Summary of Topical Sessions and Roundtables

Dr. William Hendee

Debbie Gilley

Program Committee Chairman

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DRIVERS OF A PATIENT-CENTERED SAFETY CULTURE

- Leadership
- Evidence-based practice
- Teamwork
- Accountability
- Communication
- Continuous Learning
- Justice

Applies to radiation protection with a safety culture. (LeGuen)

“In some developing countries, medical physicists are not formally recognized, and regulators and health authorities do not consider radiation protection as part of their jurisdiction.”

A. Nader

Increased Medical Exposure Past 25 yrs US data

ASSUMPTIONS

- Most imaging procedures are done for appropriate reasons
- Appropriate procedures yield benefit/risk >> 1

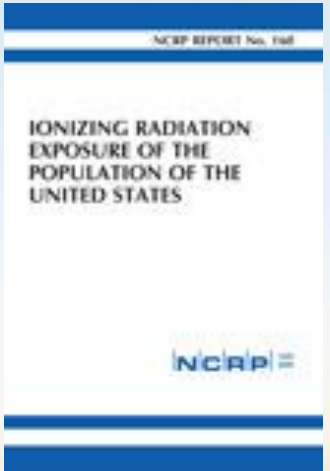
NCRP FINDINGS (USA) OVER PAST 25 YEARS

- Individual dose per exam decreases (for CT)
- Average individual dose from medical procedures increased 5.5x
- Population dose from medical procedures increased 7x

CONCLUSIONS: very good news because many more patients benefitting from medical imaging

- Better technology
- More applications
- Greater access

All procedures must be justified, optimized, implemented correctly and evaluated



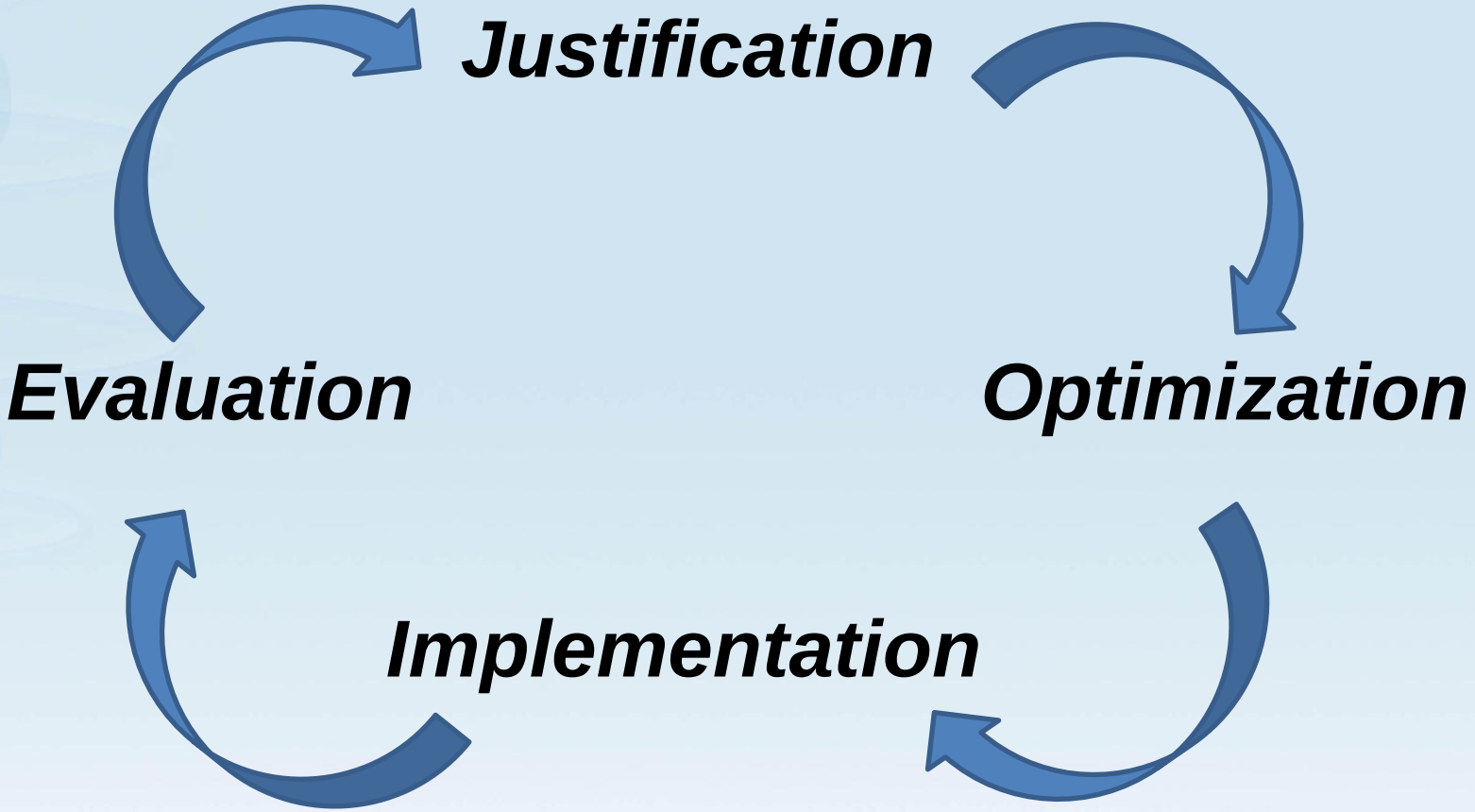
UNSCEAR

Therefore the Scientific Committee (of UNSCEAR) does not recommend multiplying very low doses by large numbers of individuals to estimate numbers of radiation induced health effects within a population exposed to incremental doses and levels equivalent to or lower that natural background levels.

