would be detected by chromosomal analysis (10%)
- Fragile X (5%)
- MECP2 (5%—women only)
- PTEN (3%—if head circumference >2.5 SDs)
- Other (10%)

Thus, using current knowledge and technology, a thorough clinical genetics evaluation of persons with ASDs will result in a positive answer in up to 40% of individuals.
<table>
<thead>
<tr>
<th>No work-up indicated</th>
<th>Autism evaluation indicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fragile X syndrome</td>
<td>Apert syndrome</td>
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<tr>
<td>Rett syndrome</td>
<td>Williams syndrome</td>
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<tr>
<td>Angelman syndrome</td>
<td>Joubert syndrome</td>
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<tr>
<td>Prader-Willi syndrome</td>
<td>Noonan syndrome</td>
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<tr>
<td>Smith-Lemli-Opitz syndrome</td>
<td>Down syndrome</td>
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<tr>
<td>Smith-Magenis syndrome</td>
<td>Turner syndrome</td>
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<tr>
<td>Tuberous sclerosis</td>
<td>Neurofibromatosis</td>
</tr>
<tr>
<td>PTEN associated disorders</td>
<td>Myotonic dystrophy, Duchenne dystrophy</td>
</tr>
<tr>
<td>(Cowden syndrome, Bannayan-Riley-Ruvalcaba syndrome)</td>
<td></td>
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<tr>
<td>Shprintzen syndrome (22q11 deletions)</td>
<td>Moebius anomaly</td>
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<tr>
<td>Sotos syndrome</td>
<td>Cohen syndrome</td>
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<tr>
<td>CHARGE syndrome</td>
<td>Oculo-auriculo-vertebral spectrum</td>
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<td>Hypomelanosis of Ito</td>
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<tr>
<td>Lujan-Fryns syndrome</td>
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<tr>
<td>De Lange syndrome</td>
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</tr>
</tbody>
</table>

Opportunities in Grants, Cooperative Agreements, and Contracts

• National Coordinating Center for Regional Genetics and Newborn Screening Collaboratives
  – Long-term follow-up of newborn screening patients as a public health evaluation component

• Newborn Screening Translational Research Network Coordinating Center
  – Evidence bases to inform care and clinical investigation
Two Convergent Forces

Information Technology  Genetics

"Individualized Medicine"

- Vast amounts of information to integrate
- Clinical decision support tools replace practice guidelines

Medicine in Transformation
Newborn Screening Translational Research Network (NBSTRN)

- NICHD initiative
- Development of national resources to support research and development related to newborn screening
- Long-term follow-up of NBS
- Developing evidence base for NBS candidate condition
- Newborn screening laboratory network
- Clinical centers network
- Infrastructure development (informatics based)
Providers and Patients
• Clinical provider networks
  – Patient demographics
  – Consent
  – Patient diagnosis and management
    • Documentation in medical record
NBSTRN
Public Health Domain

- Needs provider data for:
  - long term follow-up for program evaluation
  - clinical history of candidate diseases to improve public health decision-making
  - Epidemiology
  - Surveillance
  - Health services research
  - Population-based biospecimen repositories
NBSTRN
Research and Clinical Investigation Domain

- Clinical provider networks
  - Developing clinical histories of NBS conditions and candidate conditions including lab and clinical
  - Patient registries
  - Patient biospecimen repositories
- Clinical trials
- Clinical investigation
  - New treatments
  - New technologies
Knowledge and Improvement Domain

- caBIG (NBSTRN) Portal
- Specific Projects
- Protocol/Care Plan Development
- Disease-Specific Clinical and Laboratory Language Standardization
- Long-term Follow-up Data

Patient Care Domain

- Institutional Medical Record
- Physician Chart
- Single Patient Database

Public Health Domain

- Data Warehouse

Outside Investigators

Health Services Research

Public Health Domain

Biospecimen Repositories

Patient Registries

NBSTRN Policies
Issues to Address to Realize Goals

• State sovereignty vs. realistic scientific needs for as many cases as possible to be gathered

• Databases
  – Standardizing laboratory and clinical languages for EMR compatibility
    • HHS to use NBS as a model
  – EHRs to support patient needs

• Role of NCC/RC system will be critical
  – Development of system (s)
  – Data collection

• International integration
  – Other countries
  – International Human Variome Project
The Future

Will involve:

– Multifaceted collaborations
– Advanced communication technologies
– Interconnected efforts
  • Long-term follow-up
  • Data collection
  • EMR
  • ACT Sheets
Structure of NCC

• Cooperative agreement between GSB/MCHB/HRSA and American College of Medical Genetics (ACMG)

• Staff:
  – Michael Watson, PhD - Project Director
  – Judith Benkendorf, MS, CGC - Project Manager
  – Lori Oxendine, BFA, AIGA - Meetings/Publications
  – Gloria Weissman, PhD - MCH Consultant

  – www.NCCRCG.org
Thank you