

# CAP Accreditation of Genetics Testing Laboratories

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# Overview

- Shared Goals
- CAP Accreditation Program
  - Molecular Pathology
  - Cytogenetics
- CAP Proficiency Testing
- CAP Recommendations



# Shared Goals

- Assure that tests being offered are analytically and clinically valid
- Assure patient safety and the public health
- Assure patient access to testing
- Allow innovation and continued improvement of Laboratory-Developed Tests



# CAP Accreditation Program

- The CAP Laboratory Accreditation Program is designed to assure that:
  - High complexity laboratory tests are provided by high quality labs that assure analytical and clinical validity of the tests they offer;
  - Laboratories have a patient safety plan in place;
  - Incremental improvement and innovation in laboratory testing is not impeded.



# CAP Accreditation

- CMS-approved accreditor
- Higher standard than CLIA
- Specialized inspector requirements for genetics
- Scientific Resource Committees develop specialty accreditation requirements
- Labs required to report changes to testing menu



# History of CAP Accreditation

- CAP began inspecting clinical laboratories in 1961
- Program initially voluntary
- CAP initiated the first Cytogenetics Checklist in 1976
- CAP initiated the first Molecular Pathology Checklist in 1993



# CAP Accreditation Requirements

- Inspections
  - On-site inspections by external evaluator required every two years;
  - CAP uses peer inspection teams of currently practicing laboratory professionals
- Inspection Tool
  - CAP uses Inspection Checklists to guide the inspectors
  - Checklists consist of 3,500 discipline-specific laboratory requirements



# CAP Standards Exceed CLIA

- Over half of CAP requirements (1,700 questions) are additional to CLIA minimum standard
- Example special disciplines not covered by CLIA
  - Forensic testing
  - Autopsy
  - Histology processing
  - Embryology
- Example sections within traditional disciplines beyond CLIA
  - Proficiency testing for non-regulated analytes
  - Computer systems
  - Lab safety & hygiene
  - Prenatal screening
  - Sweat chloride testing



# CAP Inspector Requirements

- Inspection of a genetics laboratory requires special knowledge of the science.
- The inspector should be an actively practicing molecular scientist familiar with the Checklist and possessing the technical and interpretive skills necessary to evaluate the quality of the laboratory's performance.



# CAP Inspector Training

- Live inspector training seminars
- Discipline-specific audio conferences
- On-line interactive training sessions
- Inspection Team Leader requirement for re-training every two years



# Genetics Accreditation Standards

- Assay validation
- Clinical validation\*
- Universal nomenclature\*
- Correlation with clinical information & other studies\*
- Recommendations for genetic counseling & further studies\*
- Turn-around time requirements\*

\* Exceed CLIA requirements



# CAP Standards Beyond CLIA

- Examples of questions from the Molecular Pathology Checklist:
  - Are the clinical performance characteristics of each assay documented, using either literature citations or a summary of internal study results?
  - Does the final report include an appropriate summary of the methods, the loci or mutations tests, the analytical interpretation, and clinical interpretation if appropriate?



# CAP Molecular Pathology Checklist

- Covers most aspects of clinical molecular testing including oncology, hematology, infectious disease, inherited disease, HLA typing, forensics and parentage applications.
- Testing that involves DNA/RNA probe hybridization or amplification constitutes molecular testing.



# Techniques with specific compliance requirements:

- Extraction & purification\*
- Amplification\*
- Restriction endonucleases\*
- Sequencing\*
- Detection\*
- Real-time PCR\*
- Arrays\*
- In-situ hybridization\*

\* Exceed CLIA requirements



# CAP Cytogenetics Checklist

- Covers Chromosome analyses
  - Amniotic fluid & chorionic villi
  - Non-neoplastic blood & fibroblasts
  - Neoplastic blood and bone marrow



# Techniques with specific compliance requirements:

- Cultures\*
- Cells counted\*
- Karyotypes\*
- Band-levels of resolution\*
- Fluorescence *In Situ* Hybridization (FISH)\*



\* Exceed CLIA requirements

# Accreditation Process

- If a deficiency is cited, lab must respond with corrective action within 30 days of on-site inspection
- Two-tier review process to determine adequacy of action plan and lab's ability to maintain sustained compliance
- Accreditation decision is rendered by a committee of lab experts
- On alternate years, self evaluation is required



# CAP Accredited Labs

- 6600 CAP Laboratories Accredited
- 250 labs with Cytogenetics discipline
- 700 labs with Molecular Pathology discipline
- 98 of the Top 100 Hospitals
- Majority of the large commercial reference labs, i.e., Quest & Lab Corp



# Most Common Deficiencies - Molecular Pathology

- In cases where there is no commercially available PT, does the laboratory at least semiannually 1) participate in external PT, or 2) exercise an alternative performance assessment system for determining the reliability of analytic testing? [3.9%\*]
- Are temperatures checked and recorded appropriately for equipment in which temperature is critical? [3.5%\*]
- Is there a summary statement, signed by the laboratory director or designee, documenting review of validation studies and approval of the test for clinical use? [3.3%\*]

\*% of inspections deficiency cited

Deficiencies must be corrected for accreditation.



# Most Common Deficiencies - Cytogenetics

- Is the final report for tests requiring rapid reporting of results available within 7 calendar days of specimen receipt in at least 90% of cases? [7.6%\*]
- Is the final report for neoplastic bloods and bone marrow analyses provided within 21 calendar days of specimen receipt in at least 90% of cases? [6.8%\*]
- Are reagents and solutions properly labeled, as applicable and appropriate? [Missing at least one element - 4.2%\*]

\*% of inspections deficiency cited

Deficiencies must be corrected for accreditation.



