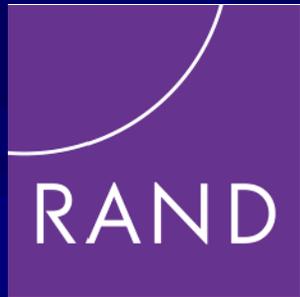


Clinical Decision Making: Promoting Appropriate Reporting and Understanding of Molecular Genetic Test Results



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Effective communication between laboratory and clinical professionals about the test and result can promote appropriate clinical decision making in support of achieving the health benefits sought and minimizing the potential for patient harm.

Example: Long QT Syndrome

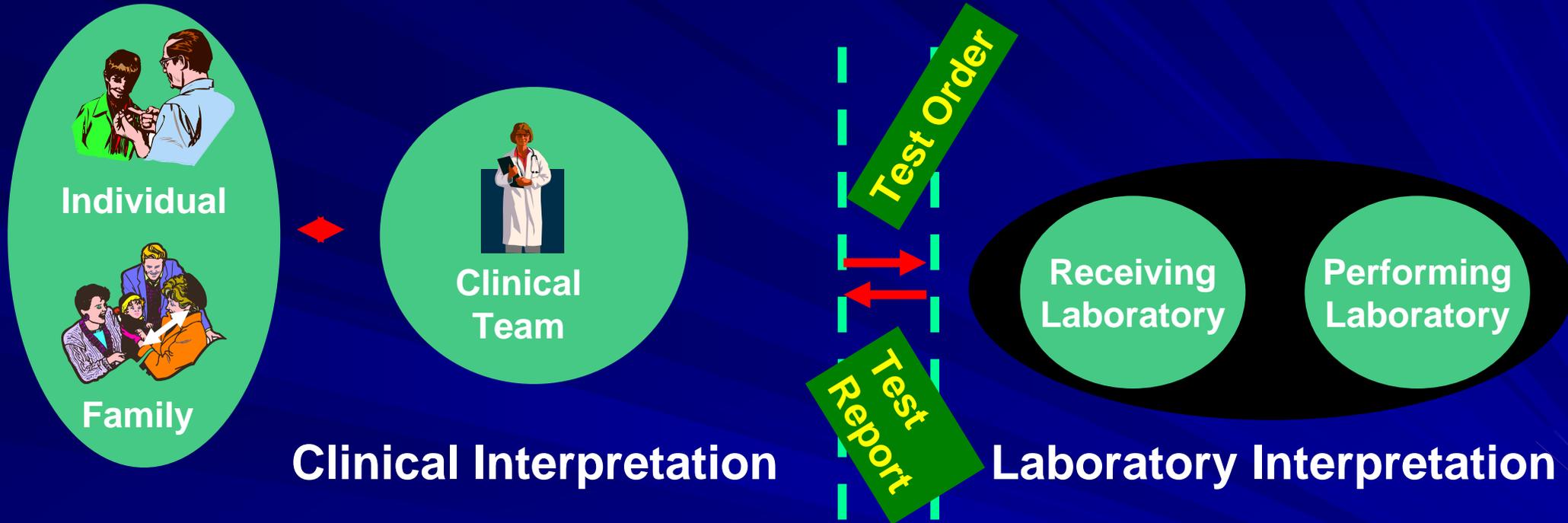
- Child born @ 32 weeks (38-42 weeks is average) / bradycardia / cyanosis / Placed in NICU
- Family history of heart disease
- Various tests suggest possible Long QT Syndrome (LQT)
- Mutation testing for LQTS NEGATIVE - LQT Syndrome RULED OUT **(WRONG!)**
- RE-EVALUATION by 2nd pediatrician - LQT SYNDROME DIAGNOSED,

**LQT diagnosed in patient and other family members
POTENTIALLY SAVED THREE LIVES!**

Genetic Test for Long QT Syndrome

- ✓ **Analytic Validity**
- ✓ **Clinical Validity**
- ✓ **Clinical Utility**
- ✓ **Guidance**
- X **As used in this clinical case
(implemented in practice)**

