Molecular Assessment Program: MAP

Christopher N. Greene, PhD

Newborn Screening and Molecular Biology Branch,

Division of Laboratory Sciences

NCEH, CDC

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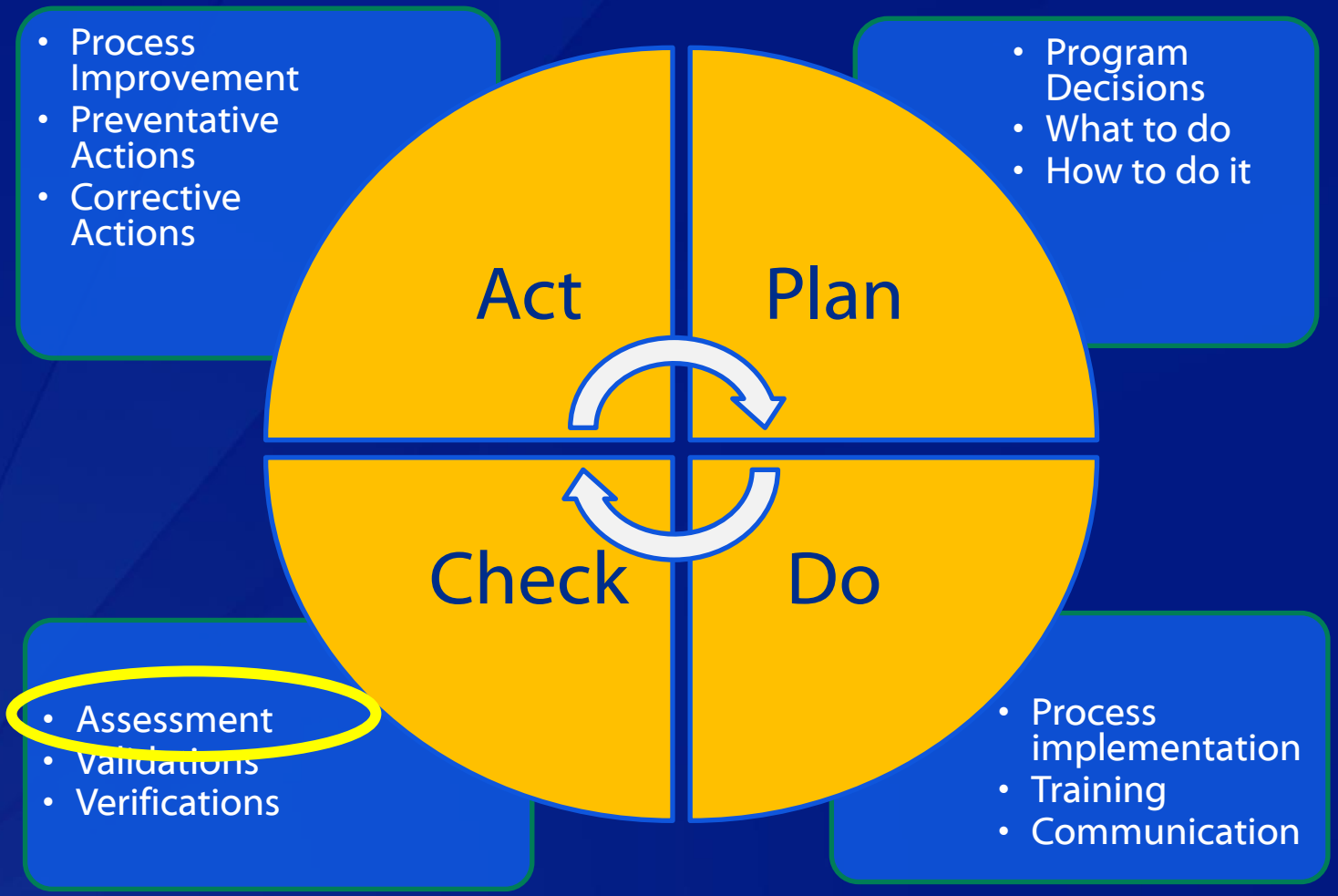
Quality Improvement Cycle



NBS Molecular Assessment Program (MAP)

