The Alphabet Soup of Regulatory Compliance: Being Prepared for Inspections

Linda Kroger, MS
UC Davis Health System

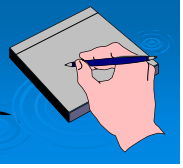
Objectives

- Recognize the various regulatory bodies and organizations with oversight or impact in Nuclear Medicine, Radiation Oncology and Radiology.
- Examine 10CFR35 requirements.
- Discuss available guidance documents
- Look at TJC and CMS requirements

Inspections are often unannounced, so

BE PREPARED

DOCUMENTATION



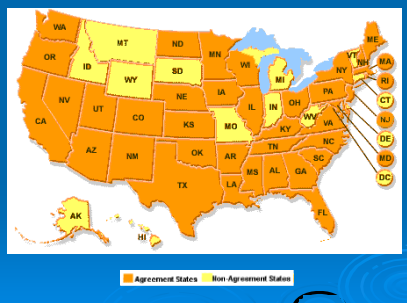
Who has Oversight or Impact?

- Regulatory Bodies
  - NRC or State (RHB)
- Institutional Committees
  - RCS
- Professional Organizations
  - SNMMI, ACR, ASTRO, HPS, AAPM
- Guidance Organizations
  - NCRP, ICRP, ICRU

Regulatory Bodies

- NRC

Agreement Status



Currently, there are 37 Agreement States.

Regulatory Bodies

- NRC
- State Radiologic Health Branch
- FDA
- DOT/IATA
- CMS
- TJC (JCAHO)

Institutional Oversight

- Radiation Safety Committee (RSC)
- Quality of Care (CQI)
- Institutional Review Board (IRB)
- Radioactive Drug Research Committee (RDRC)
- Pharmacy (Nuc Med)

Professional Organizations

- ARRT
- NMTCB
- SNMMI
- ACR
- ASTRO
- AAPM
- Health Physics Society (HPS)

Alphabet Soup

- NRC
- RHB
- FDA
- DOT
- IATA
- TJC
- CMS
- IRB
- RSC
- RDRC
- SNMMI
- ASTRO
- ARRT
- NMTCB
- ACR
- AAPM
- HPS
- NCRP
- ICRP
- IAEA

Regulatory Agencies

- NRC
  - 10CFR35
    - NRC States follow it directly
    - Agreement States adopt Part 35
      - Some adopt it in its entirety
      - Others recognizes selected sections
    - Read Part 35 and your state regulations carefully
  - 10CFR19, 10CFR20

U.S.NRC *Protecting People and the Environment*
UNITED STATES NUCLEAR REGULATORY COMMISSION

NRC Guidance

Revision 2

10CFR35

- Covers the medical uses of radioactive materials
- Defines authorization
- Written Directive
- Medical Events
- Recordkeeping

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

10CFR35

- 35.2
  - Authorized User – A physician, dentist or podiatrist who meets the requirements in 35.59 and 35.190, 35.290, 35.390, 35.392, 35.394, 35.490, 35.590 or 36.690 or is identified as an AU on a recognized license.

10CFR35

- 35.190, 290, 390, 392, 394, 396, 490, 690
  - Defines the training requirements for physicians to be an AU on a license
    - Board certified and Attestation or
    - Physician who meets the training requirements and Attestation or
    - Already identified as an AU on a state or NRC license

NRC 313A Form

10CFR35

- 35.1000
  - Microspheres (SIRSpheres, Theraspheres)
  - Gliasite
  - GSR - Perfexion

10CFR35

- 35.10
  - License always supersedes the regulations

10CFR35

- 35.40
  - Written Directives
    - Required for all therapies
    - AU signature and date (Electronic signatures are allowed - have a formal procedure)
    - Nuclear Medicine
      - Any dose of ^{131}I (NaI) > 30 µCi
      - Drug, dosage & route (for all but ^{131}I)

10CFR35

- 35.40
  - Written Directives
    - Radiation Oncology therapies
      - For GSR (GK)
        - Total dose, treatment site, coordinate (and sector) settings for each site
      - For Teletherapy
        - Total dose, dose/fraction, # fractions, treatment site

10CFR35

- 35.40
  - Written Directives
    - Radiation Oncology therapies
      - For HDR
        - The radionuclide, treatment site, dose/fraction, # fractions, and total dose

10CFR35

- 35.40
  - Written Directives
    - For All Other Brachytherapy (e.g. seeds)
      - Before implantation - Treatment site, radionuclide and dose
      - After implantation – Radionuclide, treatment site, # of sources, total source strength and exposure time OR the total dose.