Genetic Testing: How Information Flows



Test requisition and result reporting provide venues for promoting appropriate use of the test and application of the results to clinical decision making and counseling

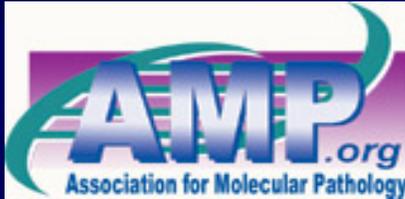
Background

- Molecular genetic testing is rapidly being integrated into medical practice
- Test results require integration with other data to be meaningful

Some studies that have raised concerns:

- 1997 - Giardiello (New Eng J Med 336:823) - FAP - Inadequate counseling due to misinterpretation of test reports
- 2001 - Sandhaus (Genet Med 3:327) - BRCA - Physicians not understanding genetic risk
- 2002 - Andersson et al (JMD 4:324) - Reporting of CF and fV Leiden results
- 2003 - McGovern (JAMA 281:835) - Genetic counselors needing clarification from laboratories
- 2004 / 2005 - Morgan (Genet Med 6:450 - Obst & Gyn 105:1355) - Practice patterns/use of CF screening guidelines
- 2007 - Lubin et. al. Ordering Molecular Genetic Tests and Reporting Results: Practices in Laboratory and Clinical Practice J Mol Diag

Partners



Wadsworth Center
New York State Department of Health

Integration with Broader Efforts

SACGHS

OECD

CLIAC

CETT

SACGHS. US System of Oversight of Genetic Testing, April 2008
(http://oba.od.nih.gov/sacghs/sacghs_documents.html)

Assessing Practices / Addressing Gaps

1. Look at test ordering (2003-2004)
2. Look at result reports (2003-2004)
3. Look at practices in laboratories and clinical settings (2004-2005)

Lubin et. al. Ordering Molecular Genetic Tests and Reporting Results: Practices in Laboratory and Clinical Practice J Mol Diag 2008;10;459-468.

4. Ask Clinicians - "What do you want?" (2006-2007)
5. Develop a framework that promotes effective reporting, understanding, and use of test results.

Lubin et al. Clinical Perspectives about Molecular Genetic Testing for Heritable Conditions and Developing a Clinician-Friendly Laboratory Report. J Mol Diag. In Press (to be published March, 2009).

General Principles:

- 1. Reports should be concise and informative**
 - Clinicians will typically not read/study a lengthy report**
- 2. Information should be presented in a logically tiered manner**
- 3. Missing information / key concepts should be tagged with additional explanation later in the report**
- 4. Report should be useful to others beyond the ordering clinician**
- 5. Guidance is desired**
- 6. People receiving report may not be clinicians (e.g., support staff, patients)**

Molecular Genetic Test Report Proposed Framework: A Starting Point

Framework: Format

Laboratory Contact Information

Patient information (incl. personal/family
health history)

