COCIR

Sustainable Competence
in Advancing Healthcare

HERCA
HEADS OF THE EUROPEAN RADIOLOGICAL PROTECTION COMPETENT AUTHORITIES

HERCA Multi-Stakeholder meeting
6 March 2017 - Vienna

OPTIMIZED USE OF CT SCANNERS

CT MANUFACTURERS' COMMITMENT
- CONCLUDING ACTIVITIES -

Lee Bush
Chair of the COCIR HERCA Task Force

COMMITMENTS UPDATE

CHARACTERIZATION OF CT SYSTEMS STANDARDIZED BENCHMARKING

- The MITA CT Image Quality (IQ) Task Force designed a reference phantom for objective quantification of head and body Low Contrast Detectability (LCD).
- The methodology offers the potential to quantitatively assess LCD for clinical protocols in the body and in the head in relation to dose.
- A draft of the white paper was reviewed with the HERCA PoA during RSNA in Chicago in November 2016.
- The publication of the White paper is expected in March 2017 (successful ballot by X-Ray section. Final draft sent to MITA standards approval/publishing committee and distributed to HERCA prior to the meeting).

Computed Tomography Image Quality (CTIQ): Low Contrast Detectability (LCD) Assessment when Using Dose Reduction Technology

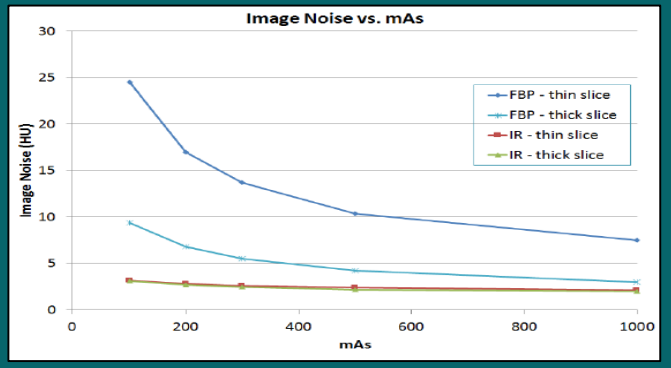
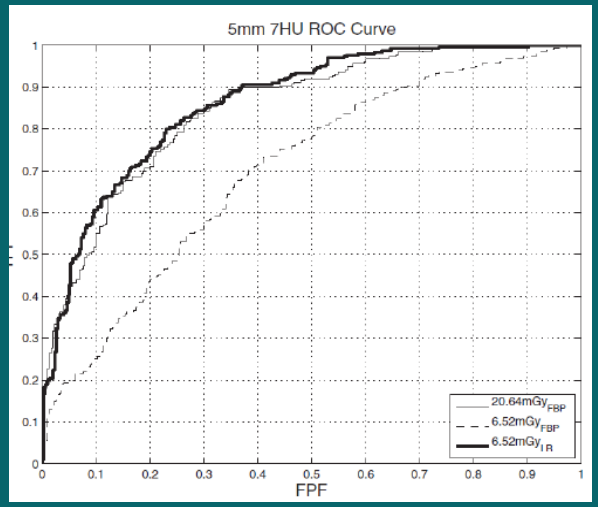


Image noise vs. Mas



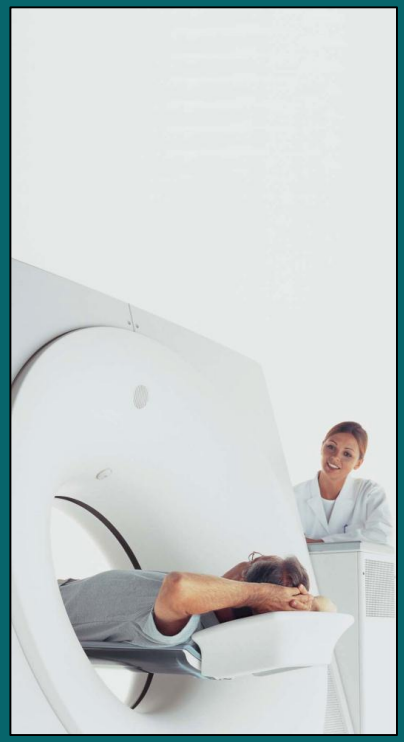
ROC curve examples: 5 mm 7 hu object with body ring

