Measuring Patient Exposure in Interventional Radiology

GAFCHROMIC® XR-R
A Wide-Area Dosimetry Film to Assess Peak Skin Dose (PSD)

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International Specialty Products

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Our Credentials

- ISP develops and manufactures GAFCHROMIC® radiochromic films
- Instantaneous color change when exposed to ionizing radiation
  - Not light sensitive
  - No development, no chemicals
- Radiochromic film is used to image and measure radiation fields
  - Principal uses are in radiology and radiotherapy

"You don't know what you need to know unless you know what you need to know"

Louis K. Wagner, Professor of Radiology and Chief Physicist,
University of Texas Medical School at Houston

Patient Exposure During Fluoroscopy

- Since 1994 FDA has issued several advisories and notices on the avoidance of skin injuries during fluoroscopically guided surgery and recommendations to keep estimates of skin exposure in a patient file
- Archer and Wagner at Baylor College of Medicine and many others have written extensively on the dangers involved and the minimization of risks
- ICRP has issued procedures for avoiding injuries during interventional radiology
- CRCPD (2001) issued a resolution regarding the prevention of unnecessary exposure to patients during fluoroscopy

Keys to Reducing Patient Exposure

- Education
- Training
- Measurement
- Analysis
- Improvement

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Responsible Radiation Management

- Monitor and document patients' peak skin dose, in particular for:
  - Heavy patients
  - Pediatric
  - Long Procedures
  - Repeat Procedures
- Strategize & refine fluoroscopy management
  - Safe planning of future procedures
  - Improves fluoroscopic technique
  - Reduces patient exposure

Dose Monitoring Methods

Measurement Method	Advantages	Disadvantages
TLD/OSL		Inadequate when beam is re-oriented, not real time
Diode/Ion chamber	Real time values	Inadequate when beam is re-oriented
DAP/KAP	Real time values	Difficult to assess and locate peak skin dose
Fluoroscopy time	Easy to measure	Poorly correlated to peak skin dose
Radiochromic film	**Directly locates and measures peak skin dose**	**Not ideal for real time**

Positioning of GAFCHROMIC® XR-R

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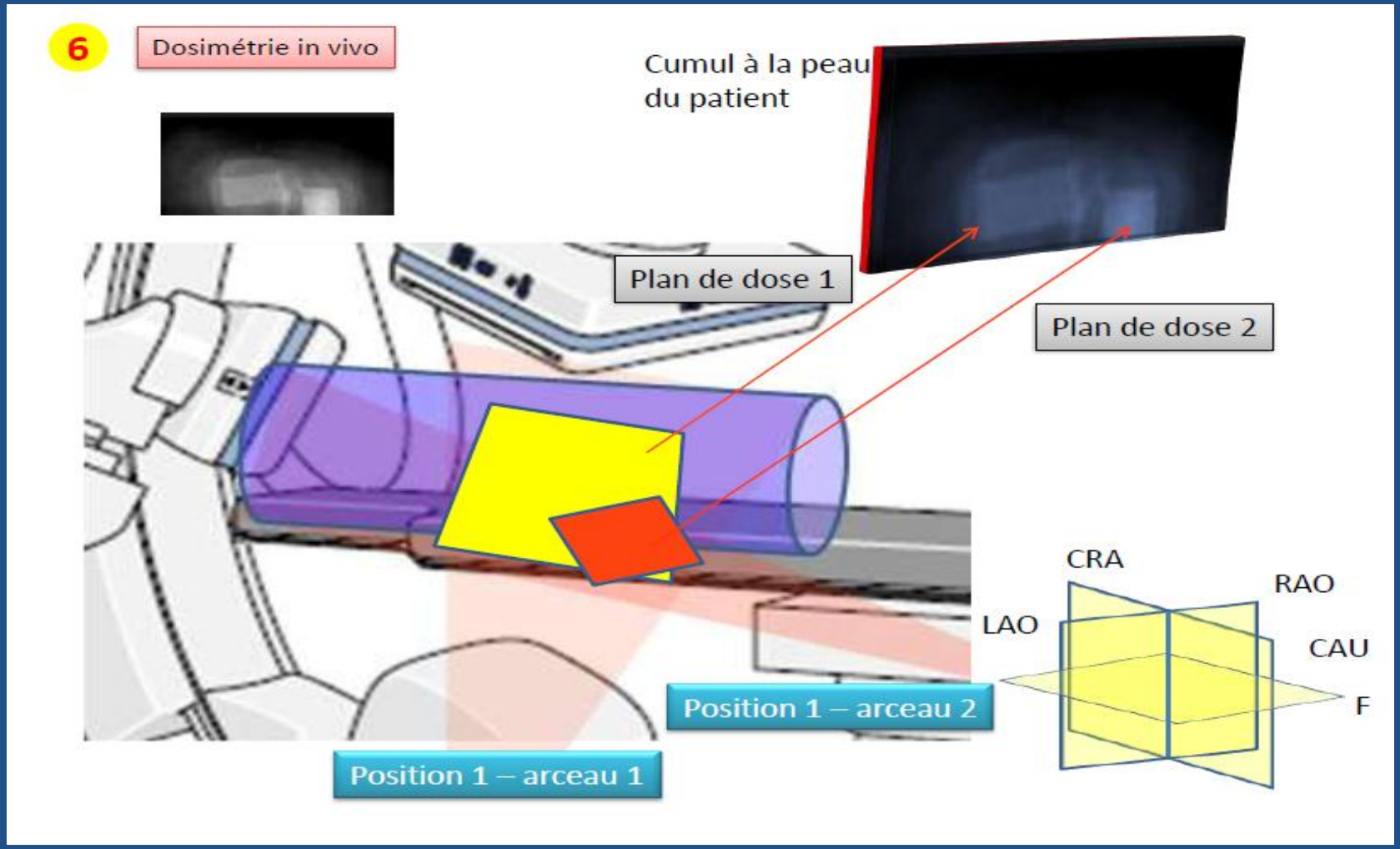
Positioning of the GAFCHROMIC® XR-R