Test performed / Indication for testing /
Specimen type

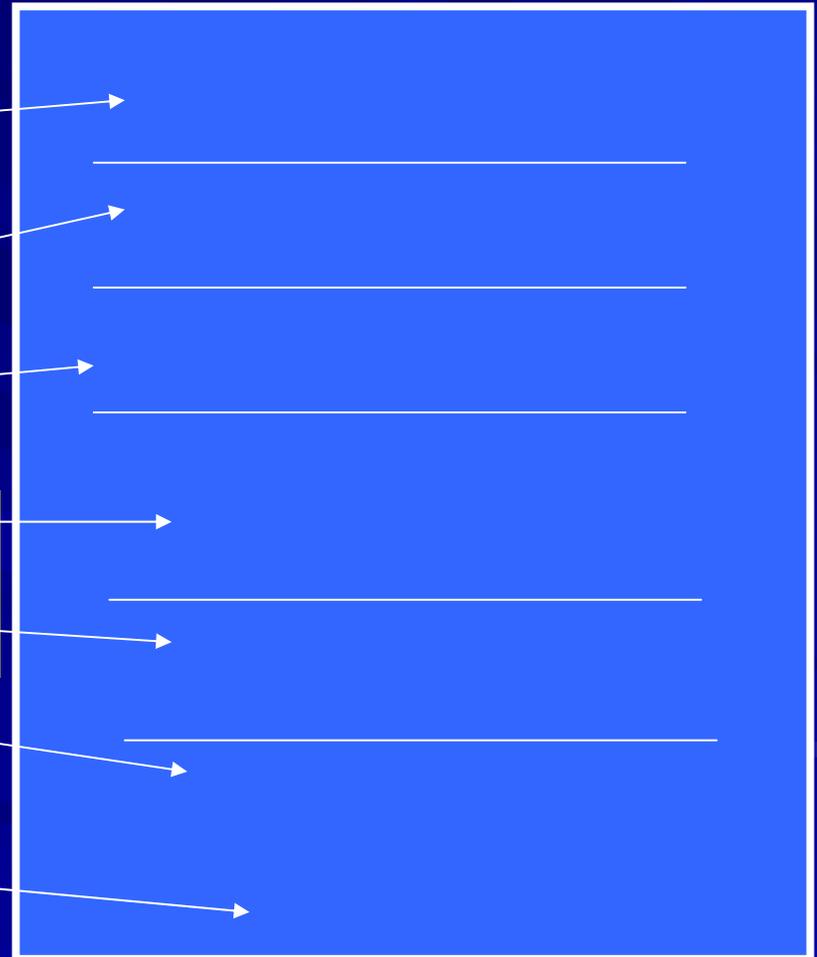
Result + brief interpretation

Guidance (including role for consultation)

Signature(s)

.....
Disclaimer

Supplementary information (page 2)



