The Diagnostic Radiology Milestone Project

A Joint Initiative of

The Accreditation Council for Graduate Medical Education

and

The American Board of Radiology

July 2015

The Diagnostic Radiology Milestone Project

The Milestones are designed only for use in evaluation of resident physicians in the context of their participation in ACGME accredited residency or fellowship programs. The Milestones provide a framework for the assessment of the development of the resident physician in key dimensions of the elements of physician competency in a specialty or subspecialty. They neither represent the entirety of the dimensions of the six domains of physician competency, nor are they designed to be relevant in any other context.

Diagnostic Radiology Milestones

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Milestone Reporting

This document presents milestones designed for programs to use in semi-annual review of resident performance and reporting to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME competencies organized in a developmental framework from less to more advanced. They are descriptors and targets for resident performance as a resident moves from entry into diagnostic radiology residency through graduation. In the initial years of implementation, the Review Committee will examine milestone performance data for each program's residents as one element in the Next Accreditation System (NAS) to determine whether residents overall are progressing.

For each reporting period, review and reporting will involve selecting the level of milestones that best describes each resident's current performance level in relation to milestones. Milestones are arranged into numbered levels. Selection of a level implies that the resident substantially demonstrates the milestones in that level, as well as those in lower levels (see the figure on page v). A general interpretation of levels for diagnostic radiology is below:

Level 1: The resident demonstrates milestones expected of one who has had some education in diagnostic radiology.

Level 2: The resident is advancing and demonstrating additional milestones.

Level 3: The resident continues to advance and demonstrate additional milestones; the resident consistently demonstrates the majority of milestones targeted for residency.

Level 4: The resident has advanced so that he or she now substantially demonstrates the milestones targeted for residency. This level is designed as the graduation target.

Level 5: The resident has advanced beyond performance targets set for residency and is demonstrating "aspirational" goals which might describe the performance of someone who has been in practice for several years. It is expected that only a few exceptional residents will reach this level.

Additional Notes

Level 4 is designed as the graduation *target* but does *not* represent a graduation *requirement*. Making decisions about readiness for graduation is the purview of the residency program director (See the Milestones FAQ for further discussion of this issue: "Can a resident/fellow graduate if he or she does not reach every milestone?"). Study of Milestone performance data will be required before the ACGME and its partners will be able to determine whether Level 4 milestones and milestones in lower levels are in the appropriate level within the developmental framework, and whether Milestone data are of sufficient quality to be used for high stakes decisions.

Some milestone descriptions include statements about performing independently. These activities must occur in conformity to the ACGME supervision guidelines, as well as to institutional and program policies. For example, a fellow who performs a procedure independently must, at a minimum, be supervised through oversight.