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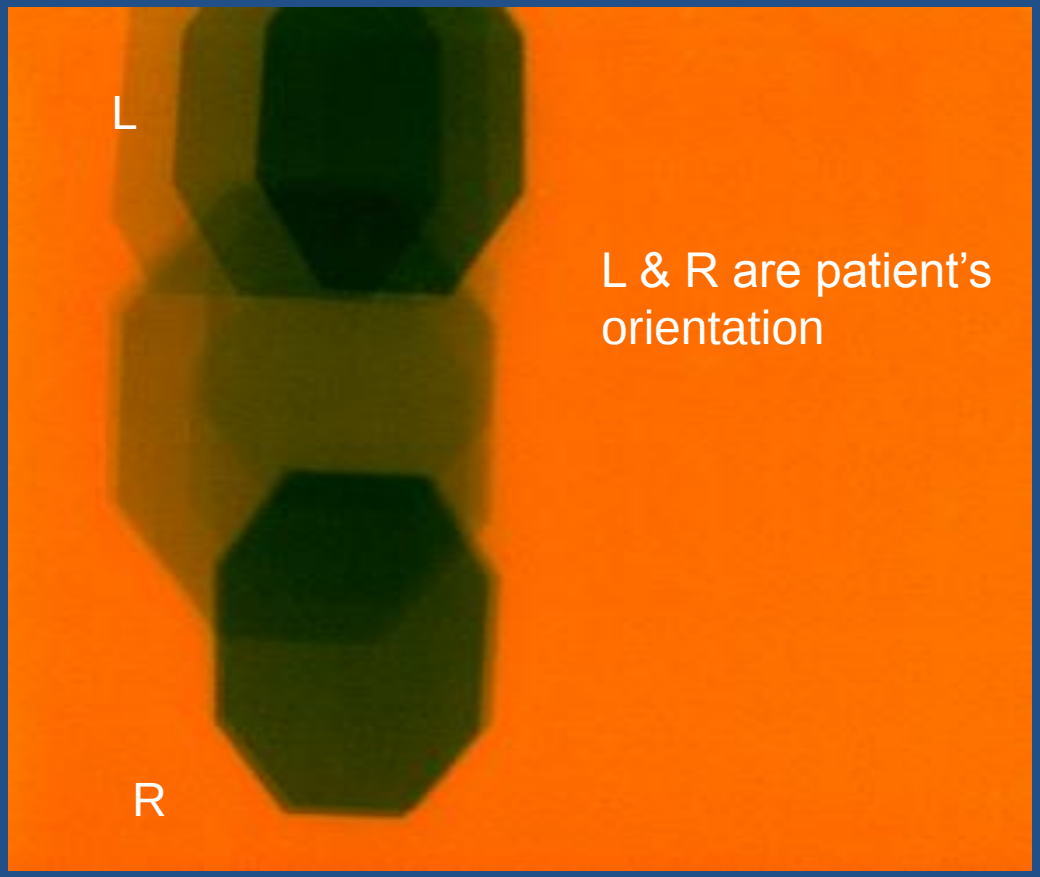
Dose Monitoring with Gafchromic® XR-R



- **Immediate visualization** of patient exposure – magnitude and location
- Detailed **dose distribution**

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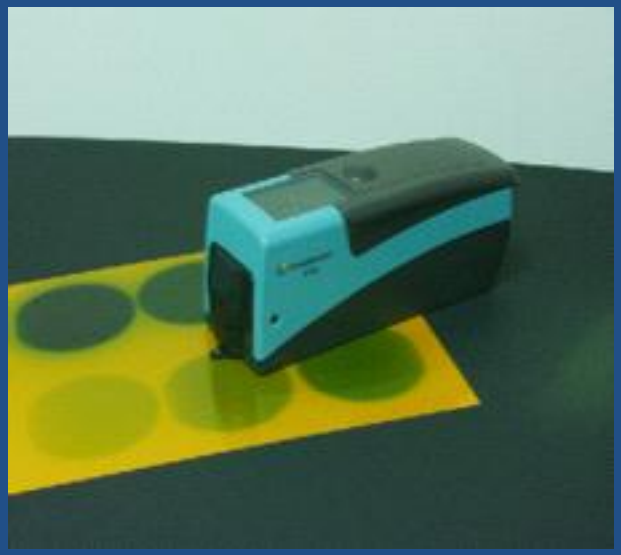
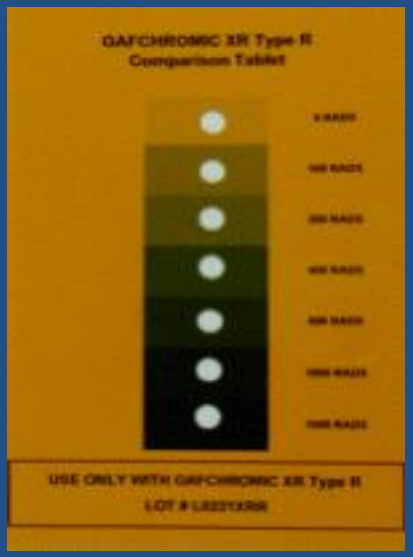
Ways to Measure Dose

- Skin dose is determined by measuring the darkening of the film using either:
  - Densitometer (preferably a reflection densitometer)
  - Comparator strip
  - Flatbed scanner
    - √ specifically designed software – FilmQA-XR



