FUJI Computed Radiography
Specifications and Quality Assurance

George Spahn Director of Image Quality
FUJIFILM Medical Systems USA
System Overview

- Phosphor BasedComputed Radiography
- Cassette Based
  - Single Plate
  - Cassette Stacker
  - Scoliosis & Long-leg
  - Ultra High Resolution (50 micron)
- Cassetteless Systems
  - Table and Upright
  - Energy Subtraction
Specifications

- 100 micron resolution (standard)
- 50 micron mode (ClearView-CS)
  - For 18x24 and 24x30 cm sizes
- Exposure Range 0.01 to 100mR
- Multispeed System (exam limited)
  - General Studies typical 300 to 400
  - Energy Subtraction Chest typical 200
  - Low Dose Studies typical 600 to 900 (Noise limited)
  - Mammography* typical 100 to 150

*Pending FDA approval
Imaging Plate Technology

- ST and HR Single side emission
- ST an HR Dual side emission
  - DQE improvement of 30-40%
- Dual Side Emission IP used in
  - Most Cassetteless Upright Readers
  - Cassetteless Table Readers
  - Chest ES Upright Reader
  - 50 micron Imaging
IP Reading Technology and Throughput

- Standard 100 micron Point Scan
  - XG5000 109 14x17/hr

- 50 micron Point Scan
  - ClearView-CS 60 24x30/hr

- New Line Scan Technology (100 micron)
  - Velocity Cassetteless Upright and Table
  - 240 17x17/hr
Image Processing Technology

- Dynamic Range Compensation
- Multi objective Frequency Processing
- Tomographic (streaking) Artifact Suppression
- Flexible Noise Control
- Grid Pattern Removal
- Pattern Enhancement for Mammography
- Scoliosis and Long-leg Stitching
Exposure Index

- S# (sensitivity number)
  - Range from 2 (100mR) to 20,000 (0.01mR)
- Formula
  - $S# = \frac{200}{\text{exposure (mR)}}$
- Calibration Process
  - 80 kVp >72” SID 1 mR no added filtration
  - $S# = 200$
FCR Reader QA Options

- **1 Shot Phantom**
  - Simple to Use
  - Inexpensive
  - Visual Evaluation

- **1 Shot Phantom Plus**
  - Quantitative Testing
  - Software Analysis and Reporting

- Both Systems Designed in Support of AAPM TG-10
FCR 1 Shot Phantom

- Relative Sensitivity
- Shading Test
- Contrast Evaluation
- Sharpness Test

- Laser Jitter Test
- Image Noise/Artifact
- Primary Erasure
- Measurement Accuracy

- Exposure Linearity Test
FCR 1 Shot Plus System

- Advanced FCR Reader QA Program
  - New FCR 1 Shot Plus Phantom and Software
    - **AUTOMATED TESTS**
      - Relative S#  Shading  Noise
      - Laser Jitter  MTF  Linearity
      - Size Accuracy  Erasure  Darknoise
    - **VISUAL EVALUATION**
      - High Contrast  Low contrast  Artifact
Display System QA

- New Automated Printer QA
  - AutoCal Options
  - Grayscale and geometric test patterns
  - Reporting System
- New Automated Monitor QA
  - Viewing Conditions, Monitor Calibration, Grayscale and Geometric test Pattern
  - Reporting System
    - Reader, Monitor and Printer programs available Oct 04
Thank You

George Spahn
FUJI Medical Systems