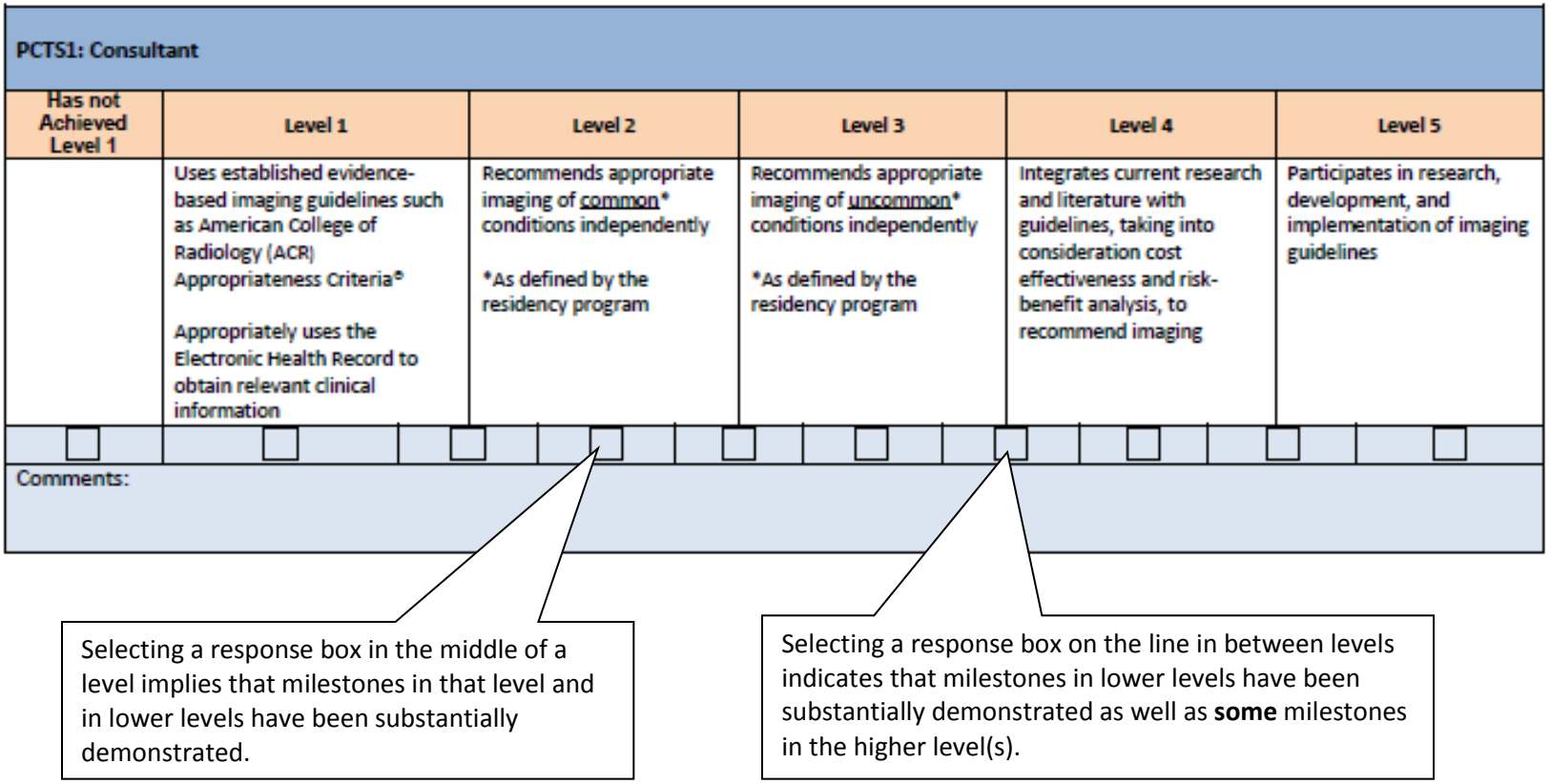
Answers to Frequently Asked Questions about Milestones are available on the Milestones web page: http://www.acgme.org/acgmeweb/Portals/0/MilestonesFAQ.pdf.

The figure below presents an example set of milestones for one sub-competency in the same format as the milestone report worksheet. For each reporting period, a resident's performance on the milestones for each sub-competency will be indicated by:

- selecting the level of milestones that best describes that resident's performance in relation to the milestones

or

- selecting the "Has not Achieved Level 1" response option



DIAGNOSTIC RADIOLOGY MILESTONES

ACGME REPORT WORKSHEET

Patient Care and Technical Skills (Residents must be able to meet previous year milestones when evaluated at a specific level)

PCTS1: Consultant					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Uses established evidence-based imaging guidelines such as American College of Radiology (ACR) Appropriateness Criteria® Appropriately uses the Electronic Health Record to obtain relevant clinical information	Recommends appropriate imaging of common* conditions independently *As defined by the residency program	Recommends appropriate imaging of uncommon* conditions independently *As defined by the residency program	Integrates current research and literature with guidelines, taking into consideration cost effectiveness and risk-benefit analysis, to recommend imaging	Participates in research, development, and implementation of imaging guidelines
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- 360 Evaluation/Multi-rater/Peer
- Direct observation and feedback
- End-of-Rotation Global Assessment
- Self-Assessment and Reflections/Portfolio
- End-of-Year Examination
- Simulation/OSCE

Patient Care and Technical Skills

PCTS2: Competence in procedures					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Competently performs basic procedures* under indirect supervision Recognizes and manages complications of basic procedures *Basic procedures, as defined by each residency program, include those needed to take independent call	Competently performs intermediate procedures, as defined by the residency program Recognizes and manages complications of intermediate procedures	Competently performs advanced procedures, as defined by the residency program Recognizes and manages complications of advanced procedures	Able to competently and independently perform the following procedures: • adult and pediatric fluoro studies • lumbar puncture • image-guided venous and arterial access • hands-on adult and pediatric ultrasound studies • drainage of effusions and abscesses • image-guided biopsy • nuclear medicine I-131 treatments (≤ 33 and > 33 mCi)	Able to teach procedures to junior-level residents Competently performs complex procedures, modifies procedures as needed, and anticipates and manages complications of complex procedures
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- 360 Evaluation/Multi-rater/Peer
- End-of-Rotation Global Assessment
- Case/Procedure Logs, including complications
- Direct observation and feedback
- Procedural competency checklists
- Self-Assessment and Reflections/Portfolio
- Simulation/OSCE