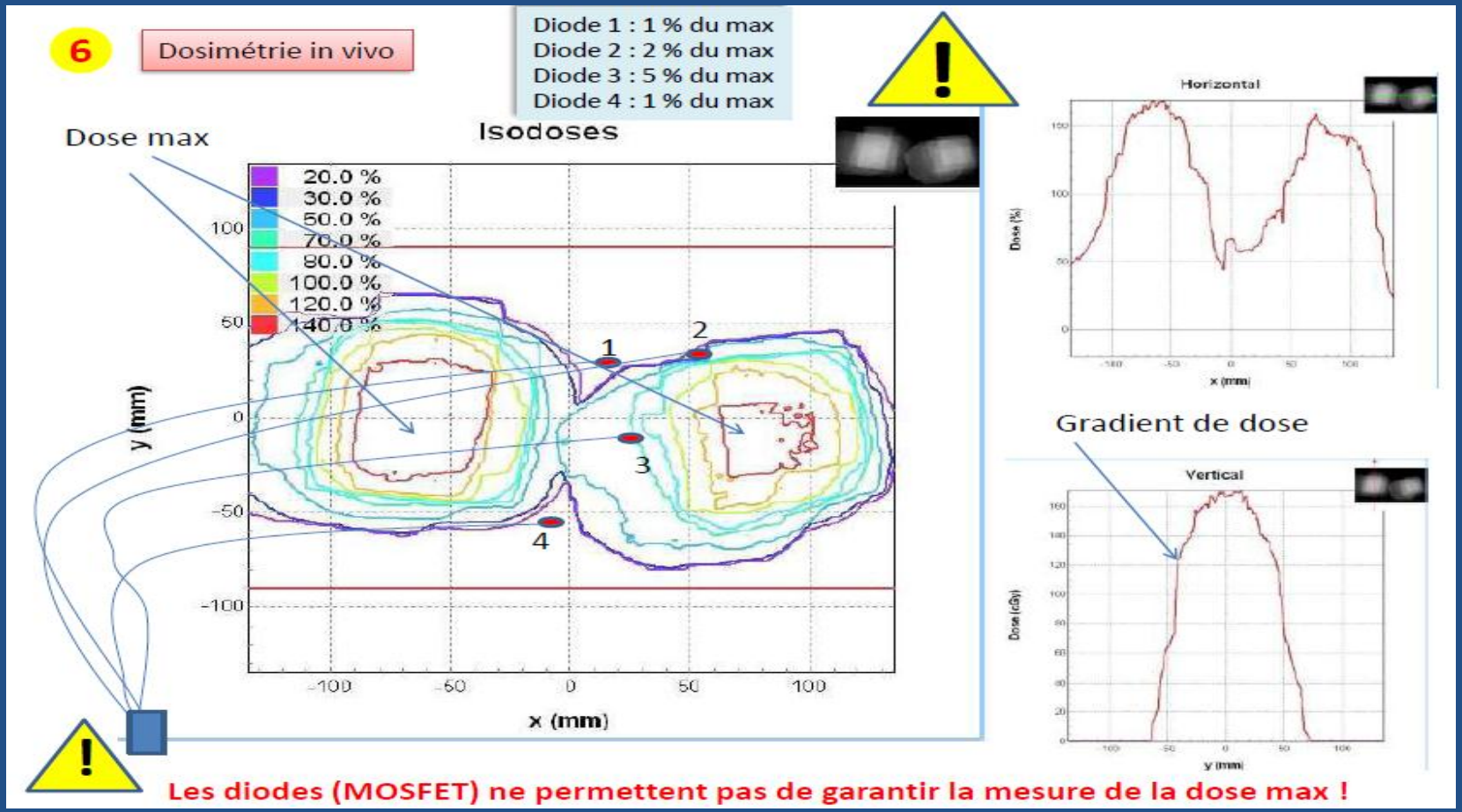


IAEA Sponsored Studies

	Coronary	Non-Coronary
# of patients	400	250
% > 2Gy	12	10
Repeat	40%	40%

- Gafchromic ® Film
  - Easiest
  - Simple
    - √ Visual Reference
    - √ Feedback during procedure
  - Consistent and Reliable Results
- DAP/KAP
  - Difficult to correlate to peak skin dose
- Importance of Dose Monitoring

Comparison of Gafchromic XR-R Measurement vs. Diodes



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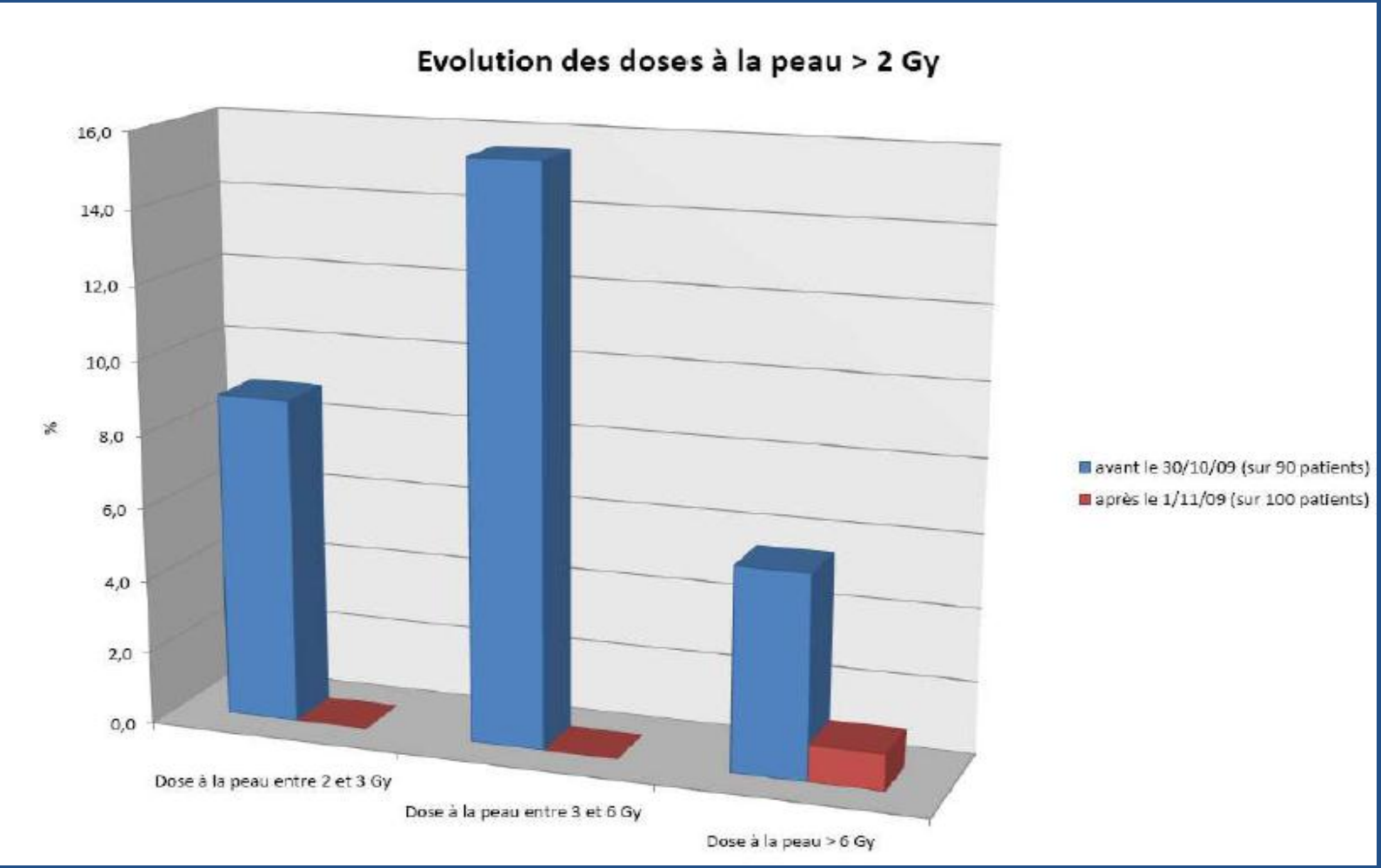
Patient Peak Skin Dose History



