

# Update of the Biopsy QC Manual

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## Who

- ACR Subcommittee on Mammography Physics
  - Chair: Tom Ruckdeschel MS
  - The rest of us
    - Michael Bonvento PhD, William Geiser MS, Allen Goode MS, Katie Hulme MS, Thomas Moore MS, James Norweck MS, Liane Philpotts MD, Margaret Szabunio MD, Carley Williams MS, Roland Wong ScM, Michael Yester PhD
- ACR Staff
  - Pamela Platt, Scott Irving, Dustin Gress, Theresa Branham, Krista Busch, Jasmine Mirabile

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## Layout

- Should be familiar 2018 DM QC Manual – 1999 SBBQC
  - Physicians Section
  - Technologists Section
  - Medical Physicists Section



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## Supporting Documents

- ACR Practice Parameter for the Performance of Stereotactic/Tomosynthesis-Guided Breast Interventional Procedure - Revised 2020
- ACR-AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of Stereotactic/Tomosynthesis-Guided Breast Biopsy Procedures - New 2020
- 1999 Stereotactic Breast Biopsy Quality Control Manual
- 2018 Digital Mammography Quality Control Manual

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## Physicians Section

- Major Components
  - Responsibilities
    - Supervising Radiologist
    - Physician
    - QC Technologist
    - Medical Physicist
  - Definitions of Quality Assurance and Quality Control
  - The need for Quality Assurance and Quality Control

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## Technologists Section

- QC Technologist Responsibilities
- Other Technologist Responsibilities
- Quality Control Tests and Frequencies
  - Objective of each test
  - Required Frequency
  - Test Procedure
  - Spread Sheets for each test to assist in documentation

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## Localization Accuracy or Daily Accuracy Test

- Manufacturers required test
- How to test accuracy if the manufacturers phantom is lost or broken

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## Medical Physicists Section

- Medical Physicists Responsibilities
- Quality Control Tests and Frequencies
- Test Objectives
- Basic Procedure for performing each test
- Tables describing testing for prone tables and up right add on systems
- Equipment Evaluations or Acceptance Testing vs. Annual Testing
- Physicist oversight vs. Physicist on site
- Develop spread sheets for each test to assist with documentation

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## Table of Required Tests for Acceptance Testing and Annual Testing

- All tests to be done at Acceptance Testing if they apply
- Some tests are optional at annual testing

Test	Minimum Frequency	Corrective Action Timeframe*
<b>Medical Physicists Tests</b>		
1. Image Quality	Acceptance and Annual	Before clinical use
2. X-ray Evaluation	Acceptance and Annual	Before clinical use
3. DBT Evaluation	Acceptance and Annual	Within 30 days
4. Spatial Resolution	Acceptance and Annual	Within 30 days
5. DBT Volume Coverage	Acceptance and Annual	Within 30 days
6. Automatic Exposure Control System Performance	Acceptance and Annual	Within 30 days
7. Average Glendale Data	Acceptance and Annual	Within 30 days
8. Unit Checklist	Acceptance and Annual	Critical items: before a clinical use, non-critical items: within 30 days
9. Verification of Localization Accuracy	Acceptance and Annual	Before clinical use
10. Acquisition Workstation Monitor QC	Optional and Annual	Within 30 days, before clinical use for prone
11. Evaluation of State's Technologist QC Program	Acceptance and Annual	Within 30 days
12. Manufacturer's Calibrations (if applicable)	N/A	Manufacturer's instructions
<b>Acceptance, Post-Repair, or Troubleshooting Tests ONLY</b>		
Commission	Acceptance Post Repair or Troubleshooting	Within 30 days
Compression Thickness Indicator Accuracy	Acceptance Post Repair or Troubleshooting	Within 30 days
Evaluation of Compression Force	Acceptance Post Repair or Troubleshooting	Within 30 days
Unit Accuracy and Reproducibility	Acceptance Post Repair or Troubleshooting	Within 30 days**
Beam Quality (Half-Value Layer) Assessment	Acceptance Post Repair or Troubleshooting	Within 30 days**
Beam Quality (Half-Value Layer) Assessment	Troubleshooting	Before clinical use

\*Not tests performed as part of the FFDAM survey (for an alternative), corrective action timeframe is specified by the QC manual unless the FFDAM supervisor has the experience within QC manual.  
\*\*When the test is performed for an acceptance evaluation or post-repair evaluation, all failures should be corrected before clinical use, but may be corrected within 30 days. When the test is performed for troubleshooting, all failures must be corrected within 30 days.

