AAPM Spring Meeting 4/7/2018

Joint Commission Update: Diagnostic Imaging Services Standards, Survey Results, Fluoroscopy

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Objectives:

- Review of imaging standards
- Present data for diagnostic imaging services RFIs scored in 2017
- Provide examples specific items scored in diagnostic imaging
- Describe proposed fluoroscopy standards and approval process

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Where are the standards that can be applied to imaging?

- Environment of Care Chapter
- Human Resources
- Medical Staff
- Medication Management
- Leadership
- Provision of Care, Treatment and Services
- Performance Improvement

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Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.01.01 Manages safety & security risks
    - EP8 Controls access security sensitive areas
    - EP11 Responds to product notices and recalls
    - EP14 Manages MRI safety risks (patients/staff)
    - EP 16 Manages MRI safety risks (access control/ signage)

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Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.02.01 Manages risks: hazardous materials and waste
    - EP3 Written procedures (precautions/PPE) response hazardous material, waste spills, exposures
    - EP6 Minimizes risk selecting, handling, storing, transporting, using & disposing RA material
    - EP7 Minimizes risk selecting/using hazardous energy sources (ionizing, nonionizing)

Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.02.01 Manages risks: hazardous materials and waste
    - EP17 CT, NM, PET, Fluoro dosimetry monitoring results reviewed quarterly
    - EP18 Deemed status orgs periodic check for amount of radiation exposure
    - CMS Operations Manual 141 7/10/15

Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.04.01 Manages medical equipment risks
    - EP2 Non-deemed: inventory all/selected; deemed: inventory all
    - EP4 ID activities/frequencies (writing) maintaining, inspecting, testing
    - EP5 Deemed status: manufacturer's recommendations (medical lasers, imaging & radiologic)

Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.04.01 Manages medical equipment risks
    - EP9 Written procedures medical equipment failure (emergency clinical interventions, backup equipment)
    - EP10 IDs QC & maintenance activities (frequency) to maintain image quality (CT, MRI, NM, PET)

Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.04.03 Inspects, tests, maintains medical equipment
    - EP1 Non-deemed: before initial use (safety, operational, functional checks)
    - Deemed: before initial use & after major repairs or upgrades
    - EP16 Qualified staff inspect, test, calibrate NM equipment annually (documented)

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Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.04.03 Inspects, tests, maintains medical equipment
    - EP18 Maintains quality CT, PET, MRI, NM images produced
    - EP 20 Annually medical physicist measures CTDI 4 protocols; verifies measured/displayed within 20% (systems capable, not dental cone beam, accountable may have assistance)

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Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.04.03 Inspects, tests, maintains medical equipment
    - EP 21 Annually diagnostic medical physicist CT tests
    - EP 22 Annually diagnostic MP/MRI scientist MRI tests
    - EP 23 Annually diagnostic MP/NM physicist tests all NM imaging equipment
    - EP 24 Annually diagnostic MP tests PET
    - EP 25 CT, PET, NM, MRI tests acquisition monitors

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Where are the standards that can be applied to imaging?

- Environment of Care
  - 02.06.05 Manages environment: demolition, renovation, new construction
  - EP 1 Uses state rules/regulations; Guidelines for Design and Construction of Health Care Facilities 2014 (FGI/ASHE)
  - EP 4 CT, PET, NM structural shielding design assessment
  - EP 6 CT, PET, NM after work BEFORE clinical use conducts radiation protection survey

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Where are the standards that can be applied to imaging?

- Environment of Care
  - 03.01.01 Staff/LIP familiar w/ roles/responsibilities relative to EC
  - EP 1 Staff responsible: maintenance, inspection, testing, use medical equipment…..safe handling hazardous materials…competent, receive continuing education/training
  - EP 2 Staff/LIP describe/demonstrate actions in EC incident

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Where are the standards that can be applied to imaging?

- Environment of Care
  - 04.01.01 Collect information to monitor conditions in environment
  - EP 1 Establish process continually monitor, internally report & investigate
    - Hazardous materials/waste spills & exposures
    - Medical/laboratory equipment management problems, failures, use errors

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January 1, 2018

EC.01.01.01 EP 3: The organization has a library of information regarding inspection, testing, and maintenance of its equipment and systems.

Note: This library includes manuals, procedures provided by manufacturers, technical bulletins, and other information.

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Where are the standards that can be applied to imaging?