- **Evaluation of molecular newborn screening programs**
  - **Invited site visit of molecular biologists from:**
    - **CDC's Newborn Screening and Molecular Biology Branch**
    - **State Public Health Newborn Screening Programs**
    - **Representatives from Association of Public Health Laboratories**
- **Support for newborn screening laboratories**
  - **Non-regulatory review of molecular testing activities**
  - **Guidance for expansion of NBS molecular testing**
  - **Provided at no cost to participating programs**

Why MAP was Developed

- Gaps in current regulatory guidelines
  - No CLIA genetic testing specialty – CMS recommends use of general guidelines for high-complexity tests
  - Standard regulatory framework does not allow for complexity involved in molecular testing
  - Inflexible regulations may prevent use of new technologies

What Constitutes a High Complexity Test

- Specialized Knowledge
- Training and Experience
- Reagents and Materials Preparation
- Characteristics of Operational Steps
- Calibration, Quality Control, and PT Materials
- Test System Troubleshooting
- Interpretation and Judgment

Three point scale for each criteria – most molecular 18-21 points

CLIA FR 493.17

Why MAP was Developed

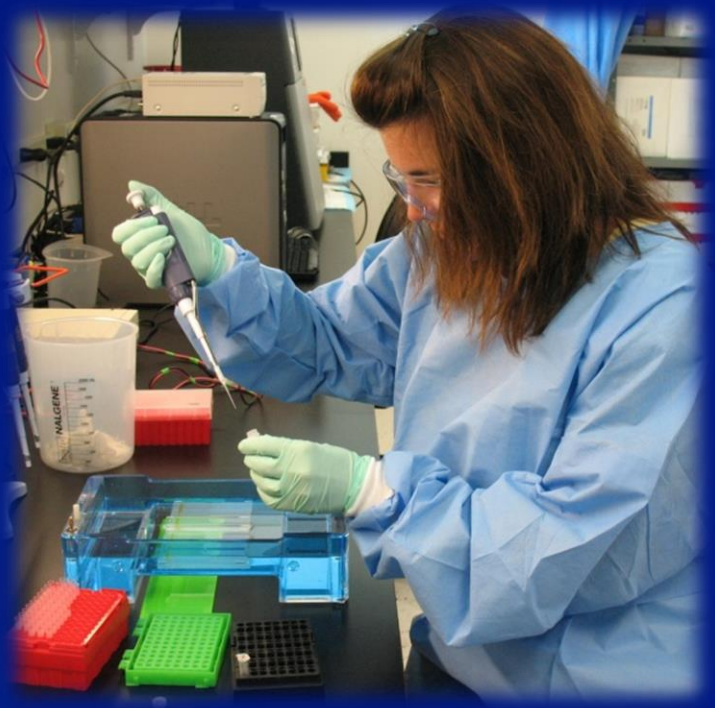
- Molecular tests have different quality management requirements
  - DNA extraction
  - PCR amplification common step
  - Cross contamination risks
  - Types of positive and negative controls

Goals of MAP

- **NBS Laboratory Support**
  - **Provide molecular testing-specific assistance for NBS laboratories implementing molecular testing**
  - **Guidance for laboratories that are expanding NBS molecular testing**
  - **Mechanism to communicate best practices and strategies for continual laboratory assay quality improvement**

What is the Benefit for NBS Programs?

- Consider how to fit molecular testing into a screening program
- Balanced approach:
  - Application needs
  - Available resources



What is the Benefit for NBS Programs?

- MAP teams represent a range of molecular NBS experts
  - Provide alternate approaches for molecular screening
  - Best-practices and ideas for what has worked for other programs
  - Help in planning for new molecular screening assays

MAP Activity

- **Program Site Visits**
  - 2011:
    Wisconsin, New York State,
    Washington State
  - 2012:
    Michigan, Texas
  - 2013:
    Florida, Minnesota, Virginia, Ohio
  - 2014:
    New Jersey, Georgia,
    Massachusetts, Connecticut
  - 2015 (planned):
    Kentucky, Maryland, Puerto Rico
- **Program Partners**
  - APHL
  - Wisconsin
  - New York State
  - Washington State
  - Michigan
  - Texas

