Regulatory Framework for Assuring Quality of Cytology Screening

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Introduction

- Law
- Regulations
  - Quality Control
  - Proficiency Testing
- Cytology PT Chronology
- CLIA Approved Programs
- Process Overview – 2007 NPRM
Periodic confirmation and evaluation of the proficiency of individuals involved in screening or interpreting cytological preparations, including announced and unannounced on-site proficiency testing of such individuals, with such testing to take place, to the extent practicable, under normal working conditions.
• Contain specific requirements for Cytology
  ❖ Quality control – Subpart K
  ❖ Proficiency testing – Subpart H and Subpart I
    o Subpart H – what the laboratory must do
    o Subpart I – what the proficiency testing (PT) program must do
  ❖ Personnel – Subpart M

Regulatory Components Must Fit

- Compliance, fees
- Personnel
- Quality Assurance
- Cytology
- Proficiency Testing
- Inspection
All the parts are required for quality performance
Subpart K---Quality Control

• Staining
  - Policies and procedures in place
  - Measures to prevent cross contamination

• Control procedures
  - 10% random review of negative gynecologic cases (including high risk)
  - Cytology/Histology correlation
  - 5 year retrospective review of all HSIL cases
  - Evaluation of case reviews of each individual vs. laboratory’s overall statistical values

• Workload limits
  - Based on individual performance/review of statistics
  - Reassessed every 6 months
  - Not to exceed 100 slides/24 hours
• Slide examination and reporting
  ❖ Technical supervisor confirms all reactive/reparative and above and non-gynecological slides
  ❖ Report contains narrative descriptive nomenclature
  ❖ Unsatisfactory specimens and slides are reported
  ❖ If corrected report is issued, states basis for correction

• Record and slide retention
• Documentation of testing and control procedures
• Periodic inspection of cytology laboratories by cytology personnel
Subpart H---PT Laboratory

The laboratory must ensure:

- Each individual performing gynecologic cytology examinations is enrolled in a program
- Each individual obtains a passing score (90%)
- Required remedial actions are taken following any failure of a testing event
The PT program must:

- Submit an application by July 1 for approval and testing next calendar year
- Be a non-profit organization
- Provide annual testing and retesting (for scoring <90%)
- Provide announced and unannounced testing
- Compile 10 and 20 glass slide test sets
  - Each slide must have consensus of 3 pathologists
  - Each test set must include one slide from each category
- Score tests using CLIA scoring for pathologists (TS) and cytotechnologists
- Provide test reports to participants, laboratories, CMS
- Maintain documentation of testing
Testing Sequence

• Initial - 10 slide test
• Retest - 10 slide test
• Second retest – 20 slide test
• Third retest – 20 slide test
# Testing Schematic

<table>
<thead>
<tr>
<th>Test</th>
<th>Individual who scores &lt;90% must....</th>
<th>Laboratory must..</th>
</tr>
</thead>
<tbody>
<tr>
<td>First test</td>
<td>retest within 45 days</td>
<td>Enroll each individual Schedule retest</td>
</tr>
<tr>
<td>10 slides, 2 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second test</td>
<td>retest within 45 days</td>
<td>Provide remedial training Schedule retest</td>
</tr>
<tr>
<td>10 slides, 2 hrs</td>
<td>Remedial training</td>
<td></td>
</tr>
<tr>
<td>Third test</td>
<td>complete 35 hrs continuing education Retest</td>
<td>Assure 35 hrs continuing education Ensure ceases to examine slides until passes retest Schedule retest</td>
</tr>
<tr>
<td>20 slides, 4 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourth test</td>
<td>cease examining gyn slides</td>
<td>Assure 35 hrs continuing education Ensure ceases to examine slides until passes retest Schedule retest</td>
</tr>
<tr>
<td>20 slides, 4 hrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• **A Unsatisfactory** for diagnosis due to:
  - Scant cellularity
  - Air drying
  - Obscuring material (blood, inflammatory cells, or lubricant)