- Human Resources
  - 01.05.03 Ongoing education and training
  - EP 14 Diagnostic CT technologists annual; dose optimization, safe operation equipment used
  - EP 25 MRI technologists annual; patient screening, patient/equipment positioning, classification, procedures urgent/emergent care, system shutdown, hearing protection, patients with claustrophobia, anxiety, emotional distress

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Where are the standards that can be applied to imaging?

- Leadership
  - 04.03.09 Contractual agreement; care, treatment, services provided safely/effectively
  - EP 4 Monitor: establish expectations
  - EP 5 Communicate expectation in writing
  - EP 6 Evaluate relative to expectations
  - EP 7 Take steps to improve if expectations not met

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Where are the standards that can be applied to imaging?

- Medication Management
  - 06.01.01 Safely administers medication
  - EP 13 Diagnostic RRx verify dose to be administered within 20% prescribed or within prescribed range
  - Contrast

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Where are the standards that can be applied to imaging?

- Medical Staff
  - 03.01.01 Oversees quality of care, treatment, services
  - EP 16 Deemed: determine qualifications radiology staff who use equipment & administer procedures (482.26(c)(2) TAG A-0547
  - EP 17 Deemed: Approves nuclear services doctor qualifications, training, functions, responsibilities NM staff

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Where are the standards that can be applied to imaging?

- Provision of Care, Treatment and Services (PC)
  - 01.02.15 Provides for diagnostic testing
  - EP 5 Documents CTDI, DLP, SSDE every diagnostic CT study (exam specific, summarized series/anatomic area, in retrievable format
  - EP 10 CT, MRI, NM, PET: prior to study verify correct patient, imaging site, positioning, CT protocol, CT scanner parameters
  - EP 12 CT, MRI, PET, NM: consider patient age, prior studies/ most appropriate imaging exam

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Where are the standards that can be applied to imaging?

- Provision of Care, Treatment and Services (PC)
  - 01.03.01 Plans patient care
  - EP 25 Established/adopts diagnostic CT imaging protocols; current standards of practice; address clinical indication, contrast administration, age (adult or peds), patient size/ body habitus, expected CTDI range
  - EP 26 Review/ keep current diagnostic CT imaging protocols; input interpreting physician, medical physicist, lead imaging technologist (current standards of practice/equipment used); frequency TBD by org

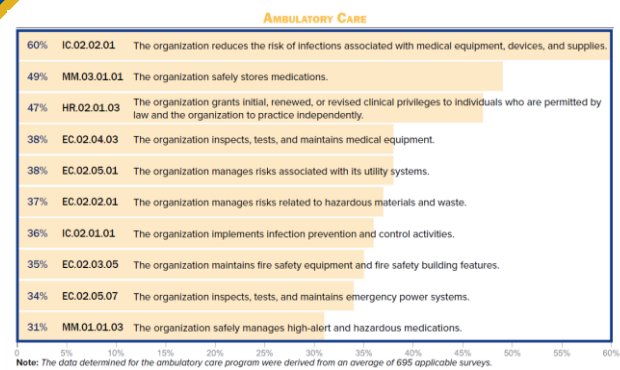
Where are the standards that can be applied to imaging?

- Performance Improvement
  - 01.01.01 Collects data to monitor performance
  - EP 46 Collects data MRI thermal injuries
  - EP 47 Collects data: unintentional ferromagnetic objects; injuries ferromagnetic objects

Where are the standards that can be applied to imaging?

- Performance Improvement
  - 02.01.01 Compiles and analyzes data
  - EP 6 Reviews/analyzes CTDIvol, DLP, SSDE diagnostic CT exceeded expected range in imaging protocols; compared to external benchmarks

Top Standards Compliance Data 2017



Top Standards Compliance Data 2017

HOSPITALS

86%	LS.02.01.35	The hospital provides and maintains systems for extinguishing fires.
73%	EC.02.05.01	The hospital manages risks associated with its utility systems.
72%	LS.02.01.30	The hospital provides and maintains building features to protect individuals from the hazards of fire and smoke.
72%	IC.02.02.01	The hospital reduces the risk of infections associated with medical equipment, devices, and supplies.
70%	EC.02.06.01	The hospital establishes and maintains a safe, functional environment.
66%	LS.02.01.10	Building and fire protection features are designed and maintained to minimize the effects of fire, smoke, and heat.
63%	EC.02.02.01	The hospital manages risks related to hazardous materials and waste.
62%	LS.02.01.20	The hospital maintains the integrity of the means of egress.
62%	EC.02.05.05	The hospital inspects, tests, and maintains utility systems.
59%	EC.02.05.09	The hospital inspects, tests, and maintains medical gas and vacuum systems.