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FilmQA™ XR

- Specifically Designed for Optimized Use of Gafchromic XR series of Films
- Easy Use
  - Simple Work Flow
  - Film Batch Specific Calibration
  - Single Click Film Analysis
    - √ Point Dose
    - √ Dose Mapping

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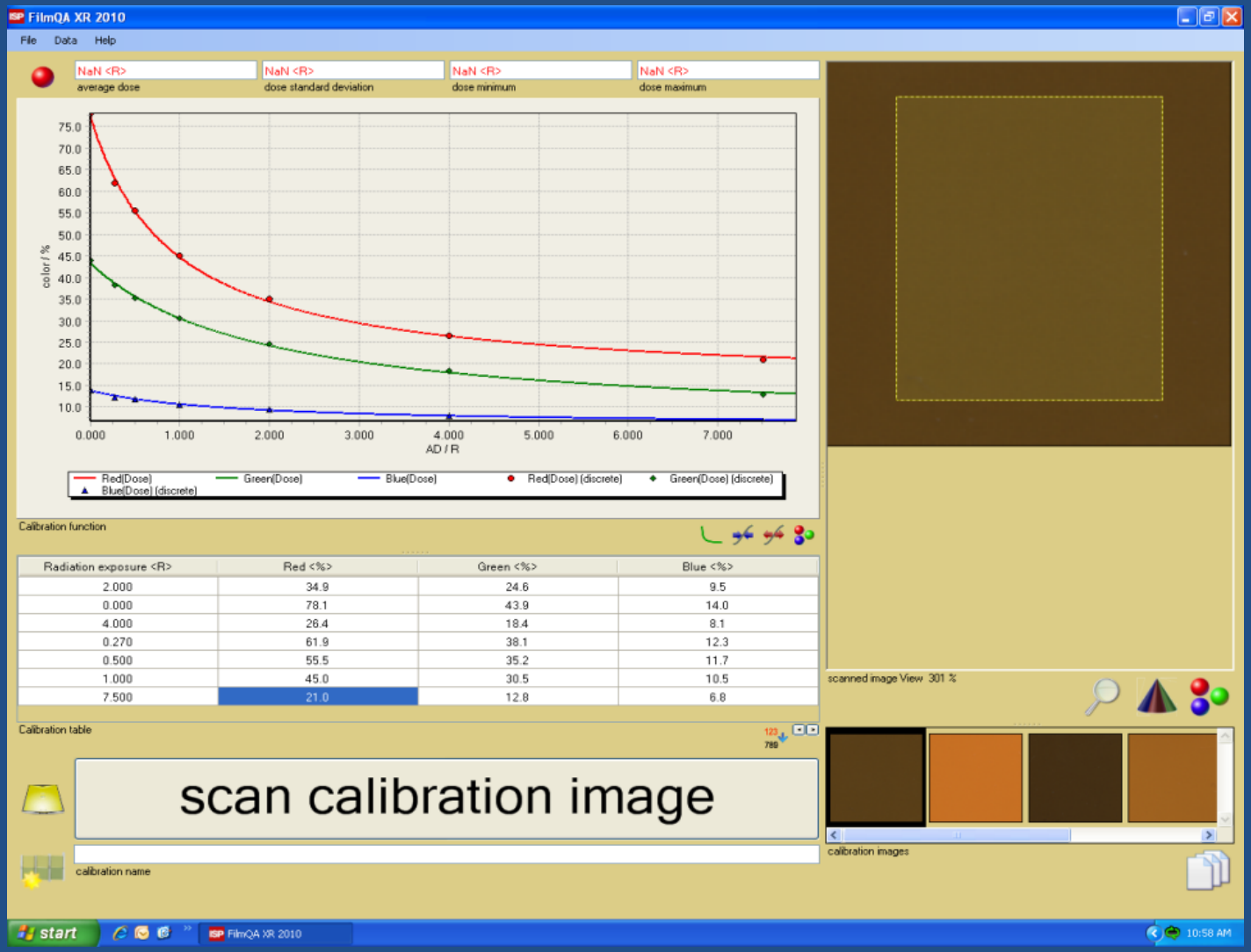
FilmQA™ XR - Calibration