Medical Knowledge

MK1: Protocol selection and optimization of images					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Selects appropriate protocol and contrast agent/dose for basic imaging, including protocols encountered during independent call as defined by the residency program Recognizes sub-optimal imaging	Selects appropriate protocols and contrast agent/dose for intermediate imaging as defined by the residency program	Selects appropriate protocols and contrast agent/dose for advanced imaging as defined by the residency program Demonstrates knowledge of physical principles to optimize image quality	Independently modifies protocols as determined by clinical circumstances Applies physical principles to optimize image quality	Teaches and/or writes imaging protocols
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- Direct observation and feedback
- Self-Assessment and Reflections/Portfolio
- Core exam
- OSCE/simulation

Medical Knowledge

MK2: Interpretation of examinations					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Makes core observations, formulates differential diagnoses, and recognizes critical findings Differentiates normal from abnormal	Makes secondary observations, narrows the differential diagnosis, and describes management options	Provides accurate, focused, and efficient interpretations Prioritizes differential diagnoses and recommends management	Makes subtle observations Suggests a single diagnosis when appropriate Integrates current research and literature with guidelines to recommend management	Demonstrates expertise and efficiency at a level expected of a subspecialist Advances the art and science of image interpretation
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- Direct observation and feedback
- Reading out with resident
- ER preparedness test
- Review of reports
- Rate of major discrepancies
- Core exam

Systems-based Practice

SBP1: Quality Improvement (QI)					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Describes departmental QI initiatives Describes the departmental incident/occurrence reporting system	Incorporates QI into clinical practice Participates in the departmental incident/occurrence reporting system	Identifies and begins a systems-based practice project incorporating QI methodology	Completes a systems-based practice project as required by the ACGME Review Committee Describes national radiology quality programs (e.g., National Radiology Data Registry, accreditation, peer-review)	Leads a team in the design and implementation of a QI project Routinely participates in root cause analysis
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- 360 Evaluation/Multi-rater/Peer
- Direct observation and feedback
- Self-Assessment and Reflections/Portfolio
- Semi-annual evaluation with program director
- Written feedback on project (with mentor)
- Project presentation feedback (faculty, peers, others in system)
- Critical incidents reporting and feedback

Systems-based Practice

SBP2: Health care economics					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Describes the mechanisms for reimbursement, including types of payors	States relative cost of common procedures	Describes the technical and professional components of imaging costs	Describes measurements of productivity (e.g., RVUs)	Describes the radiology revenue cycle
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- Project presentation feedback (faculty, peers, others in system)
- Completion of knowledge-based modules

Suggested educational strategies:

- Annual QA session with head of billing
- Institute for Health Care International modules
- Agency for Healthcare Research and Quality modules

Practice-based Learning and Improvement

PBLI1: Patient safety: contrast agents; radiation safety; MR safety; sedation					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Contrast Agents: Recognizes and manages contrast reactions **Radiation Safety:** Describes the mechanisms of radiation injury and the ALARA ("as low as reasonably achievable") concept **MR Safety:** Describes risks of MRI	**Contrast Agents:** Re-demonstrates recognition and management of contrast reactions **Radiation Safety:** Accesses resources to determine exam-specific average radiation dose information **MR Safety:** Accesses resources to determine the safety of implanted devices and retained metal	**Contrast Agents:** Re-demonstrates recognition and management of contrast reactions **Radiation Safety:** Communicates the relative risk of exam-specific radiation exposure to patients and practitioners **MR Safety:** Communicates MR safety of common implants and retained foreign bodies to patients and practitioners	**Contrast Agents:** Re-demonstrates recognition and management of contrast reactions **Radiation Safety:** Applies principles of Image Gently® and Image Wisely® **MR Safety:** Applies principles of MR safety including safety zones and pre-MR screening **Sedation**: Describes the principles of conscious sedation	**Contrast Agents:** Teaches appropriate treatment of contrast reactions **Radiation Safety:** Promotes radiation safety **MR Safety:** Participates in establishing or directing a safe MR program **Sedation**: Selects appropriate sedation agent and dose for conscious sedation
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- 360 Evaluation/Multi-rater/Peer
- Simulation/OSCE
- Direct observation and feedback
- Self-Assessment and Reflections/Portfolio
- Completion of institutional safety modules, BCLS/ACLS

Practice-based Learning and Improvement

PBLI2: Self-Directed Learning					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Develops an annual learning plan based on self-reflection and program feedback	Evaluates and modifies learning plan	Evaluates and modifies learning plan	Evaluates and modifies learning plan	Advocates for lifelong learning at local and national levels
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- Semi-annual evaluation meeting with program director
- Self-Assessment and Reflections/Portfolio
- Resident teaching and feedback
- Core exam