0 5% 10% 15% 20% 25% 30% 35% 40% 45% 50% 55% 60%

Note: *The data determined for the hospital program were derived from 1,443 applicable surveys.*

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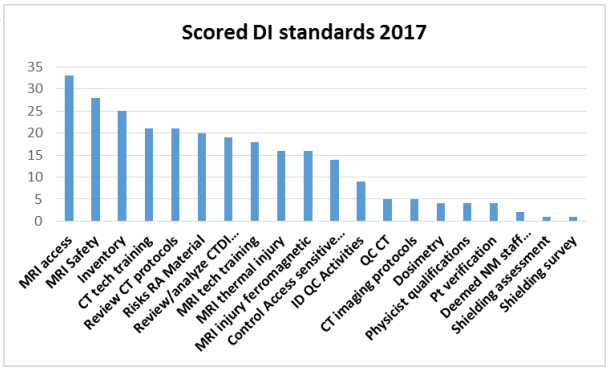

N = 266

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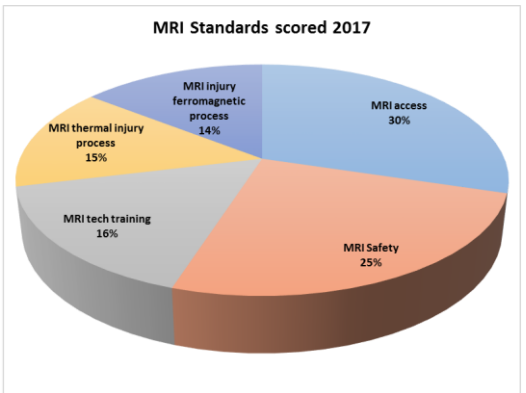

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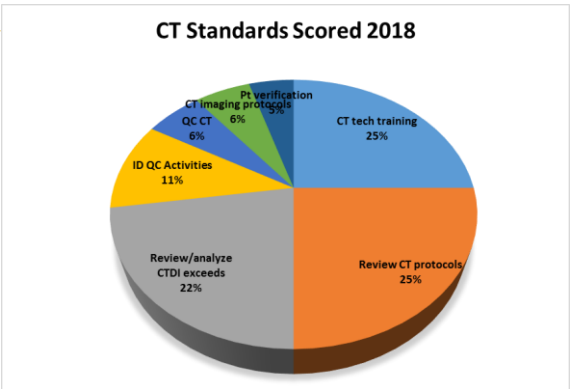

N = 84

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Typical Surveyor Observations

- EC.02.01.01
- Access to hot lab; after hours
  - Key code not changed; keys not returned
- Ferrous fire extinguishers Zone 3.
- MRI doors unlocked or open w/o staff there
- Incomplete screening documents or policy
- Surveyor administrator allowed in Zone 4 w/o screen
- MRI staff could not articulate emergency procedure
- EC.02.02.01
- No badges or not wearing
  - Checking with staff during tracer
- Policy annual apron inspection; not done
  - Lost apron policy

Typical Surveyor Observations

- EC.02.04.03
- CT/ MRI QC not done according to policy
- Policy: radiographic equipment -not done
- Looking at both PM and physicist survey
- Incomplete annuals
- Maintenance/ testing not meeting manufacturer's recommendations

Typical Surveyor Observations

- PC.01.02.15
- Siemens CT/ GE protocols
- Contrast discrepancies; not follow protocol
- No CT imaging protocols
- Insufficient contrast guidance
- Changes in protocols w no verifications, initials etc.
- No time frame for CT protocol review

Typical Surveyor Observations

- PI.01.01.01
- No process for reporting thermal injuries
- Incident reports; no data collected/analyzed
- No process for ferromagnetic objects
- PI.02.01.01
- No process for CTDI data
- Collected data but didn't review/ analyze

What's New

Joint Commission Requirement

Official Publication of Joint Commission Requirements

Revisions for Organizations Providing Fluoroscopy Services

Effective July 1, 2018

Environment of Care (EC)

Standard EC.02.02.01: The [organization] manages risks related to hazardous materials and waste.

AMBULATORY CARE:

EP 7. The organization minimizes risks associated with the selection and use of hazardous energy sources.