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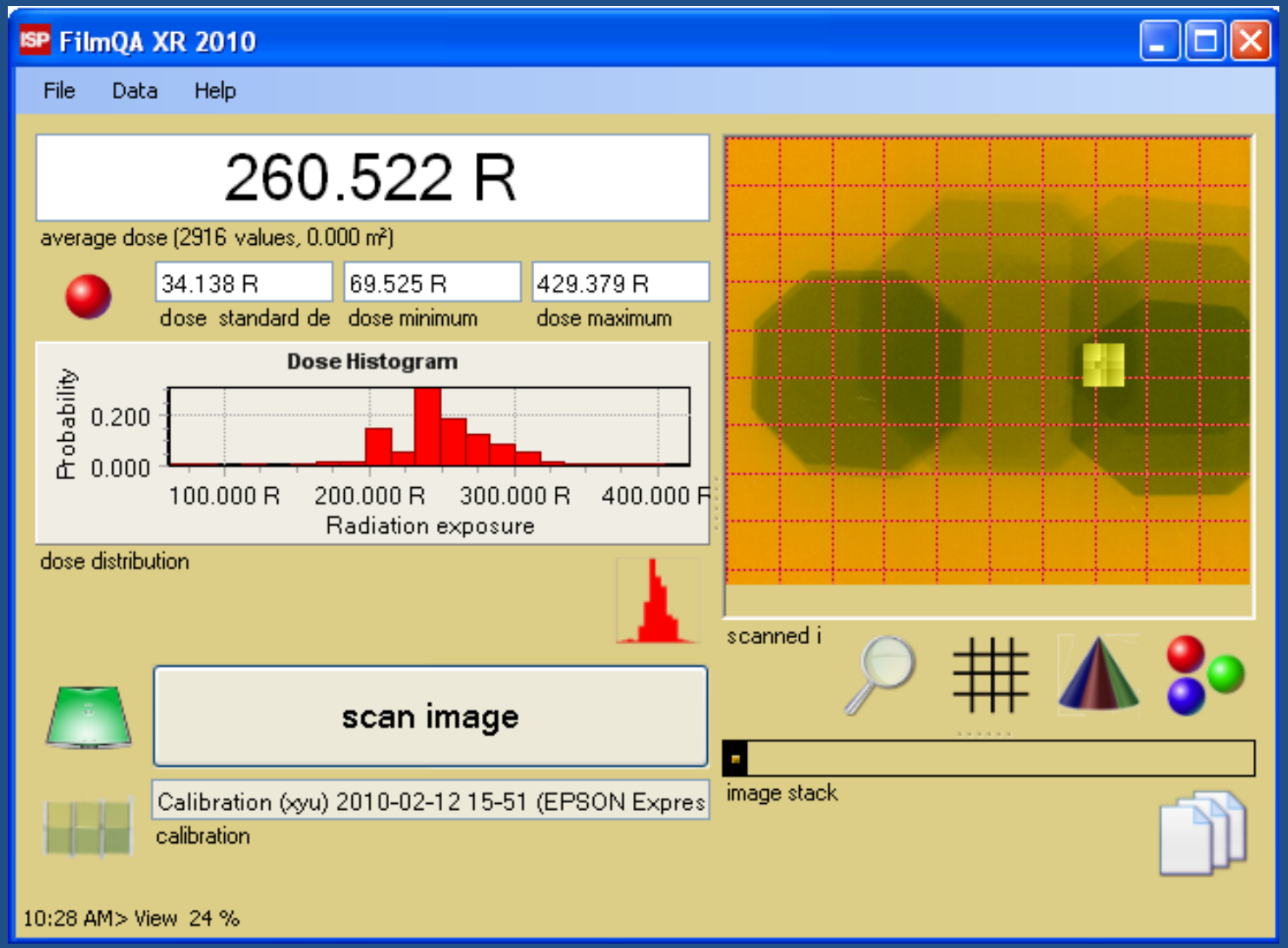
FilmQA™ XR – Point Dose



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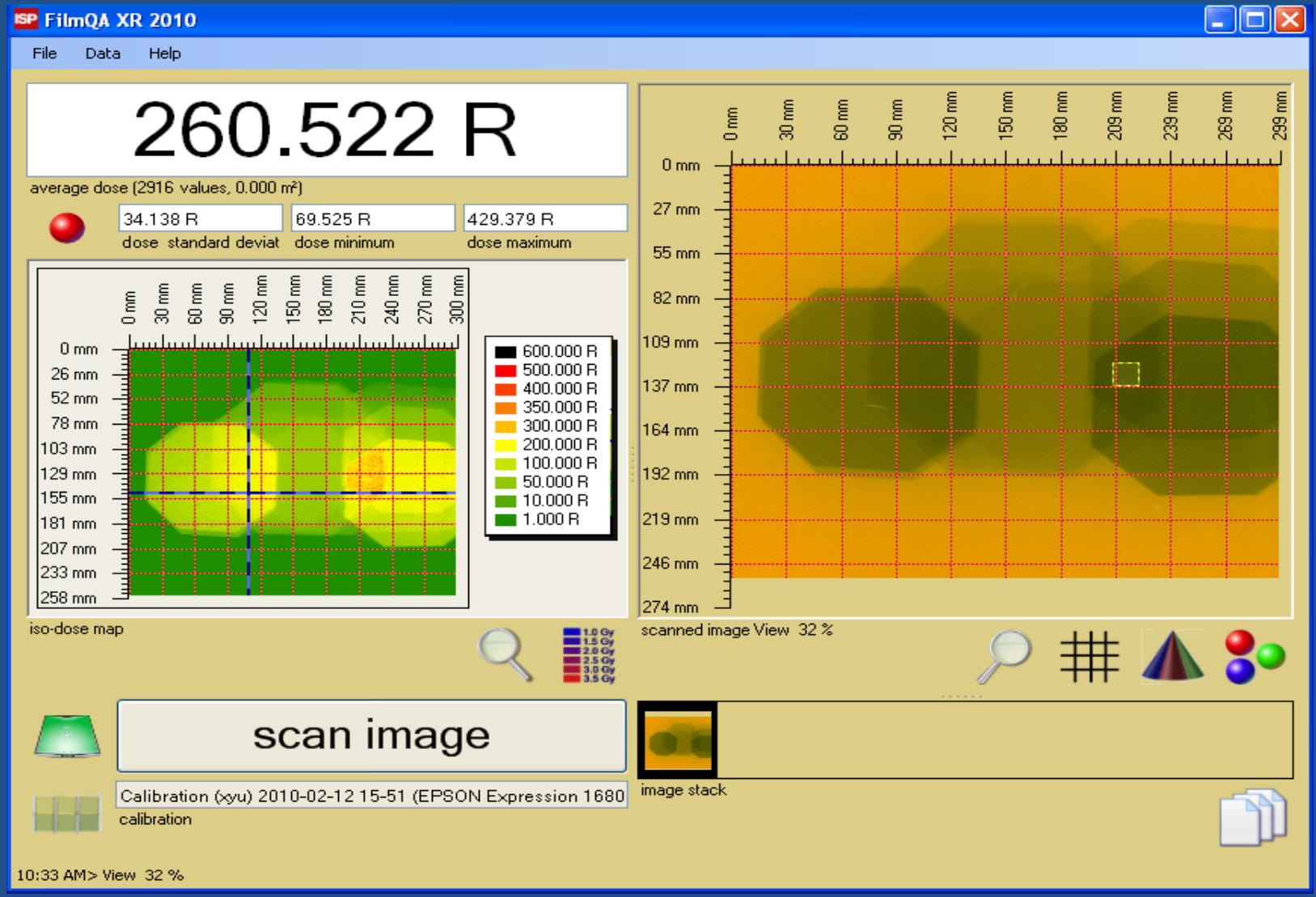
FilmQA™ XR – Dose Mapping