Practice-based Learning and Improvement

PBLI3: Scholarly activity					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Documents training in critical thinking skills and research design	Works with faculty mentors to identify potential scholarly projects	Begins scholarly project	Completes and presents a scholarly project	Independently conducts research and contributes to the scientific literature and/or completes more than one scholarly project Completes an IRB submission
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- Self-Assessment and Reflections/Portfolio
- Core exam
- Journal club discussions
- Written feedback on project (with mentor)
- Project presentation feedback (faculty, peers, others in system)
- Completion of AJR Self-Assessment Modules or CITI modules

Professionalism

PROF1: Professional Values and Ethics					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Demonstrates the following professional behaviors: • recognizes the importance and priority of patient care and advocates for patient interests • fulfills work-related responsibilities • is truthful • recognizes personal limitations and seeks help when appropriate • recognizes personal impairment and seeks help when needed • responds appropriately to constructive criticism • places needs of patients before self • maintains appropriate boundaries with patients, colleagues, and others • exhibits tolerance and acceptance of diverse individuals and groups • maintains patient confidentiality • fulfills institutional and program requirements related to professionalism and ethics • attends required	Is an effective health care team member Demonstrates professional behaviors listed in the second column	Is an effective health care team leader, promoting primacy of patient welfare, patient autonomy, and social justice Demonstrates professional behaviors listed in the second column	Serves as a role model for professional behavior Demonstrates professional behaviors listed in the second column	Participates in local and national organizations to advance professionalism in radiology Mentors others regarding professionalism and ethics

	conferences					
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Comments:						

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- 360 Evaluation/Multi-rater/Peer
- Simulation/OSCE
- Direct observation and feedback
- Conference attendance logs
- Timeliness in completing institutional and program requirements

Suggested Educational Tools:

1. Teaching and Assessing Professionalism: A Program Director's Guide by the ABP and APPD – see Chapter 8: Measuring Professionalism
   - Critical incidents
   - Peer assessments
   - Multi-source assessments
   - Professionalism Mini-Evaluation Exercise (P-MEX)

2. The Professionalism Mini-Evaluation Exercise:
   A Preliminary Investigation
   - Richard Cruess, Jodi Herold McIlroy, Sylvia Cruess, Shiphra Ginsburg, and Yvonne Steinert Acad Med. 2006 Oct;81(10 Suppl):S74-8

3. ABRF Online Modules on Ethics and Professionalism
   https://www.abronline.org/asp/abrf/

4. "Medical Professionalism in the New Millennium: A Physician Charter." *Ann Intern Med*. 5 February 2002;136(3):243-246. "

Interpersonal and Communication Skills

ICS1: Effective communication with patients, families, and caregivers					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Communicates information about imaging and examination results in routine, uncomplicated circumstances Obtains informed consent	Communicates, under direct* supervision, in challenging circumstances (e.g., cognitive impairment, cultural differences, language barriers, low health literacy) Communicates, under direct supervision, difficult information such as errors, complications, adverse events, and bad news *see ACGME definition of direct supervision in the Program Requirements	Communicates, under indirect* supervision, in challenging circumstances (e.g., cognitive impairment, cultural differences, language barriers, low health literacy) *see ACGME definition of direct supervision in the Program Requirements	Communicates complex and difficult information, such as errors, complications, adverse events, and bad news	Serves as a role model for effective and compassionate communication Develops patient-centered educational materials
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- 360 Evaluation/Multi-rater/Peer
- Simulation/OSCE
- Direct observation and feedback
- Self-Assessment and Reflections/Portfolio

Interpersonal and Communication Skills

ICS2: Effective communication with members of the health care team					
Has not Achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Adheres to transfer-of-care policies **Written/Electronic:** Generates accurate reports with appropriate elements required for coding **Verbal:** Communicates urgent and unexpected findings according to institutional policy and ACR guidelines	**Written/Electronic:** Efficiently generates clear and concise reports that do not require substantive faculty member correction on routine cases **Verbal:** Communicates findings and recommendations clearly and concisely	**Written/Electronic:** Efficiently generates clear and concise reports that do not require substantive faculty member correction on common complex cases **Verbal:** Communicates appropriately under stressful situations	**Written/Electronic:** Efficiently generates clear and concise reports that do not require substantive faculty member correction on all cases **Verbal:** Communicates effectively and professionally in all circumstances	Leads interdisciplinary conferences **Written/Electronic:** Generates tailored reports meeting needs of referring physician Develops templates and report formats **Verbal:** Serves as a role model for effective communication
☐	☐	☐	☐	☐	☐
Comments:					

Possible Methods of Assessment/Examples:

- End-of-Rotation Global Assessment
- 360 Evaluation/Multi-rater/Peer
- Simulation/OSCE (Intradepartmental and Team)
- Direct observation and feedback
- Self-Assessment and Reflections/Portfolio