NOTE: There will be new regulations by the end of 2015 for WD and seeds.

10CFR35

- 35.40 & 35.41
  - Written Directives
    - Most common violations:
      - Failure to follow written procedures
      - Failure to have a signed and dated WD prior to administration

10CFR35

- 35.75
  - Defines the ability to release patients
    - < 5 mSv to the public
    - NUREG 1556, vol 9, Appendix U
    - Information Notice from NRC
      - Licensees to provide consequences if directions are not followed
      - Precautions around children, pregnant women or staying at hotels

10CFR35

- 35.92
  - Decay in Storage
    - Despite the language in 35.92,
      - Some states mandate that licensees must hold waste for a minimum of 10 half lives
      - Stipulate 90 days as the maximum half life of radionuclides to be held for decay.

Correct Administration

- Record of the prescribed dose
- Record of what dose was administered
  - Radiopharmaceutical
  - Quantity (mCi)
  - Patient ID
  - Date and time of dose determination
  - Name of the person who determined the dose
  - Check to assure the dose matches the prescription.

Medical Events (10CFR35.3045)

- Dose or Dosage the differs from what was prescribed by more than 0.05 Sv EDE or 0.5 Sv to an organ, tissue or SDE to the skin and
  - The total dose differs that prescribed by 20% or more or
  - Is outside the prescribed dosage range by 20% or more or
  - The fractionated dose delivered for a single fraction differs from the dose prescribed by 50% or more

Medical Events (10CFR35.3045)

- Dose exceeds 0.05 Sv EDE or 0.5 Sv to an organ, tissue or SDE to the skin from:
  - Wrong patient.
  - Wrong radiopharmaceutical.
  - Wrong route.
  - Wrong mode.
  - A leaking sealed source
- Dose to skin or an organ other than the treatment site that exceeds 0.5 Sv or is 50% more than expected in the WD
- Reports must be made within 24 hours.

Regulatory Agencies

- NRC
  - 10CFR19
    - Notices, Instructions and Reports
      - Notice to Employees
      - Annual dosimetry reporting

Regulatory Agencies

- NRC
  - 10CFR20
    - Standards for Protection
      - Occupational and Public Dose Limits
      - Surveys and monitoring
      - Storage and Posting requirements
      - Waste disposal

Regulatory Agencies

- California - RHB
  - Title 17
    - Public Health
      - Subchapter 4 – Radiation
        - §30195 – Part 35
  - Title 22
    - Social Security
      - Division 5 – Licensing of facilities
        - §70507 – Nuc Med Requirements

Regulatory Agencies

- FDA
  - Drug approval
  - Equipment approval
  - Recall
  - RDRC
  - IND/NDA/ANDA
  - Manufacturing of radiopharmaceuticals

Regulatory Agencies

- DOT / IATA
  - Receiving
  - Shipping
  - DOT (ground) – 49CFR
  - IATA (air)
    - Staff must be certified to ship spent Rb generators
    - Return of Ir-192 HDR sources

Federal Aviation Administration

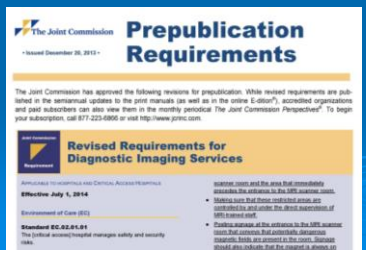
The Joint Commission

The Joint Commission (TJC)

- Formerly known as JCAHO.
- They are not a regulatory body.
- Accreditation of hospitals/healthcare facilities
- Publish standards / guidelines
- TJC strives for compatibility with CMS
- They are aware of NRC/State oversight.

The Joint Commission

- On December 20, 2013 TJC published "Revised Requirements for Diagnostic Imaging Services" effective July 1, 2014.



