The Pathology Milestones and the Next Accreditation System

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- **Context.**—In the late 1990s, the Accreditation Council for Graduate Medical Education developed the Outcomes Project and the 6 general competencies with the intent to improve the outcome of graduate medical education in the United States. The competencies were used as the basis for developing learning goals and objectives and tools to evaluate residents’ performance. By the mid-2000s the stakeholders in resident education and the general public felt that the Outcomes Project had fallen short of expectations.

- **Objective.**—To develop a new evaluation method to track trainee progress throughout residency using benchmarks called milestones. A change in leadership at the Accreditation Council for Graduate Medical Education brought a new vision for the accreditation of training programs and a radically different approach to the evaluation of residents.

- **Data Sources.**—The Pathology Milestones Working Group reviewed examples of developing milestones in other specialties, the literature, and the Accreditation Council for Graduate Medical Education program requirements for pathology to develop pathology milestones. The pathology milestones are a set of objective descriptors for measuring progress in the development of competency in patient care, procedural skill sets, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.

- **Conclusions.**—The milestones provide a national standard for evaluation that will be used for the assessment of all residents in Accreditation Council for Graduate Medical Education–accredited pathology training programs.


The Liaison Committee for Graduate Medical Education was established in 1972 as a forerunner of the Accreditation Council for Graduate Medical Education (ACGME). Established in 1981, the ACGME is a nonprofit council that evaluates and accredits medical residency training programs in the United States. In the late 1990s, David Leach, MD, former CEO of the ACGME, suggested that the accreditation of residency programs should focus on the outcome of residency training. This effort to overhaul resident education and the evaluation process involved educators, program directors, faculty members, residents, and representatives of the general public. In this process, they reviewed 2500 articles from the literature.1 They were asked to identify areas in which physicians should have competency at completion of residency training. The initial list included 84 “competencies.” This was eventually condensed to a core of 6 competencies, which became known as the ACGME 6 general competencies: patient care, medical knowledge, practice based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.1 Beginning in the late...
1990s, pathology residency training programs and most subspecialty fellowship training programs were required by the ACGME to develop robust year-specific learning goals and objectives and performance evaluation tools that incorporated the 6 general competencies. Graduate medical education (GME) training programs in all specialties developed and implemented competency-based goals and objectives as well as competency-based evaluation tools. In the mid-2000s, however, the Institute of Medicine; the Medicare Payment Advisory Commission; and public interest groups, notably Public Citizen, raised concerns that the ACGME Outcomes Project had lost momentum, and confidence that the Outcomes Project was successful in producing competent practitioners had eroded. These groups charged that existing evaluation methods were inadequate for ensuring attainment of competency. Pressure to have the Occupational Safety and Health Administration or Congress take oversight of GME provided further impetus to change the method of assessing residents, with the goal of more uniform training outcomes across the nation.\(^2\) Thomas J. Nasca, MD, the current CEO of the ACGME, designed and is implementing the ACGME Next Accreditation System (NAS) and the Milestones Project in response.\(^3\)

**COMMENT**

**The Old Accreditation System**

The previous accreditation system has been used for many years, and focused primarily on process, that is, compliance with numerous program requirements. Program directors spent several weeks to months preparing a program information form (PIF), which could exceed 100 pages for a core anatomic and clinical pathology residency training program. The PIF contained questions that required extensive and intimate knowledge of the operations of the program, the institution, and affiliate institutions (if any), and included the curriculum vitae of every faculty member. An ACGME field surveyor reviewed the PIF about 2 weeks prior to the site visit and prepared numerous detailed questions based upon review of the PIF and previous program citations. The site visit included interviews with the program director and program coordinator, the designated institutional official (DIO), the department chair, the faculty, and the residents, in that order. If necessary or indicated, the field surveyor toured the facility. The field surveyor wrote a report based on information contained within the PIF and the interviews. Two members of the ACGME Review Committee (RC) for Pathology were assigned to review the field surveyor’s report and the PIF, and the reviewers’ findings were discussed at 1 of the 2 semiannual RC for Pathology meetings. The RC for Pathology decided the accreditation status of the program and the cycle length. Generally, a program with no significant problems, no duty hour violations, and a good first-time board pass rate was assigned a 5-year accreditation cycle. The RCs did not have tools to address programs that had significant issues, other than to cite areas of noncompliance with program requirements, shorten the cycle length (1–2 years), and request a progress report, which was reviewed at a subsequent RC meeting. Thus, in the previous accreditation system, the RCs did not have effective ongoing oversight of residency training. Dr Nasca has drawn the analogy that the previous accreditation system was much like taking a biopsy every 4 to 5 years and making assumptions that the biopsy “... represents the longitudinal experience of the program ... [and] predicts the future performance of the program ...”\(^4\)

In reality, programs are dynamic institutions that experience ongoing changes that can have a significant impact, positive or negative, on the training program. Every year, a new class of trainees with diverse educational backgrounds joins each program, both at the postgraduate year (PGY) 1 level and at the fellowship level. Faculty members, including program directors and chairs, leave institutions, and new faculty members are hired.

