The American College of Radiology Radiography Radiology Radiography Radiology Radiography Radiology Radiography
and Fluoroscopy Accreditation Program – an Overview
Robert L. Dixon
Wake Forest University
Chest Accreditation Program Killed!
Modules-

Chest Radiography
General Radiography
Fluoroscopy
Equipment not included

- dedicated head units
- standing extremity units
- dental units
- portable c-arm units
- bone density units
- dedicated cystography units
- dedicated vascular and cardiac interventional units
- dedicated magnification units
- lithotripter units
Required Clinical Image Submissions

- Abdomen
- Chest
- Cervical Spine
- Elbow
- DCBE Spot film
Phantom Image Submission

- INCLUDE ALL IMAGE RECEPTOR ASSEMBLY - Use Clinical Technique for chest, abdomen, and DCBE
- Chest Phantom/wall bucky
- Abdomen Phantom/ table bucky
- Abdomen Phantom/Spot film device
Phantom Image Evaluates

- Minimum detectable contrast(%)  
- Low contrast resolution(contrast - detail)  
- High contrast resolution  
- Optical density(film)  
- Entrance skin dose- dosimeter
Phantom Design
Directives
Phantom Design Directives

- A single modular phantom for Chest, General Radiographic, Fluoro, and Interventional
- Simple enuff for techs to use
- "Cheap" enough for each facility to own
Wisconsin Phantom
North Carolina Phantom
**Radiography/Fluoroscopy and Interventional Accreditation Phantom**

**Side View**

<table>
<thead>
<tr>
<th>Fluoro (undertable tubes)</th>
<th>Spot (undertable tubes)</th>
<th>Interventional (overtable tube)</th>
<th>Abdomen (overtable tube)</th>
<th>Chest (horizontal tube)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Acrylic = 19.3 cm</strong></td>
<td>4.1 cm</td>
<td>4.1 cm</td>
<td>4.1 cm</td>
<td>7.6 cm</td>
</tr>
<tr>
<td>7.6 cm</td>
<td>7.6 cm</td>
<td>7.6 cm</td>
<td>7.6 cm</td>
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</tr>
<tr>
<td>7.6 cm slot block with a slot to accept a 2.5 x 15.3 cm thick artery block. The artery block is commercially available from Nuclear Associates.</td>
<td>7.6 cm</td>
<td>7.6 cm</td>
<td>7.6 cm</td>
<td>7.6 cm</td>
</tr>
</tbody>
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**Top View**

- **4.1 cm block**
  - 25 cm
  - 25 cm
  - The distance from the center of the block to the lead markers is 7 cm

- **Test plate object**
  - 25 cm
  - Mesh patterns and low contrast holes (centered)

- **Small aluminum disk** (6 cm from center of Test plate object and 12.5 cm from adjacent sides)

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"Hockey Puck"

Test Tool: Plastic thickness = 0.34"

High Contrast Mesh lines per inch:
A-80 lpi
B-12 lpi
C-16 lpi
D-20 lpi
E-24 lpi
F-30 lpi
G-40 lpi
H-50 lpi
I-60 lpi

Aluminum Disk
0.25" thick
2" diameter

Low Contrast Holes in aluminum disk:
each diameter = 0.375"

Hole Depths:
1  0.068"
2  0.049"
3  0.035"
4  0.025"
5  0.018"
6  0.0126"
7  0.0091"
8  0.0063"
9  0.0040"

(meshes arranged in incremental order; lines angled at 45 degrees.)
Contrast-Detail Test Object

<table>
<thead>
<tr>
<th>Hole Depth (in)</th>
<th>7/32 dia (in)</th>
<th>5/32</th>
<th>7/64</th>
<th>5/64</th>
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<tbody>
<tr>
<td>0.06</td>
<td></td>
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<tr>
<td>0.05</td>
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<td>0.04</td>
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<td>0.03</td>
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<tr>
<td>0.02</td>
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<tr>
<td>0.015</td>
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</tbody>
</table>

3 cm

7 cm

3/8 in thick
Abdomen Phantom
Spot Film
Fluoro Equipment

- Image intensifier with at least a 9” FOV
- kVp > 100
- Automatic Brightness Control
- Spot film device
The Medical Physicist must provide real-time fluoro image performance data using Abdomen phantom configuration.
Fluoro-Medical Physicist

- Resolution
- Minimum % contrast detectable
- Entrance Exposure rate
Required QC Tests

- Technologist - daily to annually

- Physicist - annually
Technologist QC Tests

- Processor QC - daily
- Darkroom Cleanliness - Weekly
- Phantom Image - Quarterly
- Viewboxes - Quarterly
- Repeat Analysis - Quarterly
- Darkroom fog - Semiannually
- Screen cleanliness - Annually
Physicist QC- annual

- Phantom image quality evaluation (score and artifacts)
- Radiographic - chest/ abdomen
- Fluoro - real time
- Fluoro - Spot film
- ESE for all the above
Pilot Program