Improving the Reporting Process: Three Components

COMPONENTS

**Result Report
(and requisitions)**

**Information
Resources**

**Educational
Resources**

Next Steps: Refine and Test

Funded through a CDC Cooperative Agreement



Principles: Maren Scheuner, MD, MPH
Lee Hilborne, MD, MPH
Ira M. Lubin, PhD

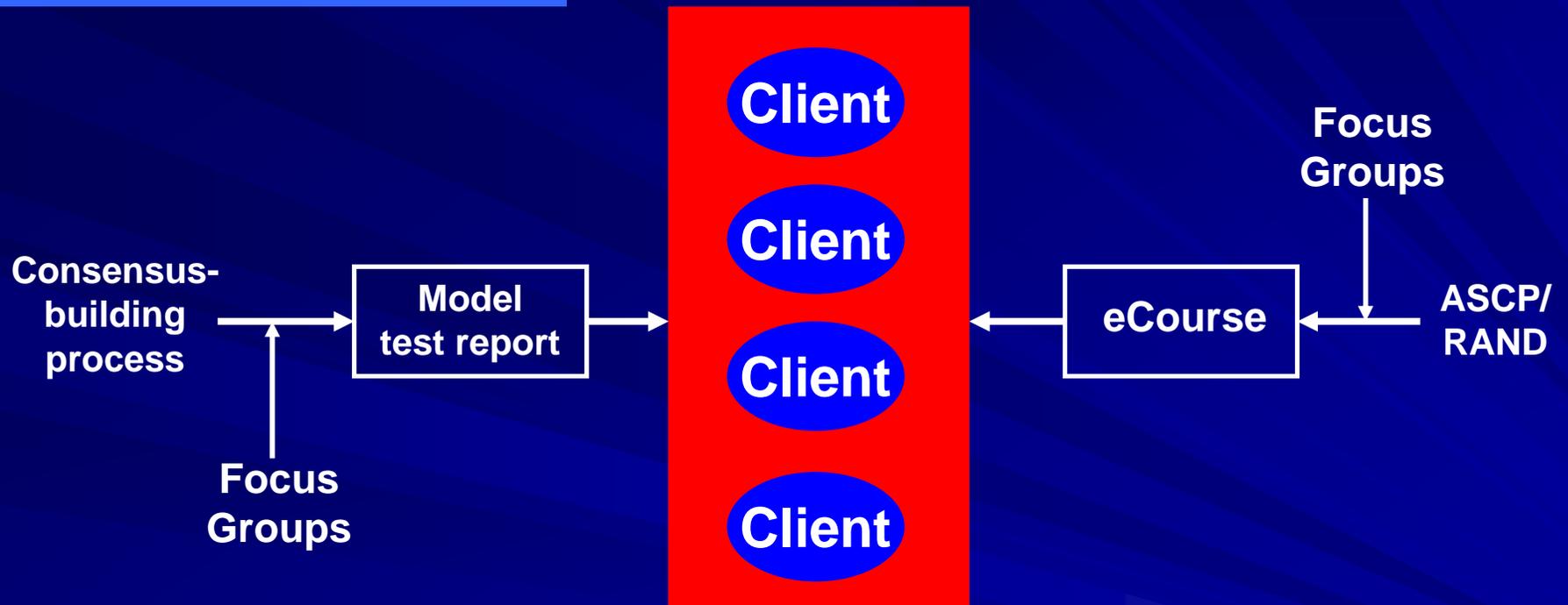


Suzanne Ziemnik
Becky Harris

- 1. Use a consensus-building process with our 28-member expert panel to:**
 - a) Identify model heritable disorders to study**
 - b) Develop Model Reports**
- 2. Assess whether the model report format communicates clinically important principles better than existing reports (focus groups and client survey)**
- 3. Develop a web-based CME course with embedded information resources as an aid to understanding test reports**

Process

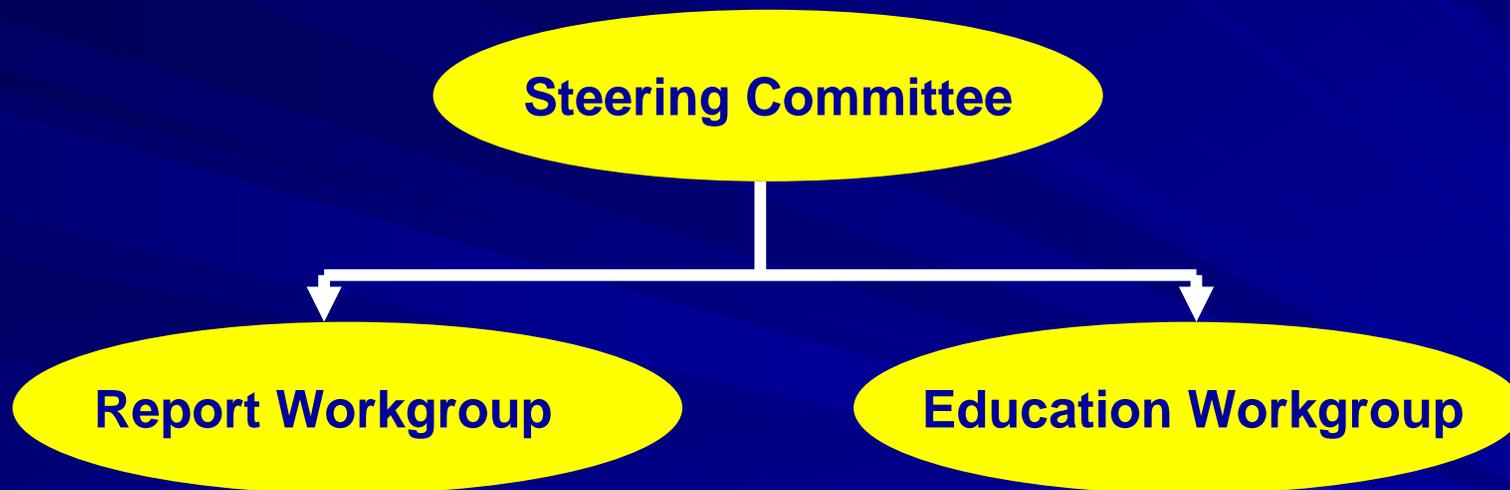
Survey
laboratory
clients
(Physicians)



Evaluation

Engage Partners

Clinicians, Laboratory Directors, Educators, IT Experts, Policy Makers, etc.