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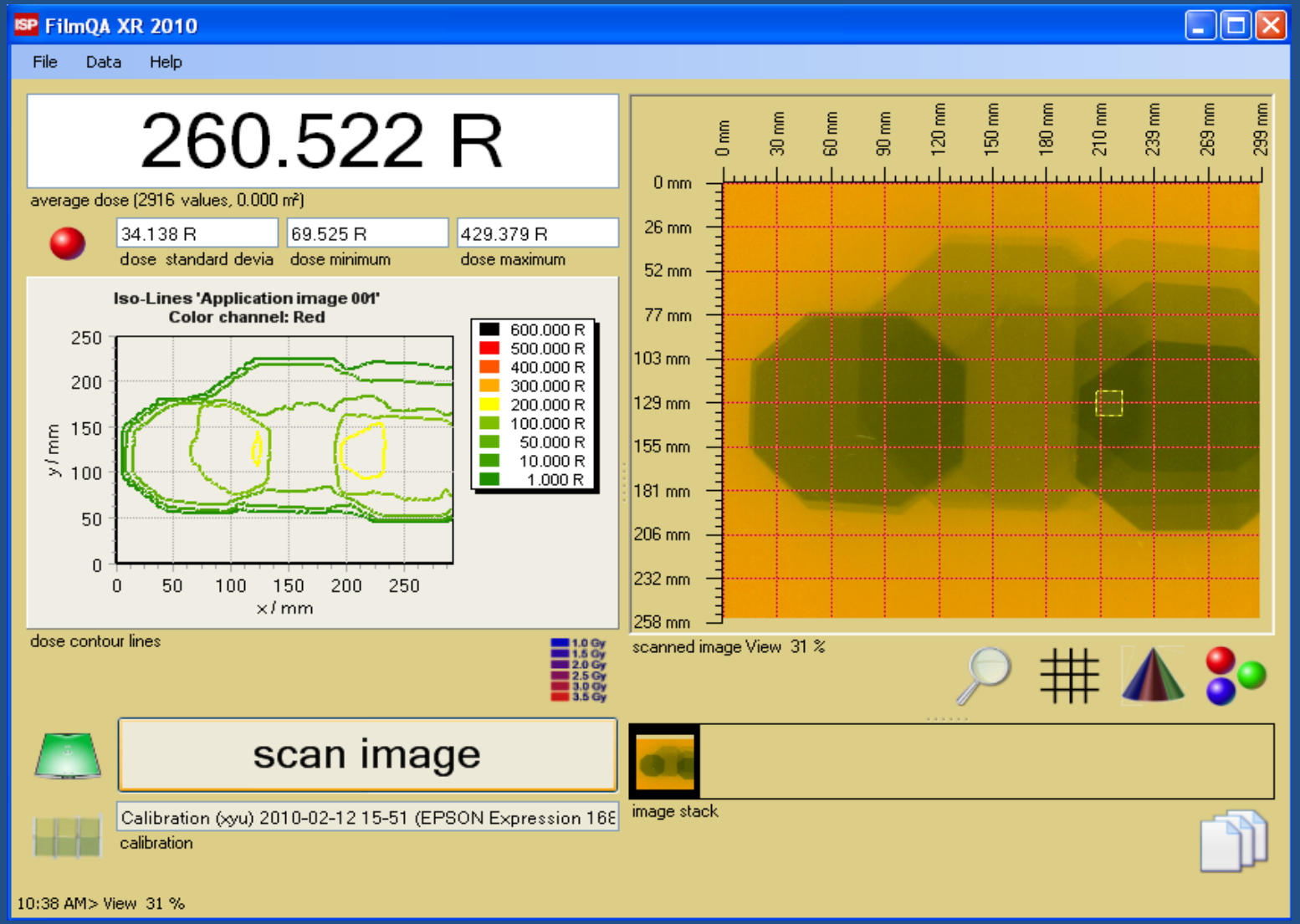