• **B Normal or Benign Changes**--includes:
  - Normal, negative or within normal limits
  - Infection other than Human Papillomavirus (HPV) (e.g., Trichomonas vaginalis, changes or morphology consistent with Candida spp., Actinomyces spp. or Herpes simplex virus)
  - Reactive and reparative changes (e.g., inflammation, effects of chemotherapy or radiation)

• **C Low Grade Squamous Intraepithelial Lesion**--includes:
  - Cellular changes associated with HPV
  - Mild dysplasia/CIN-1

• **D High Grade Lesion and Carcinoma**-- includes:
  - High grade squamous intraepithelial lesions which include moderate dysplasia/CIN-2 and severe dysplasia/carcinoma in-situ/CIN-3
  - Squamous cell carcinoma
  - Adenocarcinoma and other malignant neoplasms.
Cytology PT Chronology

• October 1988 - CLIA Law mandated proficiency testing (PT) for Cytology personnel
• May 1990 – Proposed Rule Published
• February 1992 - CLIA Regulations require glass slide PT (GSPT)
• December 1993 - CLIAC recommended pursuing computer-based options
Cytology PT Chronology

• September 1994 - Awarded cooperative agreements to ASCP, NEMC, and TJ U to develop computer-based testing prototypes
  ❖ Multiple digital images – not a virtual slide
  ❖ Did not test locator skills per participant evaluations
January 1995 - Awarded contract to Analytical Sciences, Inc. (ASI)

- Compared GSPT and CBPT scores to recent work performance score
- Work performance score equals evaluation of the rescreen of 500 slides
- CBPT model was CytoView I (CDC prototype virtual slide program)
July 1997 - Completed ASI study
  - Correlation GSPT and rescreen = 0.30
  - Correlation CBPT and rescreen = 0.29

Low probability of observing correlation by chance (<5 in 1000)
ASI Study Criticism

- Correlation is low due to measurement uncertainty with 10 items
- Direct comparison of CBPT and GSPT not performed
- Did not evaluate work place performance of pathologists
Cytology PT Chronology (contd.)

• February 2002 - Maryland Study
  - Compare performance on GSPT and CBPT
  - Pathologist/cytotechnologist team testing
  - CBPT was CytoView II (CDC patented virtual slide program)
Maryland Study Results

Comparison of Individual (N=111) Performance on MCPTP and CytoView™II

- 70% higher MCPTP score
- 33% higher CytoView™II score
- 8% Equal on both tests
Maryland Study Conclusion

- Each slide (glass or virtual) must be field validated by cytotechnologists and pathologists.
- If field validation and CLIA referencing of virtual slides is comparable to glass slides, computer-based testing can be equivalent to glass slide testing.

CLIA Approved PT Programs

• 1995 - State of Maryland Cytology Proficiency Testing Program
• 2005 - Midwest Institute for Medical Education, Inc.
• 2006 - College of American Pathologist
• 2006 - American Society of Clinical Pathologists (through acquisition of MIME program)
Process Overview for Developing NPRM

- Focus is on developing regulation - not on changing the statute
- Must go through the rulemaking process
- Solicit comments from cytology organizations
- Create a CLIAC workgroup
  - Consider the comments
  - Report findings to CLIAC
- Obtain input from PT providers
- CLIAC makes recommendations to HHS
- CDC/CMS develop proposed rule
Don’t over-compensate!
Cytology Requirements for PT in the 1990 Proposed Rule - 1992

- 2 PT events per year – changed to 1 in 1992
- 20 slide test – changed to 10 in 1992
- Scoring system based on awarding -1 to 2 points per slide response and adjusted to a 100 point score – changed in 1992 rule
- Re-screen 500 negative slides if cytotechnologist fails first event – changed in 1992 rule
Proficiency Testing Variables

• Difficulty of challenges

• Number of challenges per event

• Number of events in the “grading” interval

• Scoring scheme versus reasonable performance

• Distribution of slides representing various pathologies per event...and over events
Probability of Passing

Pr (passing PT)

Theoretical Competence

3/4  5/2  5/3  5/4
High Performing Cytology Screening