COMMITMENTS UPDATE

- SSDE
  - IEC 62985 Ed. 1.0 "Methods for calculating Size Specific Dose Estimate (SSDE) on Computed Tomography" project team (PT62985) formed; first meeting March of 2015.
  - Publication expected in August 2018.
  - A focused meeting was held in February 2016 to resolve remaining technical questions and complete committee draft for review at the March 2016 MT-30 meeting.
  - **CD of IEC 62985 Ed. 1.0 released January 16th, 2017: Plan to review comments at March 2017 meeting and issue a CDV after September 2017 meeting.**

- REVISED ACCEPTANCE AND CONSTANCY STANDARD
  - IEC 61223-3-5 ed.2.0 will combine methods for acceptance and constancy as well as an automatic exposure control (attenuation based mA modulation) functional test method.
  - **CD of "IEC 61223-3-5 ED2: Evaluation and routine testing in medical imaging departments - Part 3-5: Acceptance tests - Imaging performance of computed tomography X-ray equipment" released January 16th, 2017**
  - **Closing Dates for comments 03-10-2017. Goal is to issue a CDV after September 2017 meeting.**

- MONITORING PROGRESS OF SCIENTIFIC ENDEAVOURS
  - AAPM TG 246: standardized estimation of organ doses

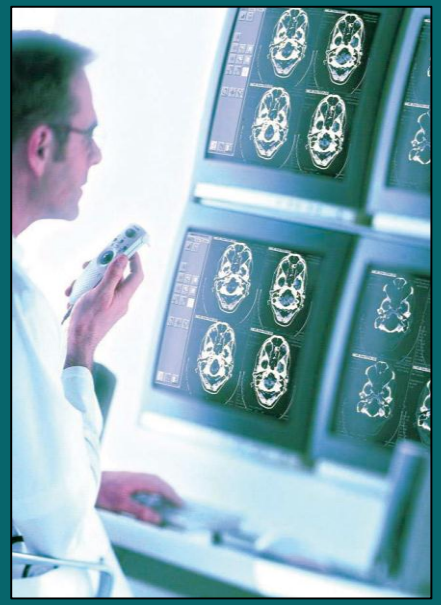


IEC 62985 Ed. 1.0 *"Methods for calculating Size Specific Dose Estimate (SSDE) on Computed Tomography"*

IEC 61223-3-5 Ed2 *"Evaluation and routine testing in medical imaging departments - Part 3-5: Acceptance tests - Imaging performance of computed tomography X-ray equipment"*

TRAINING

- Given current technology – Utilization of the state of the art dose reduction features will likely have largest impact. Training of users is a key enabler.
- **Manufacturer's training** is designed to support customer facilities in an effort to improve operating knowledge and increase the skill level of personnel. These programs consist of a variety of delivery mechanisms.
- Manufacturers are also involved in several initiatives such as:
  - EuroSafe (EU)
  - ImageGently (US)
  - ImageWisely (US)
  - AAPM Working Group: Alliance for quality CT



MANUFACTURERE'S TRAINING

- Hands-on and didactic training to reinforce skills needed to operate equipment
- Operator Manuals to demonstrate information on dose optimization tools and dose reduction strategies
- Information on dose related displays, indices, and where dose information is located
- Onsite training, classroom instruction, remote instructor-led training and observation, online tutorial self-help, telephone support, publications, seminars, peer to peer physician training, and industry association educational material.