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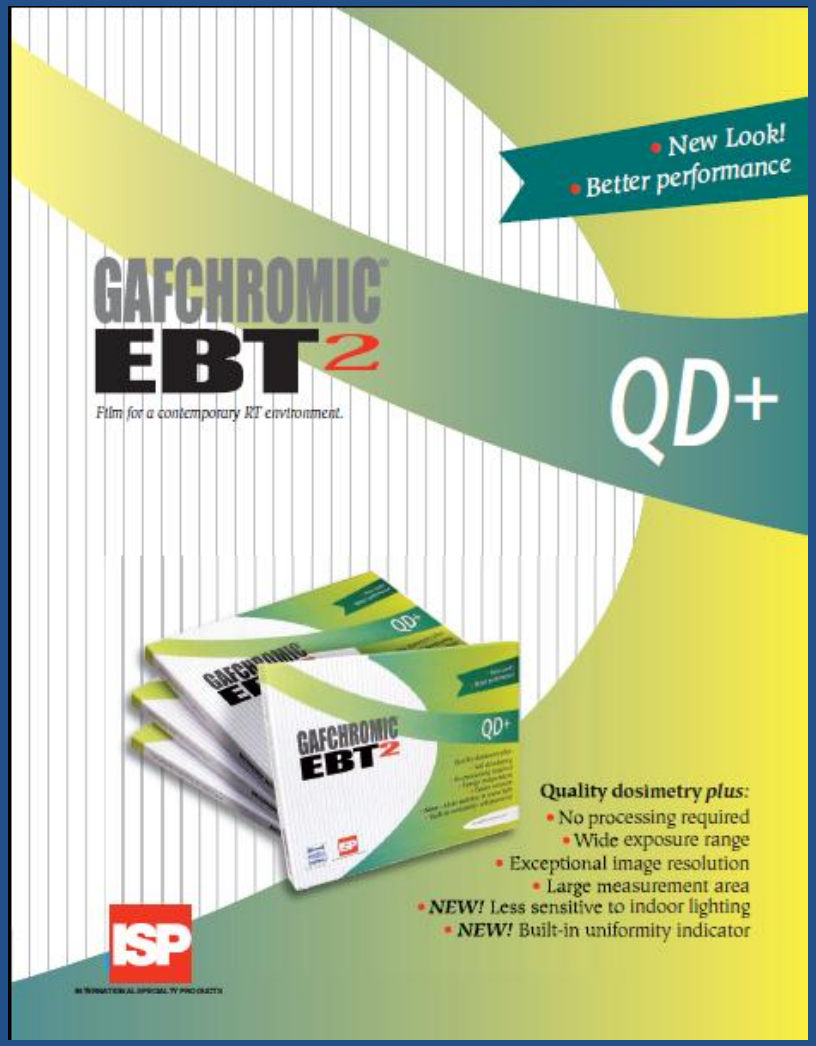
Other Product Offerings- Radiotherapy



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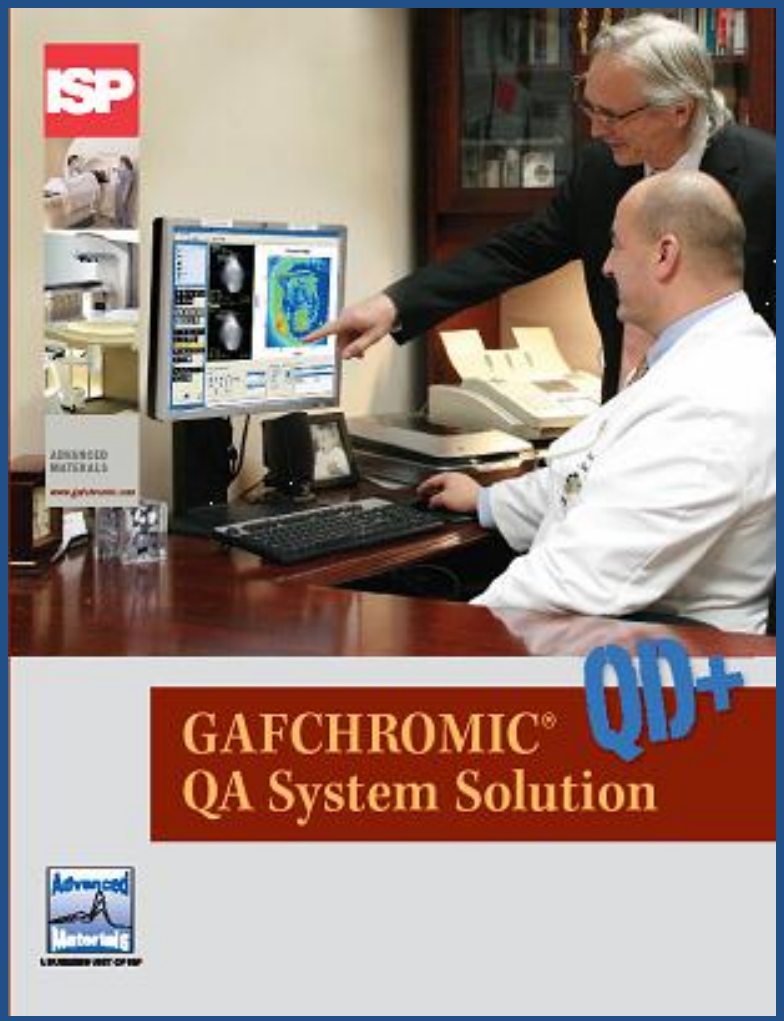
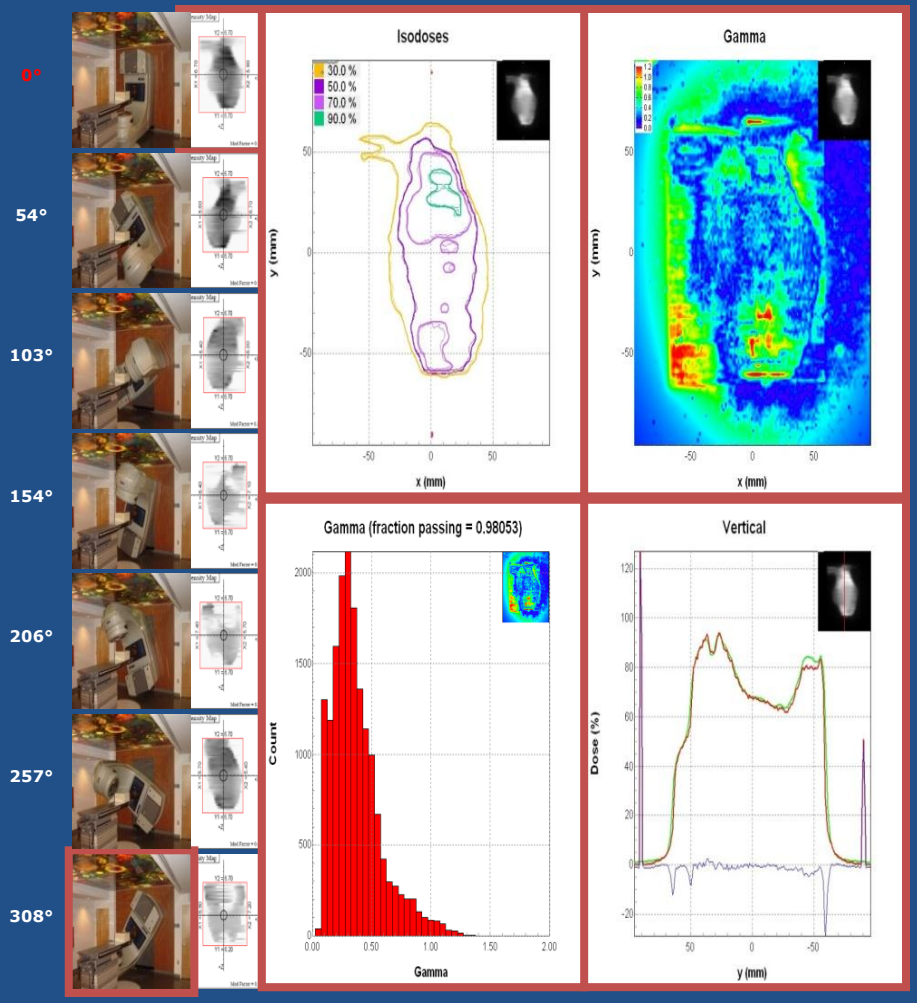
Radiotherapy – Contd.