Developing Model Genetic Test Reports

- **Start with model developed for cystic fibrosis**
- **With expert panel use Delphi method to develop “generic” report format**
- **Focus groups to help resolve issues lacking consensus or majority opinion, and to inform model report**
- **Apply generic format to clinical genetic test scenarios**
 - **Factor V Leiden, hereditary nonpolyposis colon cancer, warfarin genotyping, Ashkenazi Jewish prenatal panel, fragile X, array comparative genomic hybridization for developmental delay/mental retardation?**
- **Engage professional groups for feedback and buy-in**

Consensus Building Process: Lessons Learned

- **The original framework (from the CF study) thought useful**
 - **Report should present information in a tiered, sequential format**
 - “Chunks” of information that flow logically
 - **Consisting of**
 - Patient data
 - Ordering clinician information
 - Test ordered (method, indication, specimen type, date sample collected and received)
 - Results & interpretation
 - Guidance
 - Supplemental information

However.....

Consensus Building Process: Lessons Learned

Differences regarding comprehensiveness

- Include data (e.g., family history, ethnicity/race, indication for testing) only when relevant to test interpretation

VERSUS

- Always present core data items regardless of relevance to interpretation as relevance may evolve, and relevance may differ depending on stakeholder

Differences regarding purpose

- The report should include clinical information and integrate that information with the test result that is patient-specific to allow the end-user to develop a management plan

VERSUS

- The report is a piece of patient data that provides concise information about the test and result that is not patient-specific; the ordering clinician would have to piece together other data that exist elsewhere to develop a management plan

Developing the eCourse

Primary audience: Physicians

- **ASCP/RAND team working with Education Workgroup to develop content, host, and offer CMEs**
 - Teach process for understanding reports
 - Key principles / concepts
 - Common vocabulary
 - Identify / provide access to information resources
 - Content: Orientation, Genetics 101, case-based learning
 - ASCP will implement, host, offer CME

Evaluation

Model Reports

- Pilot test of reports and eCourse (years 2 and 3)
- Evaluation of one model report (FVL) regarding its effectiveness in communicating key information through survey of laboratory clients

eCourse

- Participation
- Knowledge gained regarding key concepts
- CME evaluation will assess satisfaction with eCourse

Both

- Overall process for improving reporting / understanding
- Likelihood that this process can promote understanding and appropriate use of testing

Outcomes Sought:

Benefits to Laboratory Professionals and Clinicians

Establish evidence for the effective presentation of information, and assess influence of educational materials

Does the model report perform better than the existing standard? Using an ordinal scale, lab clients will rate ease of use relating to:

- 1. Finding the test result**
- 2. Understanding the laboratory interpretation**
- 3. Understanding the limitations of the test method**
- 4. Understanding the purpose and indication for the test**
- 5. Understanding the patient factors contributing to the interpretation**
- 6. Knowing the impact of the results for the patient and family**
- 7. Knowing what resources are available**

Summary

The project is designed to test and evaluate an Integrated approach to the reporting of molecular genetic test results essential for effective clinical decision making that is anticipated to be broadly applicable

Next Steps

Leveraging findings to the broader practice community



Our Next Frontier:
Information Technology
Clinical Decision Support



Questions for Discussion

- 1. Considering both molecular genetic testing and the broader arena of laboratory medicine, how should this work be leveraged to improve the provision and use of laboratory services?**
 - With regards to laboratory practice?**
 - With regards to clinical practice?**
- 2. With regards to this work, what would be helpful for CLIAC in developing recommendations to the Department of Health and Human Services for promoting effective reporting and use of test results?**

Thank you!

The Plan