In the previous accreditation system, the residency program would undergo an internal review arranged by the sponsoring institution’s (SI’s) Graduate Medical Education Committee (GMEC) at the midpoint of its accreditation cycle. The Internal RC typically included a program director, a faculty member, a house officer from another residency program in a different department, the DIO or designated institutional GME representative, and a representative from the hospital administration. The program also was required by the ACGME to undergo an annual program review, which included reviewing program outcomes such as first-time board pass rates, faculty development, and faculty and resident evaluations of the program. The findings from the Internal RC and the annual program review were not made available to the ACGME field surveyor or the RC.

**The NAS**

The NAS will begin on July 1, 2013, for phase I specialties, which include diagnostic radiology, emergency medicine, internal medicine, neurological surgery, orthopedic surgery, pediatrics, and urology and their subspecialties. The NAS has been predicted to reduce the amount of work necessary to maintain accreditation of residency programs, and will allow programs in good standing to innovate. The NAS should assist programs in need of improvement. The NAS should also help to build upon and achieve the promise of the Outcomes Project. As GME is financed through taxpayer dollars, the NAS will also provide public accountability for the outcome of GME.\(^4\) In the spring of 2013, residency and fellowship training programs in phase II of the NAS, which includes pathology, were assigned revised NAS site visit dates. Their implementation of the milestones will be July 1, 2014. In the NAS, there will be fewer administrative demands placed upon the program director and program coordinator, and site visits will occur at longer intervals. Programs that currently have 3- to 5-year accreditation cycles will be assigned a 10-year interval between site visits. The site visit in the NAS will be of a self-study nature, using a methodology that may be similar to the self-study method that is used by the Liaison Committee for Medical Education in Liaison Committee for Medical Education–accredited United States medical schools. The site visits in the NAS for a core anatomic and clinical pathology residency program will concomitantly include all pathology fellowship training programs for that institution. The self-study site visit may also include “tracer”– style follow-through of a patient, similar to the methodology used by the Joint Commission.\(^5\) The PIF part 2 will not be required in the NAS; however, the program annually will update their information online through the ACGME Web Accreditation Data System. In July 2011, the ACGME Web Accreditation Data System was updated to include additional questions to provide the necessary information for annual program updates for the NAS. Faculty members’ curricula vitae will not be included.

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in preparation for the site visit; only the program director’s curriculum vitae will be required. Faculty development (publications, grants, and presentations of core faculty members) will also be uploaded and monitored annually. Site visits in the NAS will include 2 ACGME field surveyors. In programs spanning multiple years, such as Pathology, the PGY1 and PGY2 classes will be interviewed by one field surveyor, and the PGY3 and PGY4 classes will be interviewed by the other field surveyor in a separate room to avoid actual or perceived bias from the senior residents. The site visit will occur as an “inverted” site visit. The field surveyor will meet with the program director and program coordinator as before, followed by the residents. Equipped with the knowledge and information from the resident interview, the ACGME online resident and faculty surveys, and resident case logs, the field surveyor will ask focused questions of the DIO, chair, and faculty members. There will be an exit interview between the field surveyors and the program director and program coordinator (L. M. Opas, MD, oral communication, October 24, 2012).

Annual ACGME online resident surveys have been in existence for several years, although the content of the survey has changed from year to year. The content of the survey is inaccessible by the DIO, program directors, and faculty until after the results have been aggregated by the ACGME and posted online. In the fall of 2012, the ACGME began online surveys of core faculty members in the phase I specialties. Both the resident and faculty online survey results will be reviewed by the field surveyors and the RCs, and will serve as a basis for focused questions during the 10-year site visit. Noncompliant surveys that are greater than 2 standard deviations from the national mean may result in a focused site visit prior to the scheduled 10-year site visit. The purpose of the focused site visit is to improve both the quality of residency training outcomes and patient safety. In the NAS, internal reviews will no longer be required.

Phase II programs will transition to the NAS on July 1, 2013. During the 2013–2014 academic year, programs with 3- to 5-year accreditation cycles will not have site visits, in preparation for the transition to the NAS and implementation of the milestones. Programs with shorter cycles, and programs with initial accreditation, will continue under the old system with the possibility of site visits. Applications for new programs will continue with the preparation of an initial accreditation PIF and an initial site visit.