Note 1: *Hazardous energy is produced by both ionizing equipment (for example, radiation and x-ray equipment) and nonionizing equipment (for example, lasers and MRIs).*

Note 2: *This includes the use of proper shielding during fluoroscopic procedures.*

EP 17. **For organizations that provide computed tomography (CT), positron emission tomography (PET), ~~or~~ nuclear medicine (NM), or fluoroscopy services:** The results of staff dosimetry monitoring are reviewed at least quarterly by the radiation safety officer, diagnostic medical physicist, or health physicist to assess whether staff radiation exposure levels are "as low as reasonably achievable" (ALARA) and below regulatory limits.

Note 1: *For the definition of ALARA, please refer to US Nuclear Regulatory Commission federal regulation 10 CFR 20.1003.*

Note 2: *This element of performance does not apply to dental cone beam CT radiographic imaging studies performed for diagnosis of conditions affecting the maxillofacial region or to obtain guidance for the treatment of such conditions.*

CRITICAL ACCESS HOSPITALS:

EP 7. The critical access hospital minimizes risks associated with selecting and using hazardous energy sources.

Note 1: *Hazardous energy is produced by both ionizing equipment (for example, radiation and x-ray equipment) and nonionizing equipment (for example, lasers and MRIs).*

Note 2: *This includes the use of proper shielding during fluoroscopic procedures.*

EP 17. **For critical access hospitals that provide computed tomography (CT), positron emission**

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The Process

The Joint Commission develops and updates its standards for health care organizations that seek or maintain accreditation, based on current science to address emerging health care quality issues. These voluntary standards are established after extensive literature review, input from national experts and other stakeholders.

The process involves:

- Extensive research and literature review
- A technical advisory panel representing imaging leadership and clinicians, researchers and practitioners from leading hospitals and other organizations across the country.
- A standards review panel to provide real-world practice perspectives and Input on the new and revised standards.

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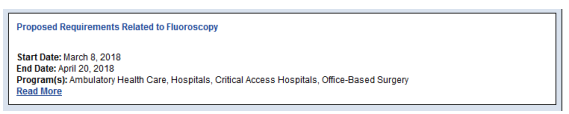
Hover over Standards; Select Field Review



Open until 4/20/2018

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Environment of Care (EC) Chapter

EC.02.04.03

1 The hospital inspects, tests, and maintains medical equipment.

Proposed Standards Revisions that Relate to Fluoroscopy Services

21. For 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

Note 1: This element of performance does not apply to dental cone beam CT radiographic imaging studies performed for diagnosis of conditions affecting the maxillofacial region or to obtain guidance for the treatment of such conditions.
Note 2: Medical physicists are accountable for these activities. They may be assisted with the testing and evaluation of equipment performance by individuals who have the required training and skills, as

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Environment of Care (EC) Chapter

EC.02.04.03

1 The hospital inspects, tests, and maintains medical equipment.

182 **34. For hospitals that provide fluoroscopic services: At least annually, a diagnostic medical**
183 **physicist or health physicist conducts a performance evaluation of fluoroscopic imaging**
184 **equipment. The evaluation results, along with recommendations for correcting any problems**
185 **identified, are documented. The evaluation includes an assessment of the following:**
186 **- Beam alignment and collimation**
187 **- Tube potential/kilovolt peak (kVp) accuracy**
188 **- Beam filtration (half-value layer)**
189 **- High-contrast resolution**
190 **- Low-contrast resolution**
191 **- Exposure rate for typical exams**
192 **- Maximum exposure rate**
193 **- Patient dose display accuracy (where applicable)**
194 **- Automatic dose rate and automatic exposure control performance**

Human Resources (HR) Chapter

HR.01.05.03

195 Staff participate in ongoing education and training.

210 **14. The hospital verifies and documents that individuals who perform diagnostic computed**
211 **tomography (CT) and/or fluoroscopic examinations participate in ongoing education that**
212 **includes annual training on the following:**
213 **- Radiation dose optimization techniques and tools for pediatric and adult patients addressed**
214 **in the Image Gently®, Image Gently-Step Lightly®, and Image Wisely® campaigns**
215 **- Safe procedures for operation of the types of CT and fluoroscopy equipment they will use**
216 **Note 1: Information on the Image Gently, Image Gently-Step Lightly, and Image Wisely**
217 **initiatives can be found online at http://www.imagegently.org and http://www.imagewisely.org,**
218 **respectively.**
219 **Note 2: This element of performance does not apply to CT systems used for therapeutic**
220 **radiation treatment planning or delivery, or for calculating attenuation coefficients for nuclear**
221 **medicine studies.**
222 **Note 3: This element of performance does not apply to dental cone beam CT radiographic**
223 **imaging studies performed for diagnosis of conditions affecting the maxillofacial region or to**
224 **obtain guidance for the treatment of such conditions.**