Basis for Evaluations

- Assessment criteria modeled from multiple sources:
  - NNSGRC Performance Evaluation Assessment Scheme (PEAS)
  - CLIA regulations
  - Molecular Pathology Checklist (CAP)
  - Standards and Guidelines for Clinical Genetics Laboratories (ACMG)
  - Clinical Laboratory Standards of Practice (NYSDOH)
  - Good Laboratory Practices for Molecular Genetic Testing for Heritable Diseases and Conditions (MMWR)

Professional Guidelines

- **American College of Medical Genetics (ACMG)**
  - Standards and Guidelines for Clinical Genetics Laboratories
    - General Standards and Guidelines
    - Clinical Biochemical Genetics
    - Clinical Molecular Genetics
  - Disease/Phenotypic-Specific Standards and Guidelines

www.acmg.net – publications

Professional Guidelines

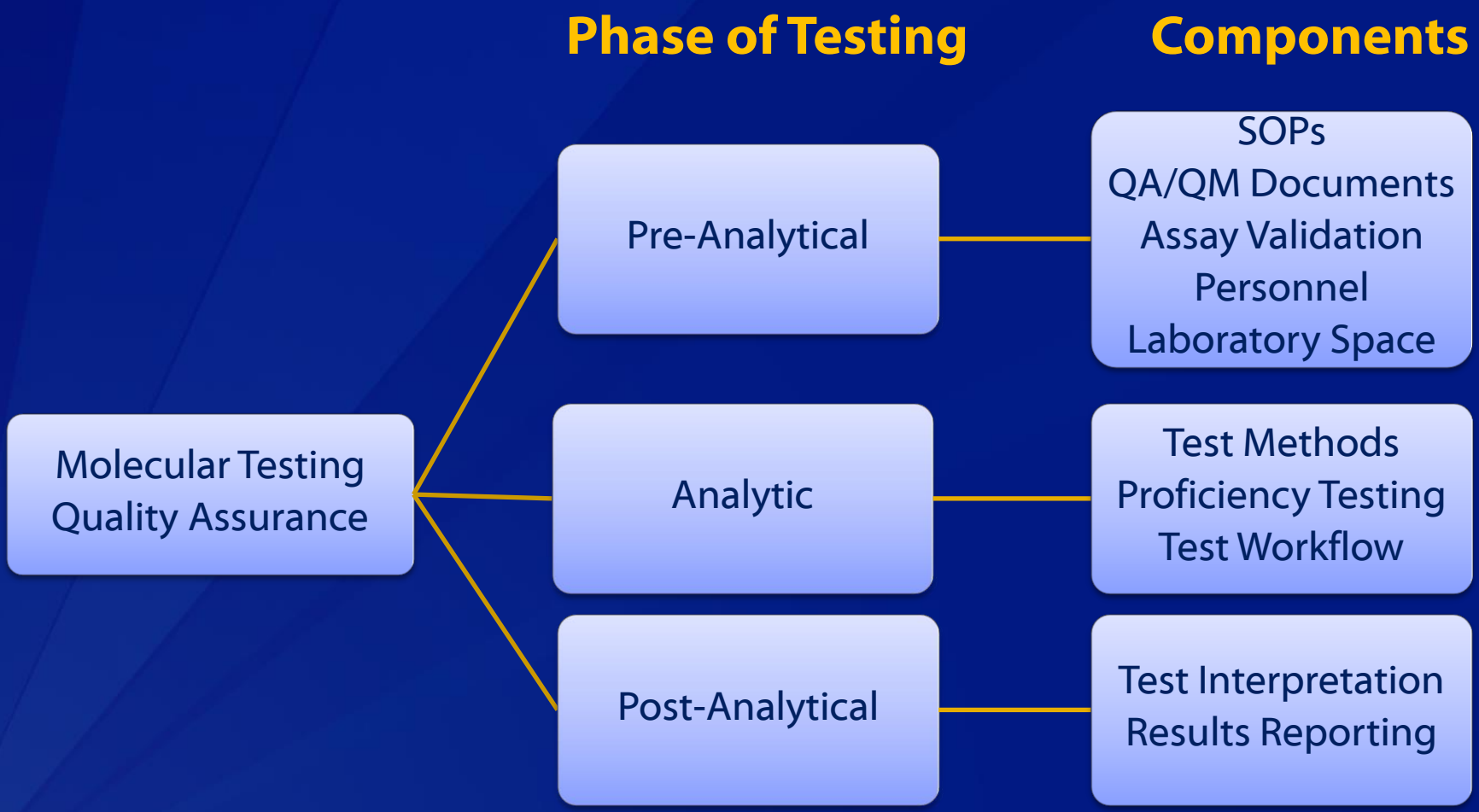
- **Clinical and Laboratory Standards Institute (CLSI)**
  - MM01-A2: Molecular Diagnostic Methods for Genetic Diseases
  - MM13-A: Collection, Transport, Preparation, and Storage of Specimens for Molecular Methods
  - MM14-A: Proficiency Testing (External Quality Assessment) for Molecular Methods
  - MM17-A: Verification and Validation of Multiplex Nucleic Acid Assays
  - MM19-P: Establishing Molecular Testing in Clinical Laboratory Environments