TRAINING COMMITMENT

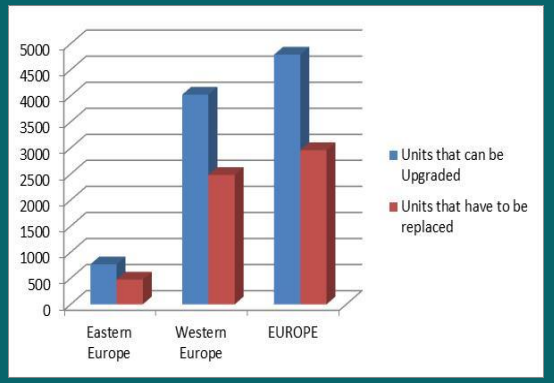
The April 2016 MSM Meeting focused on gaps related to training of users on CT dose reduction features. HERCA invited COCIR to start a cooperation with EFOMP and EFRS.

- **On 3 March 2017 COCIR and EFOMP signed a Memorandum of Understanding** focusing on the following elements:
  - Foster training of medical physicists on the best use of new equipment and technology in **imaging and therapy** to reduce radiation exposure of patients and users
  - Promote the use and adoption of the best technologies in radiation protection and dose reduction
  - Increase awareness of public authorities regarding the aging of the installed base of medical equipment and availability of dose reduction technology.
  - Develop common understanding of international and European Basic Safety Standards (BSS) requirements referring to medical application
  - Mutually promote each other's educational and scientific activities as far as allowed by the societies' rules
- **The cooperation will concretize in a joint COCIR-EFOMP edition of the EFOMP ESMPE School in January 2018 in Prague and in a joint-session at EFOMP bi-annual congress in August 2018.**
- Initial contacts have started between COCIR and EFRS to explore possible options of cooperation.

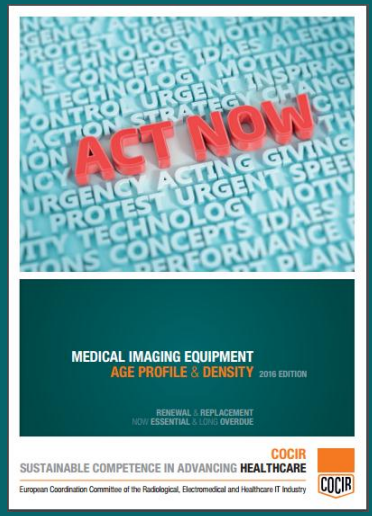
3 March 2017 Memorandum of Understanding signed by COCIR and EFOMP

OBSOLESCENCE OF EQUIPMENT

- The uptake of new technologies is slow (COCIR 2016 report on density and ageing profile).
  - One quarter of the Computed Tomography installed base falls below accepted standards for radiation dose optimization.
  - More than 3000 scanners in Europe are not suitable for upgrade (dose modulation and iterative reconstruction engines)
- The European Society of Radiology (ESR) has recognised the clinical importance of planning for timely replacement of equipment. In 2014, ESR published a position paper stating that; *"Equipment less than five years old is state-of-the-art technology. Properly maintained equipment between six and ten years old is suitable for practice, but radiology departments should develop a strategy to replace them. Machines over ten years old must be replaced."*



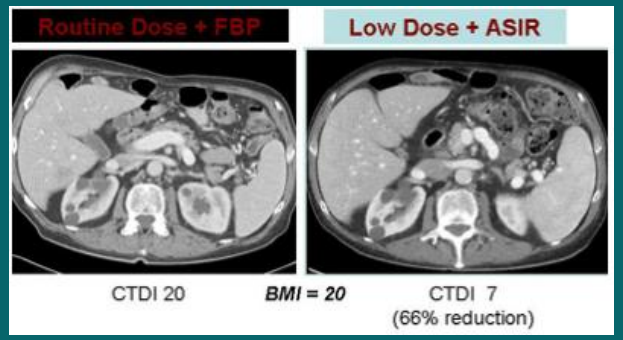
2/3 of European CT installed base do not comply with those triggers. 25% cannot be upgraded



COCIR 2016 report on density and ageing profile

DISCUSSION AND CLOSING

- Significant progress in characterization of CT performance (CTIQ LCD WP) and improved patient centric dose indication (SSDE CD)
- Continued commitment to training through manufacturer sponsored training, industry training initiatives, and collaboration with professional societies.
- Concern with aging equipment and user access to innovative dose reduction technology.



Iterative image reconstruction: dose reduction