Prepublication Requirements

• Issued December 20, 2013 •

The Joint Commission has approved the following revisions for prepublication. While revised requirements are published in the semiannual updates to the print manuals (as well as in the online E-dition®), accredited organizations and paid subscribers can also view them in the monthly periodical *The Joint Commission Perspectives®*. To begin your subscription, call 877-223-6866 or visit http://www.jcrinc.com.

Revised Requirements for Diagnostic Imaging Services

Applicable to hospitals and critical access hospitals

Effective July 1, 2014

Environment of Care (EC)

Standard EC.02.01.01

The [critical access] hospital manages safety and security risks.

scanner room and the area that immediately precedes the entrance to the MRI scanner room.

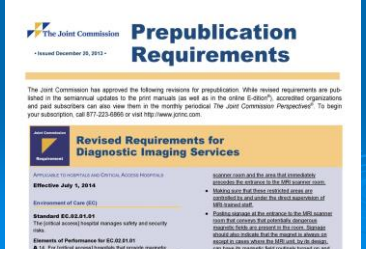
- Making sure that these restricted areas are controlled by and under the direct supervision of MRI trained staff.
- Posting signage at the entrance to the MRI scanner room that conveys that potentially dangerous magnetic fields are present in the room. Signage should also indicate that the magnet is always on

The Joint Commission

- On December 20, 2013 TJC published "Revised Requirements for Diagnostic Imaging Services" effective July 1, 2014.
- On May 19, 2014, they delayed implementation
  - Cited the "significant feedback from key stakeholders"… that "shed light on issues" not identified or sufficiently evaluated.

The Joint Commission

- On January 9, 2015 TJC published "Revised Requirements for Diagnostic Imaging Services" effective July 1, 2015.



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Elements of Performance for EC.02.01.01

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- Making sure that these restricted areas are controlled by and under the direct supervision of MRI trained staff.
- Posting signage at the entrance to the MRI scanner room that conveys that potentially dangerous magnetic fields are present in the room. Signage should also indicate that the magnet is always on except in cases where the MRI unit, by its design,

TJC & CMS

- TJC
  - Elements of Performance (EP).
    - Leadership (LD)
    - Medication Management (MM)
    - Environment of Care (EC)
    - Medical Staff (MS)
- CMS
  - Conditions of Participation (CoP)

Title 42

§482.53

The Joint Commission

- EPs in 2009 were expanded to cover 42CFR482.53 (Nuclear Medicine).
- Areas addressed include:
  - Radiopharmaceutical management
  - QA/QC
  - Physician oversight
  - Staff training
  - Records retention
  - Waste management

42 CFR 482.53

The Joint Commission

Hospital Crosswalk

Medicare Hospital Requirements to 2011 Joint Commission Hospital Standards & EPs

CFR Number	Medicare Standards	Joint Commission Equivalent Number	Joint Commission Standards
§482.53	TAG: A-1026	LD.01.03.01	The governing body is ultimately accountable for the safety and quality of care, treatment, and services.
§482.53 Condition of Participation: Nuclear Medicine Services If the hospital provides nuclear medicine services, those services must meet the needs of the patients in accordance with acceptable standards of practice.		EP 3	The governing body approves the hospital's written scope of services. (See also PC.01.01.01, EP 7) Note: For hospitals that use Joint Commission accreditation for deemed status purposes: If emergency services are provided at the hospital, the hospital complies with the requirements of 42 CFR 482.55. For more information on 42 CFR 482.55, refer to the "Medicare Requirements for Hospitals" appendix.
		EP 5	The governing body provides for the resources needed to maintain safe, quality care, treatment, and services. (See also NR.01.01.01, EP 3)
		LD.04.01.01	The hospital complies with law and regulation.
		EP 2	The hospital provides care, treatment, and services in accordance with licensure requirements, laws, and rules and regulations.

All Joint Commission resources must be purchased.

The organization of the nuclear medicine service must be appropriate to the scope and complexity of the services offered.