Leadership (LD) Chapter

LD.04.01.05

278 **25. For hospitals that provide fluoroscopic services: The hospital designates an individual to**
279 **serve as the radiation safety officer. This individual is responsible for making certain that**
280 **radiologic services are provided in accordance with law, regulation, and organizational policy.**

Provision of Care, Treatment, and Services (PC) Chapter

PC.01.02.15

281 The hospital provides for diagnostic testing.

317 **13. For hospitals that provide fluoroscopic services: The reference-air kerma, cumulative-air**
318 **kerma, or kerma-area product are documented in a retrievable format. For fluoroscopy**
319 **equipment that is not designed to display reference-air kerma, cumulative-air kerma, or kerma-**
320 **area product, fluoroscopy time and number of images acquired are documented in a**
321 **retrievable format, such as a picture archiving and communication system.**

PC.01.03.01

322 The hospital plans the patient's care.

348 **25. The hospital establishes or adopts diagnostic computed tomography (CT) and fluoroscopy**
349 **imaging protocols based on current standards of practice, which address key criteria**
350 **including the following:**
351 **- Clinical indication**
352 **- Contrast administration**
353 **- Age (to indicate whether the patient is pediatric or an adult)**
354 **- Patient size and body habitus**
355 **- For diagnostic computed tomography: The expected radiation dose index range**
356 **- For fluoroscopy: Expected ranges for the reference-air kerma, cumulative-air kerma, kerma-**
357 **area product, and fluoroscopy time. For fluoroscopy equipment that is not designed to display**
358 **reference-air kerma, cumulative-air kerma, or kerma-area product, expected ranges for**
359 **fluoroscopy times are addressed in protocols.**
360 **Note: This element of performance does not apply to dental cone beam CT radiographic**
361 **imaging studies performed for diagnosis of conditions affecting the maxillofacial region or to**
362 **obtain guidance for the treatment of such conditions.**

PC.01.03.01

322 The hospital plans the patient's care.

372 **26. Diagnostic computed tomography (CT) and fluoroscopy imaging protocols are reviewed and**
373 **kept current with input from an interpreting physician, medical physicist, and lead imaging**
374 **technologist to make certain that they adhere to current standards of practice and account for**
375 **changes in CT and fluoroscopy imaging equipment. These reviews are conducted at time**
376 **frames identified by the hospital. (For hospitals that use Joint Commission accreditation for**
377 **deemed status purposes, refer to MS.06.01.03, EP 9 for supervision of radiologic services)**
378 **Note: This element of performance does not apply to dental cone beam CT radiographic**
379 **imaging studies performed for diagnosis of conditions affecting the maxillofacial region or to**
380 **obtain guidance for the treatment of such conditions.**

PC.02.01.01

389 The hospital provides care, treatment, and services for each patient.

399 **30. For hospitals that provide fluoroscopic services: The hospital establishes criteria for patient**
400 **follow-up to assess for adverse radiation effects when the reference-air kerma, cumulative-air**
401 **kerma, kerma-area product, or fluoroscopy time exceeded expected ranges identified in**
402 **fluoroscopy imaging protocols. (See also PI.02.01.01, EP 20)**

Performance Improvement (PI) Chapter

PI.02.01.01

403 The hospital compiles and analyzes data.

442 **20. For hospitals that provide fluoroscopic services: The hospital reviews and analyzes incidents**
443 **where the reference-air kerma, cumulative-air kerma, kerma-area product, or fluoroscopy time**
444 **exceeded expected ranges identified in fluoroscopy imaging protocols. For fluoroscopy**
445 **equipment that is not designed to display reference-air kerma, cumulative-air kerma, or kerma-**
446 **area product, only fluoroscopy times that exceeded expected ranges are reviewed and**
447 **analyzed by the hospital. (See also PC.02.01.01, EP 30)**

Working Timeline

4/23 Submit final standards to Dir for approval

4/30 Send 60-day CMS notification

5/4 Send Perspectives article to PUBS for July issue

July 2018 –Post pre-pub standards

Jan 1, 2019 Implementation date

Questions?

Thank You!

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