



Quality Control Requirements for Microbiology Identification Systems

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Issue

What are the appropriate CLIA quality control (QC) procedures for microbiology identification (ID) systems (bacterial and yeast) that utilize panels or cards containing multiple substrates/reagents to generate the organism identification?



Background



QC Requirements for Microbiology Identification (ID) Systems

- CLIA regulations require the laboratory to check each batch (in-house), lot number (commercial) and shipment of reagents, discs, stains, antisera and **identification systems** for positive and negative reactivity and graded reactivity, if applicable
- CLIA defines ID systems as “systems using two or more substrates or reagents, or a combination”



QC requirements for microbiology identification (ID) systems (cont)

Varying numbers of control organisms need to be tested to check positive and negative reactivity for each substrate/reagent on ID systems that include multiple reactions per panel



Commercially Available Microbiology ID Systems

Manufacturers	6
Test Systems	11 Manual 2 Semi-automated 7 Automated
Identification Panels	56
Substrates/Reagents per Panel	2-95
QC Organisms Required per Panel	4-8
Approximate Cost per Panel	\$4-\$16



FDA Process

- In 1998, FDA ceased 510(k) premarket performance evaluations of automated and manual microbiology ID systems
- FDA does not review QC protocols or labeling for microbiology ID systems to meet CLIA requirements



Current Considerations

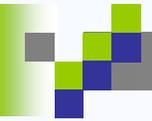


Manufacturer Request

- Two letters have been submitted to CLIAC suggesting QC requirements for Vitek ID products are excessive
- For Vitek products, the manufacturer recommends one QC microorganism to check each shipment/lot number of ID cards
- Previously, the manufacturer recommended testing up to eight microorganisms per shipment of ID cards to check positive/negative reactions for each substrate/reagent



Determine Appropriate QC



- For each panel/card, is it necessary to check each substrate/reagent for positive/negative reactivity with each shipment/lot number?
- Is there an alternative to testing each reagent/substrate?
- Should a minimum number of control organisms be specified?



Process for Consideration

Since CLIA QC requirements must be general and can not be specific to a particular manufacturer or test system, how should appropriate QC be determined?



Previous Surveys



American Society for Microbiology (ASM) Proposal

- In 1995-1996 ASM asked CLIAC to consider the appropriateness of CLIA microbiology QC requirements
- ASM agreed to collect QC performance data and share the results with CLIAC
- Based on survey data reflecting low failure rates, ASM suggested a decrease in frequency for QC testing of reagents and stains



ASM Data Collection

- ASM conducted two surveys on QC testing failures for commercial microbiology reagents and stains
- 8/30/95, 9/25/96 - Data were presented to CLIAC representing
 - ❖ 304 clinical microbiology laboratories
 - ❖ 14,731 lots of 21 different tests



ASM Survey Findings

- Failure rate data suggested CLIA QC testing frequencies for microbiology reagents/stains were excessive
- Based on survey results, ASM proposed laboratories be required to test only new lot numbers of commercial reagents that had a 98 percent or greater success rate



Regulatory Change

1/24/03 - Based on data provided by ASM, CLIA regulations were revised to decrease frequency of QC testing for commercial microbiology reagents/stains



Changes in Microbiology QC Requirements

Regulations Prior to 2003	Current Regulations
Bacteriology	
Check positive/negative reactivity – Daily: reagents and DNA probes Weekly: bacitracin, optochin, ONPG, X, and V discs or strips Monthly: antisera	Check positive/negative reactivity – Each batch, lot number and shipment of reagents, disks, stains, antisera and identification systems. In addition, check antisera every six months after opening or preparation
Mycology	
Check positive/negative/intended reactivity - Daily: lactophenol cotton blue Weekly: fungal identification tests	Check positive/negative/intended reactivity - Each batch, lot number and shipment of reagents, disks, stains (lactophenol cotton blue), antisera, and identification systems



Future Plans



Need for Data

- CDC is working with ASM to gather QC performance data for microbiology ID systems
- Survey is being planned to include—
 - ❖ Cross section of microbiology laboratories
 - ❖ Instruments, semi-automated, and manual methods
 - ❖ QC performance data from all manufacturers of bacterial and yeast ID systems



Use of Data

- Data will be used to determine
 - ❖ Stability
 - ❖ Error rates
 - ❖ Whether it is necessary to check each reagent/substrate in ID panels for positive/negative reactivity to ensure the correct organism ID
- If data support changing the QC procedures, these revisions will be published in the CLIA interpretive guidelines and disseminated to laboratories