§482.53(a)	TAG: A-1027	NR.01.02.01	The hospital defines staff qualifications.
§482.53(a) Standard: Organization and Staffing The organization of the nuclear medicine service must be appropriate to the scope and complexity of the services offered.		EP 1	The hospital defines staff qualifications specific to their job responsibilities. (See also IC.01.01.01, EP 3 and RI.01.01.03, EP 2) Note I: Qualifications for infection control may be met through ongoing education, training, experience, and/or certification (such as that offered by the Certification Board for Infection Control). Note 2: Qualifications for licensed practitioners are detailed in the Clinical Laboratory Improvement Amendments of 1988 (CLIA '88), under Subpart M: "Personnel for Nonwaived Testing" §493.1351-§493.1495. A complete description of the requirement is located at http://www.cdc.gov/clia/regs/toc.aspx. Note 3: For hospitals that use Joint Commission accreditation for deemed status purposes: Qualified physical therapists, physical therapist assistants, occupational therapists, occupational therapy assistants, speech-language pathologists, or audiologists (as defined in 42 CFR 484.4) provide physical therapy, occupational therapy, speech-language pathology, or audiology services, if these services are provided by the hospital. Note 4: Qualifications for language interpreters and translators may be met through language proficiency assessment, education, training, and experience. The use of qualified interpreters and translators is supported by the Americans with Disabilities Act, Section 504 of the Rehabilitation Act of 1973, and Title VI of the Civil Rights Act of 1964. (Inclusion of these qualifications will not affect the accreditation decision at this time.)
		LD.01.03.01	The governing body is ultimately accountable for the safety and quality of care, treatment, and services.
		EP 3	The governing body approves the hospital's written scope of services. (See also PC.01.01.01, EP 7) Note: For hospitals that use Joint Commission accreditation for deemed status purposes: If emergency services are provided at the hospital, the hospital complies with the requirements of 42 CFR 482.55. For more information on 42 CFR 482.55, refer to the "Medicare Requirements for Hospitals" appendix.
		EP 5	The governing body provides for the resources needed to maintain safe, quality care, treatment, and services. (See also NR.01.01.01, EP 3)
		LD.03.06.01	Those who work in the hospital are focused on improving safety and quality.
		EP 3	Leaders provide for a sufficient number and mix of individuals to support safe, quality care, treatment, and services. (See also IC.01.01.01, EP 3) Note: The number and mix of individuals is appropriate to the scope and complexity of the services offered.
		EP 4	Those who work in the hospital are competent to complete their assigned responsibilities.
		LD.04.01.11	The hospital makes space and equipment available as needed for the provision of care, treatment, and services.
		EP 2	The arrangement and allocation of space supports safe, efficient, and effective care, treatment, and services.
		EP 5	The leaders provide for equipment, supplies, and other resources.

482.52(c)(2) Nuclear Medicine equipment must be inspected, tested and calibrated annually.

EP14 (EC) Qualified hospital staff inspect, test, and calibrate nuclear medicine equipment annually. The dates of these activities are documented.

Testing of image acquisition systems is greatly expanded in the new 2015 TJC Standards.

A 19. @ For [critical access] hospitals that provide diagnostic computed tomography (CT) services: At least annually, a diagnostic medical physicist conducts a performance evaluation of all CT imaging equipment. The evaluation results, along with recommendations for correcting any problems identified, are documented. The evaluation includes the use of phantoms to assess the following imaging metrics:

- Image uniformity
- Slice thickness accuracy
- Slice position accuracy (when prescribed from a scout image)
- Alignment light accuracy
- Table travel accuracy
- Radiation beam width
- High-contrast resolution
- Low-contrast resolution
- Geometric or distance accuracy
- CT number accuracy and uniformity
- Artifact evaluation

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May 31, 2015

RE: Annual CT inspection, Siemens Definition Cardiovascular CT Scanner, Room 1925 DT

On May 26, 2015, I performed an annual inspection on the Siemens cardiovascular-dual energy CT scanner located in the Main Hospital, room 1925 Davis Tower. The following tests were performed:

Test	Result
Image Uniformity	PASS
Slice Thickness Accuracy	PASS
Slice Position Accuracy (prescribed from scout)	PASS
Alignment Light Accuracy	PASS
Table Travel Accuracy	PASS
Radiation Beam Width	PASS
High Contrast Resolution	PASS
Low Contrast Resolution	PASS
Geometric or Distance Accuracy	PASS
CT Number Accuracy and Uniformity	PASS
Artifact Evaluation	PASS
Radiation Dosimetry	PASS
Gray Level Performance of CT Acquisition Display	PASS
Evaluation of Technologist Continuous QC Program	PASS

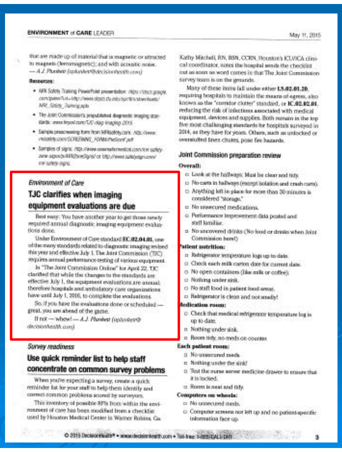
In summary, the system is performing within expected limits, provides accurate CT numbers, has good uniformity, demonstrates expected spatial resolution, and indicates $CTDI_{vol}$ values within +/- five percent for head and body imaging protocols. Since implementation of the "SAFIRE" iterative reconstruction software, the system is consistently providing high quality, low dose images for most protocols. The attached report has detailed measurements.

Daily Quality Control data acquired by the technologists and evaluated by software programs resident on the CT scanner demonstrates reproducible performance metrics. The monthly checklist includes evaluation of the console monitor used for displaying CT images in addition to general verification of system operation. Should you have any questions regarding this report, please contact me directly.

J. Anthony Seibert, Ph.D.

Test	Result
Image Uniformity	PASS
Slice Thickness Accuracy	PASS
Slice Position Accuracy (prescribed from scout)	PASS
Alignment Light Accuracy	PASS
Table Travel Accuracy	PASS
Radiation Beam Width	PASS
High Contrast Resolution	PASS
Low Contrast Resolution	PASS
Geometric or Distance Accuracy	PASS
CT Number Accuracy and Uniformity	PASS
Artifact Evaluation	PASS
Radiation Dosimetry	PASS
Gray Level Performance of CT Acquisition Display	PASS
Evaluation of Technologist Continuous QC Program	PASS

Because the testing is annual, TJC says that they will not cite facilities until July 1, 2016.



ENVIRONMENT of CARE LEADER — May 11, 2015

that are made up of material that is magnetic or attracted to magnets (ferromagnetic); and with acoustic noise. — *A.J. Plunkett (aplunkett@decisionhealth.com)*

Resources:

- MRI Safety Training PowerPoint presentation: [illegible]
- The Joint Commission's prepublished diagnostic imaging standards: [illegible]
- Sample prescreening form from MRIsafety.com: [illegible]
- Samples of signs: [illegible]

Environment of Care

TJC clarifies when imaging equipment evaluations are due

Rest easy: You have another year to get those newly required annual diagnostic imaging equipment evaluations done.

Under Environment of Care standard **EC.02.04.01**, one of the many standards related to diagnostic imaging revised this year and effective July 1, The Joint Commission (TJC) requires annual performance testing of various equipment.

In "The Joint Commission Online" for April 22, TJC clarified that while the changes to the standards are effective July 1, the equipment evaluations are annual; therefore hospitals and ambulatory care organizations have until July 1, 2016, to complete the evaluations.

So, if you have the evaluations done or scheduled — great, you are ahead of the game.

If not — whew! — *A.J. Plunkett (aplunkett@decisionhealth.com)*

Survey readiness

Use quick reminder list to help staff concentrate on common survey problems

When you're expecting a survey, create a quick reminder list for your staff to help them identify and correct common problems scored by surveyors.

This inventory of possible RFIs from within the environment of care has been modified from a checklist used by Houston Medical Center in Warner Robins, Ga.

Kathy Mitchell, RN, BSN, CCRN, Houston's ICU/ICA clinical coordinator, notes the hospital sends the checklist out as soon as word comes in that The Joint Commission survey team is on the grounds.