# CAP Proficiency Testing

- Allows laboratories to regularly evaluate their performance and improve the accuracy of the patient results
- Provides individual laboratories with unknown specimens for testing
- Participants analyze the specimens and return the results to the CAP for evaluation
- Results evaluated using comparable peer groups from comprehensive database of laboratories

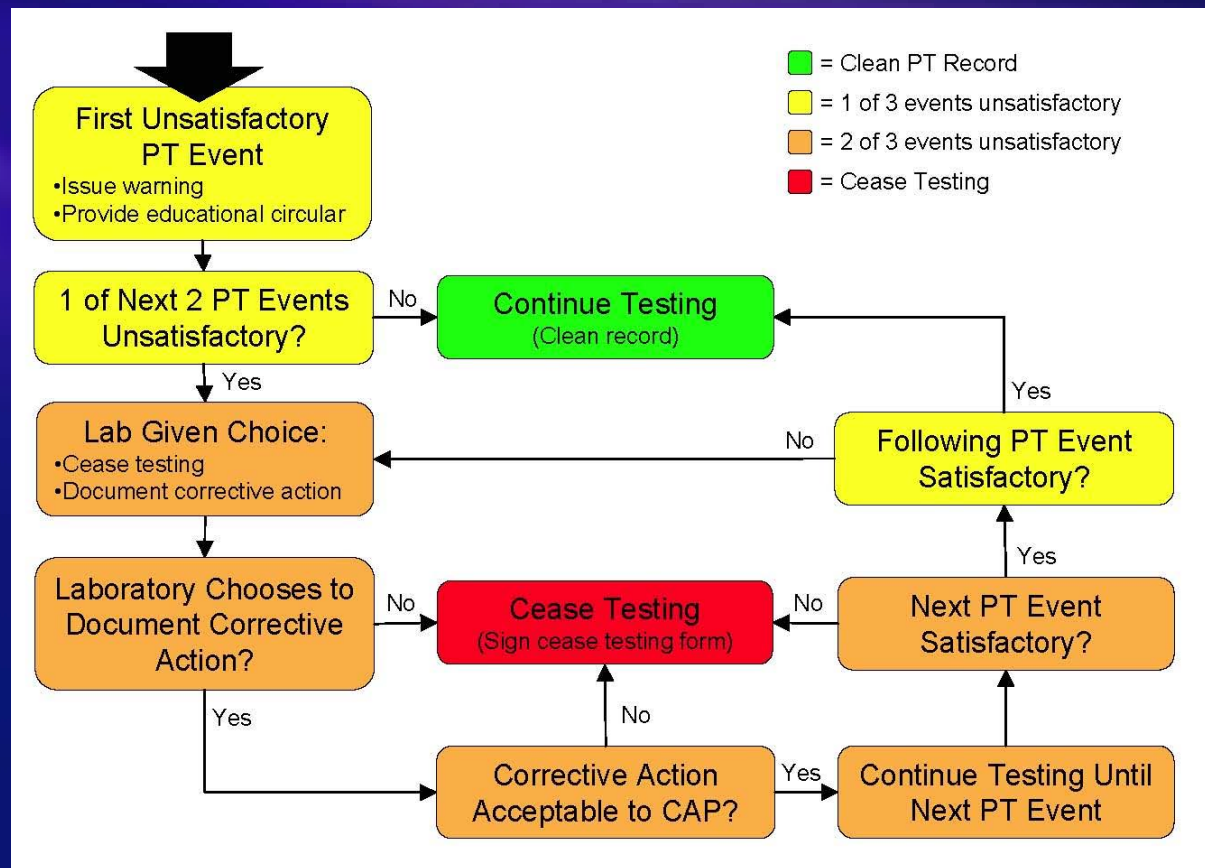


# CAP Proficiency Testing for Genetics Tests

- CAP contribution
- Products available
  - Chromosome abnormality identification
  - FISH using chromosome-specific DNA probes
  - Biochemical genetics for metabolic diseases
  - Molecular analysis of lymphoma & leukemia



# PT Monitoring by Accreditation Program



# 2006 MGL PT Performance

Analyte	2006A correct	2006A total	2006A % correct	2006B correct	2006B total	2006B % correct	2006 A+B % Correct
FVL	778	784	0.992	831	834	0.996	0.994
FVL interp	782	786	0.995	833	835	0.998	0.996
PT	758	764	0.992	789	798	0.989	0.990
PT Interp	756	765	0.988	799	808	0.989	0.989
MTHFR	454	458	0.991	476	482	0.988	0.989
MTHFR Interp	424	457	0.928	472	491	0.961	0.945
FMR1	223	229	0.974	256	260	0.985	0.980
FMR Status	245	246	0.996	261	265	0.985	0.990
FMR Interp	247	247	1.000	262	267	0.981	0.990
PW Interp	169	170	0.994	178	180	0.989	0.991
HH	337	339	0.994	348	348	1.000	0.997
HH Interp	319	338	0.944	341	343	0.994	0.969
DMD	21	21	1.000	21	24	0.875	0.933
Hb S/C	72	72	1.000	72	75	0.960	0.980
HB S/C Interp	72	72	1.000	72	75	0.960	0.980



# Conclusion

The CAP Laboratory Accreditation Program can serve as a model to improve the quality of laboratory-developed tests thru the accreditation process in a way that:

- Improves patient care
- Protects the public's health
- Does not stifle innovation and test improvement



# CAP Recommendations

- Private organizations and laboratories should continue to build on their work with CLIA over the last 15 years developing quality systems.
- CAP believes that the goal of assuring analytical and clinical validity for all high complexity laboratory tests can best be achieved through the CLIA inspection process.
- In order to achieve this goal, CAP understands that statutory changes to CLIA may be needed.





Questions!