Tracking of imaging procedures

- Various cards and forms developed by voluntary and government agencies
- Provide sense of self-determination to patients
- Useful for data compilations
- Benefit/risk decision for any medical exam is unaffected by numbers previous exposures
- Collective impact of individual doses uncertain

Continuous Quality Improvement



JUSTIFICATION: OVERUTILIZATION/UNDERUTILIZATION IMAGING

- Decision Support
- Developed countries: Integrated into CPOE and EMR
- Developing countries: Written guidelines and personal communication

RADIATION THERAPY CHALLENGES

- Complexity
- Software domination
- Non standard beams/fields
- In Vivo dosimetry
- Radiobiology (radio sensitivity, second tumors and children)
- Tissue activation
- Evidence of effectiveness (absolute/relative)
- Challenges countries with few resources

“In commissioning and calibrating treatment units, a single physicist is not enough – there must be cross checks between physicists.”

T. Knoos

As the complexity of Dx and Rx devices increases, quality assurance measures must be simplified and automated to ensure that hardware, software and operator components are functioning properly.

extracted from comments by T. Knoos

NEEDS FOR FUTURE BRACHYTHERAPY APPLICATIONS SEALED and UNSEALED SOURCES

- Studies of current patterns of use/need
- Studies of future patterns of use/need
- Patient access and adherence
- New and improved facilities
- Innovation: equipment, procedures, applications
- Equipment: improvements and access
- Staff: more in right places in world
- Training: SOPs that are simple and straightforward
- Improved dosimetry
- Radioactivity release criteria
- Safety/Security: emphasis on BSS
- Disparities: improving access globally

SAFRON

Safety in Radiation Oncology

- Event reporting system for radiation therapy will become available next week.
- This will have a major role in providing information for event reduction.

O. Holmberg

and

J. Le Heron

DEVELOPMENTS IN FLUOROSCOPY-GUIDED INTERVENTIONAL PROCEDURES

- 2D3D registration CTCBCT and DSA
- Robotic systems
- Magnetic steering of catheters
- Dynamic flat-panel detectors
- Dose-tracking systems
- Electronic dosimeters

R. Loose

DIAGNOSTIC REFERENCE LEVELS FOR INTERVENTIONAL PROCEDURES

- Standardization and consensus for DRLs in IR
- Trigger levels at 2-3 (?) DRLs
- Dose quantity for DRLs
- Frequency of updating DRLs
- DRLs for all imaging procedures

E. Vano

Image Wisely, which has focused primarily on CT till now, is turning it's attention to dose reduction in nuclear medicine

ASNC Recommendations:

- Stress testing only
- Weight based dosing
- Follow guidelines

CONFUSION OF “LOW DOSE” CT

- Temporal variation
- Geographic variation
- Variation between patients
- Conceptual misinterpretation
- **Radiology** requirement
- **Medical Physics** requirement

CHALLENGES OF DIGITAL RADIOGRAPHY

- Recalibrate AEC for upgraded systems
- Understand new digital terminology
- Use collimation rather than post-exposure image cropping
- Decrease rather than increase dose with digital systems when possible
- Adjust DRL levels if necessary
- Find appropriate image quality as the primary aim – then reduce dose
- Make raw data accessible for QA/data management

DOSE REDUCTION DEVELOPMENTS IN CT

- For many CT procedures, effective doses < 1mSv are achievable
- Optimized spectra (kVp) adult and child
- Efficient detectors
- Beam collimation
- Dose management (TCM, AEC)
- Dedicated CT scanners
- Image reconstruction – iterative
- Surrogate dose measurements

GLOBAL COLLABORATION IN CT

- AAPM WGCTNP
  - CT Dose Summits
  - Terminology Lexicon
  - Recommended Protocols

- Users, manufacturers, regulators, MITA *
- Open access to all information
- Primary focus to date on North America
- Possible international collaboration (COCIR?)

PATIENTS and PROVIDERS

- Truthfulness and Directness
- Partnership and collaboration
- Openness and transparency
- Identify and understand options
- Engagement and involvement

“Patients don’t care what you know until they know that you care”
Margaret Murphy

SUMMARY

- Image patients wisely and gently
  - An imaging study should use as little radiation as possible, while still meeting the image quality needs of the exam
  - Concerns for special groups(children, pregnant women, person with family history, hypersensitive individuals)
  - An imaging study that is non-diagnostic because the radiation dose is too low may require rescanning the patient – increasing the total patient dose
  - In every appropriate imaging study, the benefits outweigh the risks

imagegently.org
imagewisely.org

Setting the Scene for the Next Decade

INSTILLING A CULTURE OF SAFETY

- Requires leadership from the top
- But it is everyone's responsibility