Many of these items fall under either **LS.02.01.20**, requiring hospitals to maintain the means of egress, also known as the "corridor clutter" standard, or **IC.02.02.01**, reducing the risk of infections associated with medical equipment, devices and supplies. Both remain in the top five most challenging standards for hospitals surveyed in 2014, as they have for years. Others, such as unlocked or overstuffed linen chutes, pose fire hazards.

Joint Commission preparation review

Overall:

- ☐ Look at the hallways: Must be clear and tidy.
- ☐ No carts in hallways (except isolation and crash carts).
- ☐ Anything left in place for more than 30 minutes is considered "storage."
- ☐ No unsecured medications.
- ☐ Performance improvement data posted and staff familiar.
- ☐ No uncovered drinks (No food or drinks when Joint Commission here!)

Patient nutrition:

- ☐ Refrigerator temperature logs up to date.
- ☐ Check each milk carton date for current date.
- ☐ No open containers (like milk or coffee).
- ☐ Nothing under sink.
- ☐ No staff food in patient food areas.
- ☐ Refrigerator is clean and not smelly!

Medication room:

- ☐ Check that medical refrigerator temperature log is up to date.
- ☐ Nothing under sink.
- ☐ Room tidy, no meds on counter.

Each patient room:

- ☐ No unsecured meds.
- ☐ Nothing under the sink!
- ☐ Test the nurse server medicine drawer to ensure that it is locked.
- ☐ Room is neat and tidy.

Computers on wheels:

- ☐ No unsecured meds.
- ☐ Computer screens not left up and no patient-specific information face up.

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Institutional Oversight

- RSC
  - Radiation Safety Committee
    - License compliance
    - Serves as oversight and review of amendments

Institutional Oversight

- IRB
  - Institutional Review Board
    - Experimental drugs in clinical trials
      - Under IND, NDA, HUD
    - Experimental uses of new imaging equipment
    - Experimental radiotherapy
    - Standard of Care imaging or radiotherapy associated with a clinical trial

Institutional Oversight

- RDRC
  - Radioactive Drug Research Committee
    - Chartered by the FDA (21CFR361.1)
    - Use of radiotracers for basic research

Professional Organizations

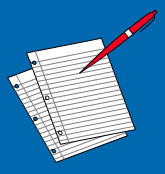
- Well respected
- Provide guidance documents
- Provide continuing education
- Credentialing
- Accreditation

Key Elements in Preparedness

- Know what is required based on the regulations, your license conditions, and your procedures.
- Make tables or lists of what needs to be done and their frequency.
- The Radiation Safety & Compliance Program should be on an annual review cycle. (10 CFR 20.1101)
- DOCUMENT! DOCUMENT! DOCUMENT!

Documentation

- Must be readily accessible.
- Filed in a logical manner.
- Forms must be legible (in INK) and rational to both staff and the **inspector**.
- The documentation should clearly state:
  - Who
  - What
  - Where
  - When



Corrective Actions

Summary

- Model your program after NUREG 1556, vol 9 and/or other guidance documents.
- Radiation safety elements (package receipt, QA, waste management, training, credentialing) will come up in inspections.
- Be sure the staff at your facility know who you are (Radiation Safety Officer) and how they can get in touch with you.
- Compliance with TJC will likely cover a facility in terms of CMS.

Thank You for your Attention

Possible New Written Directive Requirements

- Pre- Implantation:
  - Radionuclide
  - Treatment site
  - ~~Dose~~
  - Intended absorbed dose to treatment site
  - Total Source Strength (SS) to deliver the dose
  - Expected dose to normal issues within treatment site (i.e., urethra)

Written Directive Requirements

- Post- Implantation but before procedure end:
  - ~~Radionuclide~~
  - ~~Treatment Site~~
  - # of Sources implanted
  - Total Source Strength
  - ~~Exposure time~~
  - AU signature and date

Written Directive Procedures Proposed New Procedures

- 10 CFR 35.41(b)
  - Determine if Medical Event has occurred
  - Source position verification within 60 Days:
    - Total SS outside Treatment Area compared to the total SS in post-implantation WD
    - Absorbed Dose to the maximally exposed 5 contiguous cc of normal tissue outside of Treatment Site
    - Absorbed Dose to maximally exposed 5 contiguous cc of normal tissue inside Treatment Site

Medical Event Criteria Permanent Implant Only

- Total SS administered differs by 20% or more from the documented SS in Post-implant WD.
- Total SS administered outside of Treatment site exceeds 20% of the documented SS in the post-implant portion of WD.
- Absorbed dose to 5 contiguous cc of normal tissue outside of Treatment site exceeds 50% of the absorbed dose prescribed to the Treatment site in Pre-implant WD.