Professional Guidelines

- **College of American Pathologists**

  - Molecular Pathology Accreditation Checklist
  - CAP Learning Portal
  - Archived webinars and presentations

MAP: Molecular Assessment Program



Overview of MAP Site Visits

- **Pre-visit**
  - Review of written SOP and quality assurance manuals
- **Visit Day 1**
  - Overview of program and molecular activities
  - Assessment of molecular workspace and workflow
  - Review of quality assurance, validation documents and molecular reporting
- **Visit Day 2**
  - Exit discussion with program members
- **Post-visit**
  - Written report for program's use

MAP Site Visit Agenda

- **Two – Three Weeks Prior to Site Visit**
  - Discuss what is the goal for the site visit
  - Molecular assay SOPs for review
  - Quality Assurance/Management (QA/QM) documents for review
- **Day Prior to Site Visit**
  - Team discusses SOPs and documents to prepare for site visit
  - Dinner with hosting laboratory program

MAP Site Visit Agenda

- **Day 1: Morning**
  - Meet with laboratory members for review of NBS program and current molecular testing activities and future molecular plans
  - Program expectations for site visit
  - Laboratory observation of molecular procedures
- **Day 1: Afternoon**
  - SOPs
  - Laboratory and molecular-specific QA/QM plans
  - Assay validation
  - Molecular assay results reports

MAP Site Visit Agenda

- **Day 2: Morning**
  - Exit discussion with laboratory members
  - Observations and recommendations
  - Feedback to MAP team

Exit discussions usually finish before noon

Additional time can be allocated for specific topics

Program MAP Visit Requests

The NBS Molecular Assessment Program has conducted 10 site visits to state public health newborn screening laboratories. The purpose of NBS laboratory program requesting the site visits have included:

- An overall evaluation of molecular activities
- Suggestions for improving workflow efficiency
- Optimizing the utilization of workspace to reinforce unidirectional workflow
- Planning for implementing new assays
- Preparation for inspections

Results from Visits

- **Harmonization of SOPs**
- **Definition of molecular QA processes**
- **Modification to workflow**
  - Rearrangement of existing laboratory space
  - Acquisition of additional molecular-specific space
- **Opportunities for program collaborations**
- **Increased preparation for annual regulatory inspections**

Lessons Learned from MAP Visits

- Process must be flexible
  - Every program is unique
- Molecular-specific QA "Tips and Tricks"
  - Numerous valid molecular procedures for a given disorder
  - Readily accessible knowledge base for molecular screening is needed
- CDC and State Cooperation
  - Provides a "pulse-point" of molecular needs and challenges
  - Opportunities for State-State and Federal-State collaboration

Benefits of MAP

- Continual Quality Improvement process for molecular screening
- Address specific concerns of programs
- Recommendations for additional program support
- Provide opportunities for collaboration between public health NBS programs





MAP Site-Visit Teams

- Heather Wood (MI)
- Colleen Stevens (NY)
- Carlos Saavedra-Matiz (NY)
- Rachel Lee (TX)
- Tim Davis (WA)
- Mei Baker (WI)