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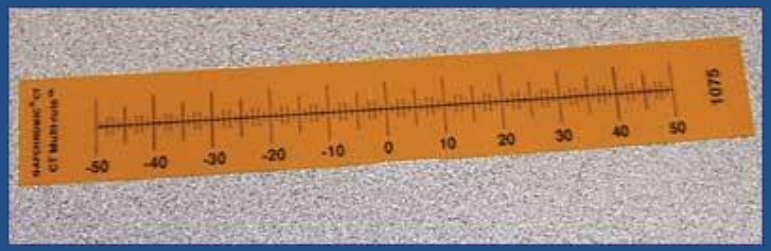
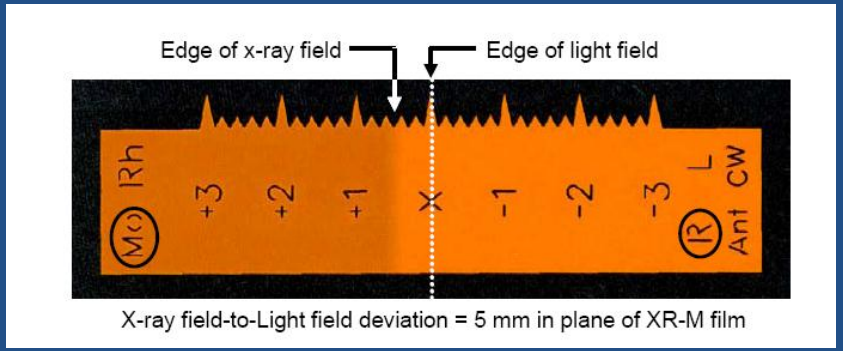
Other Product Offerings - Radiology

- XR-CT



- XR-M



X-ray field-to-Light field deviation = 5 mm in plane of XR-M film

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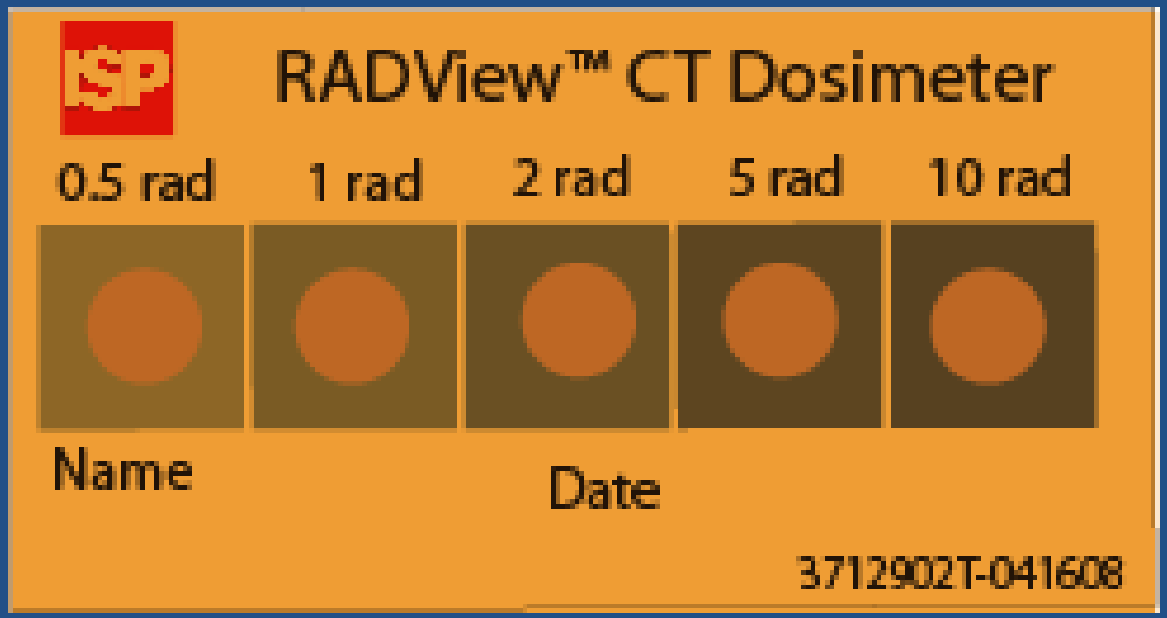
Radview CT Dosimeter

- Radiation Awareness
- CT Overuse



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For more System Information.....

Please visit

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www.FilmQAXR.com

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