Medical Event Criteria Permanent Implant Only (cont.)

- Absorbed dose to 5 contiguous cc of normal tissue located within the treatment site exceeds by 50% or more the dose to that tissue based on the pre-implant distribution approved by the AU.

Medical Event Criteria Permanent Implant Only (cont.)

- An administration that includes any of the following:
  - Wrong radionuclide
  - Wrong person
  - Sealed source delivered to wrong treatment site
  - A leaking source resulting in 0.5 Sv to an organ or tissue
  - A 20% or more error in calculating the SS documented in the pre-implant WD

How to get the dose information (CTDIvol, DLP or SSDE) into the interpretive report?

- Dictate
  - Tedious
  - Prone to error
  - Hard to search in the future
- Import the data

University of California - UC DOSE

- Electronically send CT dose page to PACS
- Automated import of CTDIvol and DLP to report
  - Implementation of dose calculation software engine
  - Extraction of series by series CT dose metrics
  - Inclusion of user defined message in speech engine
  - Creation of final report in RIS with dose metrics
  - Provide brief explanatory text in report

Example Reports

EXAM: CT ABDOMEN + CT PELVIS, WITH CONTRAST

DATE OF STUDY: 10/9/2012 11:29 AM

CLINICAL INFORMATION: Pain(acute), location: Pelvis: Left Other, specify: left hernia Bowel Comments:

TECHNIQUE: Helically acquired contrast enhanced multidetector CT of the abdomen and pelvis acquired in the portal venous phase, extending from the lung bases through the groins. Uneventful administration of 125 ml of Omnipaque 350 injected at a rate of 2.5 ml/sec. Images are reconstructed in the axial pane with subsequent reformatting in coronal and sagittal planes.

No P.O. contrast was administered.

DOSE REPORT: This study involved (1) CT acquisition(s). The CTDIvol and DLP values are included below as required by state law:

1; Series: 3; Abdomen; 32 cm; CTDIvol=17.7 mGy; DLP=856.7 mGy-cm

For further information on CT radiation dose, see http://www.ucdmc.ucdavis.edu/radiology/RadiationDose.html

COMPARISON: None.

FINDINGS:

DATE: 10/9/2012 11:42 AM

EXAM TYPE: CT ANGIO CHEST WITH / WITHOUT CONTRAST

COMPARISON: 8/12/2011

INDICATION: History of 4-cm ectatic aorta. Follow-up CT.

TECHNIQUE: Helical scanning from the thoracic inlet through the adrenals was performed following the uneventful administration of 100 mL of Omnipaque 350 at a rate of 4.0-mL/s through a 20-gauge left antecubital vein. Reconstruction of 5-mm and 1.0 mm contiguous axial images was performed. 5-mm contiguous coronal and sagittal images and 10 mm contiguous MIP axial images were reformatted.

RADIATION DOSE:
This study involved (3) CT acquisition(s). The CTDIvol and DLP values are included below as required by state law:
1; Series: 2; Chest; 32 cm; CTDIvol=2.9 mGy; DLP=3 mGy-cm
2; Series: 3; Chest; 32 cm; CTDIvol=26.4 mGy; DLP=26 mGy-cm
3; Series: 5; Chest; 32 cm; CTDIvol=13.5 mGy; DLP=692 mGy-cm
For further information on CT radiation dose, see http://www.ucdmc.ucdavis.edu/radiology/RadiationDose.html

FINDINGS:

Implementation Considerations

- Radiologist speech templates must have a field to accept data for dose metric values
- Time for dose extraction step is needed (~10 minutes), before dose metrics are populated
- Exam splitting often results in different accession numbers with same dose metrics
- Radiologists request for minimal content (dose report often longer than anything else)