APHL

- Elizabeth Jones
- Ruhiyyih Degeberg
- Jelili Ojodu
- Guisou Piñeryo

CDC

- Christopher Greene
- Suzanne Cordovado
- Stanimila Nikolova
- Francis Lee
- Jennifer Taylor
- Carla Cuthbert

APHL's NBS Molecular Subcommittee

For More Information on MAP

For questions about MAP:

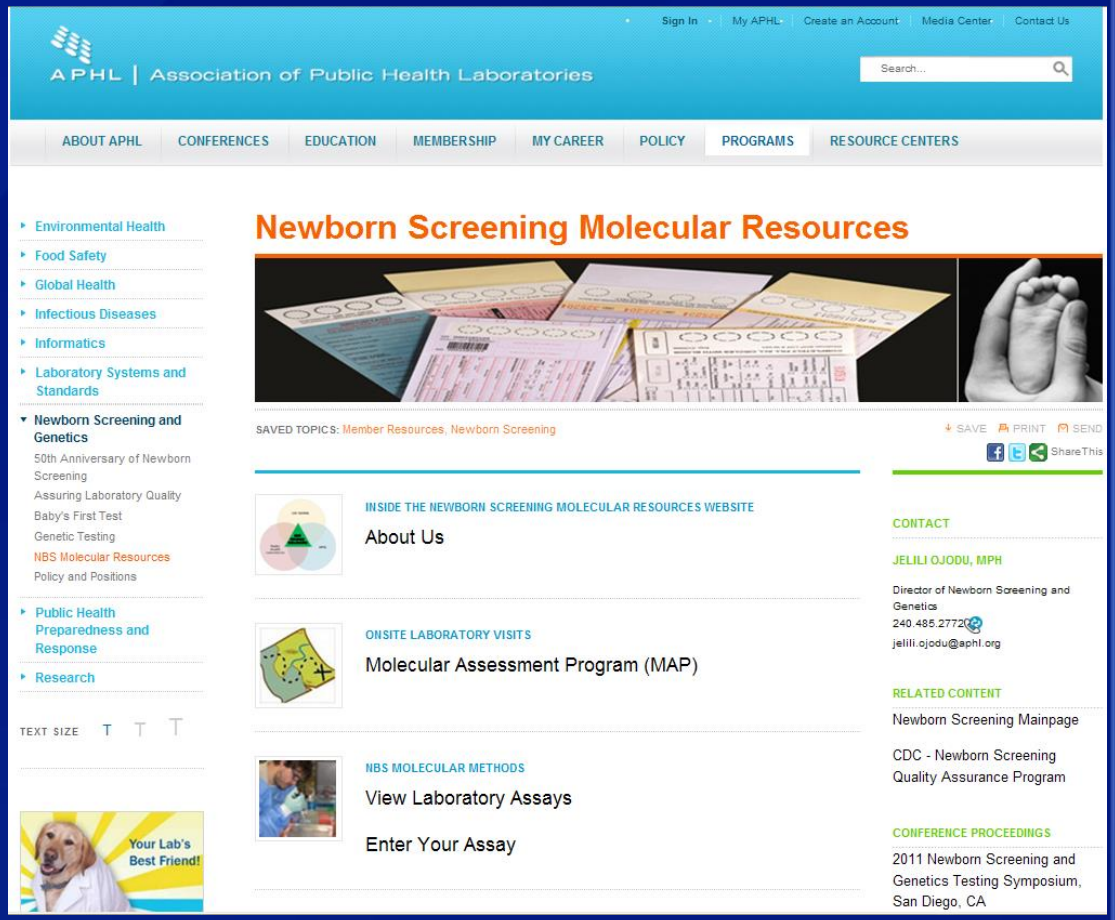
Christopher Greene

cgreene@cdc.gov

For access to the NBS Molecular Resources Website:

Guisou Piñeyro

guisou.pineyro@aphl.org



http://www.aphl.org/aphlprograms/newborn-screening-and-genetics/molecular/pages/default.aspx

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
Visit: www.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info