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## Tests required for Prone Tables or Standalone Systems

- Mimics the DM QC Manual

Test	Image Guidance Capability		
	Stereo-Guided Biopsy	DBT-Guided Biopsy	
<b>Medical Physicists Tests</b>			
1. Image Quality	✓	✓	
2. X-ray Evaluation	✓	✓	
3. DBT Evaluation	✓	✓	
4. Spatial Resolution	✓	✓	
5. DBT Volume Coverage	✓	✓	
6. Automatic Exposure Control System Performance	✓	✓	
7. Average Glendale Data	✓	✓	
8. Unit Checklist	✓	✓	
9. Verification of Localization Accuracy	✓	✓	
10. Acquisition Workstation Monitor QC	✓	✓	
11. Evaluation of State's Technologist QC Program	✓	✓	
12. Manufacturer's Calibrations (if applicable)	✓	✓	
<b>Acceptance, Post-Repair, or Troubleshooting Tests ONLY</b>			
Commission	✓	✓	
Compression Thickness Indicator Accuracy	✓	✓	
Evaluation of Compression Force	✓	✓	
Unit Accuracy and Reproducibility	✓	✓	
Beam Quality (Half-Value Layer) Assessment	✓	✓	

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## Additional testing for add on biopsy systems if following DM QC Manual

- No need to repeat every test if already done when testing the system for MQSA

Test	Image Guidance Capability		
	Stereo-Guided Biopsy	DBT-Guided Biopsy	
<b>Medical Physicists Tests</b>			
1. Image Quality	✓	✓	NA*
2. X-ray Evaluation	✓	✓	NA*
3. DBT Evaluation	✓	✓	NA*
4. Spatial Resolution	✓	✓	NA*
5. DBT Volume Coverage	✓	✓	NA*
6. Automatic Exposure Control System Performance	✓	✓	NA*
7. Average Glendale Data	✓	✓	NA*
8. Unit Checklist	✓	✓	NA*
9. Verification of Localization Accuracy	✓	✓	NA*
10. Acquisition Workstation Monitor QC	✓	✓	NA*
11. Evaluation of State's Technologist QC Program	✓	✓	NA*
12. Manufacturer's Calibrations (if applicable)	✓	✓	NA*
<b>Acceptance, Post-Repair, or Troubleshooting Tests ONLY</b>			
Commission	✓	✓	NA*
Compression Thickness Indicator Accuracy	✓	✓	NA*
Evaluation of Compression Force	✓	✓	NA*
Unit Accuracy and Reproducibility	✓	✓	NA*
Beam Quality (Half-Value Layer) Assessment	✓	✓	NA*

\*Not already evaluated during FFDAM unit survey.

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## Testing for add on systems if following manufacturers QC manual

- Some additional testing if the add on system supports DBT guidance


Test	Image Guidance Capability		
	Stereo-Guided Biopsy	DBT-Guided Biopsy	
<b>Medical Physicists Tests</b>			
1. Image Quality	✓	✓	NA*
2. X-ray Evaluation	✓	✓	NA*
3. DBT Evaluation	✓	✓	NA*
4. Spatial Resolution	✓	✓	NA*
5. DBT Volume Coverage	✓	✓	NA*
6. Automatic Exposure Control System Performance	✓	✓	NA*
7. Average Glendale Data	✓	✓	NA*
8. Unit Checklist	✓	✓	NA*
9. Verification of Localization Accuracy	✓	✓	NA*
10. Acquisition Workstation Monitor QC	✓	✓	NA*
11. Evaluation of State's Technologist QC Program	✓	✓	NA*
12. Manufacturer's Calibrations (if applicable)	✓	✓	NA*
<b>Acceptance, Post-Repair, or Troubleshooting Tests ONLY</b>			
Commission	✓	✓	NA*
Compression Thickness Indicator Accuracy	✓	✓	NA*
Evaluation of Compression Force	✓	✓	NA*
Unit Accuracy and Reproducibility	✓	✓	NA*
Beam Quality (Half-Value Layer) Assessment	✓	✓	NA*

\*Not already evaluated during FFDAM unit survey.  
\*\*Must be performed. (Test required by vendor QC program)

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### Tomosynthesis Option

- QC for tomosynthesis is in the manual for now
- Accreditation program may not include it right away



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### Image Quality

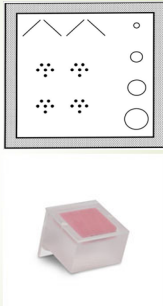
- Will include all three phantoms
  - "Mini" Phantom
  - Old ACR Accreditation Phantom
  - New DM QC Accreditation Phantom



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### Mini Phantom

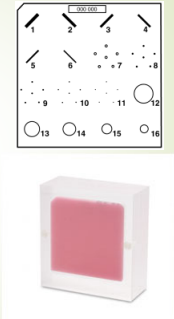
- Required minimum score
  - 2.0 fibers
  - 2.0 speck groups
  - 2.0 masses



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### Old ACR Phantom

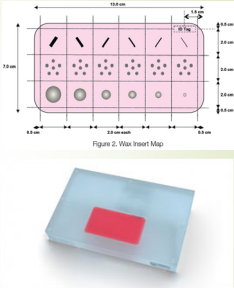
- Required minimum score
  - 4.0 fibers
  - 3.0 speck groups
  - 3.0 masses



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### DM QC Phantom

- Required minimum score
  - 2.0 fibers
  - 3.0 speck groups
  - 2.0 masses



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### Average Glandular Dose

- Use the Dance method for estimating dose
  - Include a scout view and a tomosynthesis view
  - Maintain the 3.0 mGy limit

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## Verification of Localization Accuracy

- Same test procedure
- If the technologist is not available to perform the test then use something like Face Time, Zoom or WebEx to verify that the technologist is able to hit a target!