The Clinical Learning Environment Review Visit

The initial plans for the Clinical Learning Environment Review (CLER) visit are summarized below; however, it is anticipated that the procedures for the CLER visit will be modified as the ACGME gains experience with this new approach. Although the administrative responsibilities for program directors and program coordinators are expected to decrease in the NAS, there is an anticipated heightened accountability and responsibility for GME placed on the SI. The SI will have a CLER site visit every 18 months. The Institute of Medicine originally wanted the CLER site visits to occur annually; however, this was a logistical impossibility given the number of SIs and available resources. The CLER Evaluation Committee is cochaired by Kevin Weiss, MD, MPH, and James Bagian, MD, PE, and the committee includes specialists who are experts in quality assurance and patient safety. The CLER site visits will initially include ACGME site visitors as well as volunteers who include deans, DIOs, and physicians. The SI will have 10 to 14 days’ advance notice prior to the site visit. CLER site visits may take 1 day for smaller institutions, but for larger institutions with multiple residency and fellowship programs and several hundred house officers, the CLER site visits may take 2 to 3 days to complete. The CLER site visit team will focus on 6 issues: patient safety, quality improvement, transition of care, supervision, duty hours/fatigue management/mitigation, and professionalism. The SI must demonstrate to the CLER site visit team the provisions it has in place to support GME by addressing 5 substantive questions: (1) What organizational structures, administrative, and clinical processes does the SI have in place to support GME learning in the above 6 areas? (2) What is the role of GME leadership and the faculty to support learning in the above 6 areas? (3) How engaged are the residents and fellows in using the SI’s current Clinical Learning Environment infrastructure? (4) How does the SI determine the success of its efforts to integrate GME into the quality infrastructure? (5) What areas has the SI identified as opportunities for improvement? The CLER site visit team will first meet with the DIO, the chair of the institutional GMEC (if not the same person), and the “C suite” (CEO, chief medical officer, and chief nursing officer). The team will meet with the institution’s quality improvement officer and patient safety officer. Residents will escort the CLER site visit team on a walk-around using “tracer” methods. The CLER team will meet with a peer-elected house officer from each department at the institution. This is followed by another walk-around. The CLER site visit team will meet with faculty members from all departments, followed by another walk-around. The CLER team meets with all of the program directors, and the team will convene a meeting and draft an initial report. The initial draft report is discussed with the DIO, the chair of the institutional GMEC, the CEO, the chief medical officer, and the chief nursing officer in an exit interview. The CLER Evaluation Committee reviews the final report. As part of the CLER process, the SI must demonstrate support for faculty and leadership development in the 6 areas described above.

The CLER site visits were alpha tested in July 2012 to validate the process, and beta testing began in September 2012. During beta testing of the CLER site visits, the final report was made anonymous. That is, the institution’s name was removed from the report prior to submission to the CLER Evaluation Committee. The purpose of making the report anonymous was to compile information and interpret the data gathered through the CLER process. During the next phase of implementation, the subsequent CLER site visits will gather a baseline for future CLER site visits for a given institution. Eventually, CLER site visit reports will count toward institutional accreditation.

There are 385 SIs with multiple training programs. Initially, the CLER site visit teams will not visit single-program SIs. Eventually, when CLER site visits affect single-program SIs, this will impact pathology, which has 21 forensic pathology fellowship programs and 4 transfusion medicine/blood banking fellowship programs that are the sole training program at their institution. In addition to the 10-year site visit, these single-program SIs will also be subject to CLER site visits every 18 months. These programs will have the option of administrative affiliation with an SI with multiple training programs to avoid the additional CLER site visits. After July 1, 2013, applications from single-program SIs will be required to have affiliation with a...
The Pathology Milestones

At the July 2011 Association of Pathology Chairs’ Program Directors’ Section (APC/PRODS) meeting, Dr. Thomas Nasca presented the NAS to chairs and program directors, and cited a JAMA article that studied the patient outcomes of 9 measures of maternal complications from childbirth to evaluate obstetric residency training programs by studying all obstetric hospital discharges in Florida and New York. The findings of the study demonstrated up to nearly one-third higher frequency in the complications related to childbirth between graduates of different programs, which closely paralleled the complication rates of these practitioners’ original training programs. This article underscored the public’s expectation of uniform competency among practitioners. That is, a patient seeking care by an obstetrician-gynecologist who graduated from one program expects the physician to have the same level of competency as a graduate from any other similarly accredited program. As residents progress from undergraduate medical education through GME to unsupervised practice in the community or at an academic institution, they begin with closely supervised patient care activities; however, trainees are expected to take on progressively more responsibility and to be allowed to make decisions on patient care with indirect supervision. A resident close to the end of training may be advanced to oversight supervision, where he or she is allowed to make patient care decisions that are later reviewed by the supervising faculty member. How does the supervising faculty member or program director decide to graduate a resident’s responsibilities? What patient care, medical knowledge, procedural skill sets, and other competencies should be achieved by the end of residency for the program director to sign off that the resident has “demonstrated sufficient competence to enter practice without direct supervision”? The pathology milestones provide a “30,000-foot view” to guide pathology residents in which patient care skills, procedural skill sets, medical knowledge, attitudes, and professionalism they are expected to acquire by the end of residency training. Similarly, the milestones provide pathology faculty members and program directors guidelines on what knowledge and skills the residents must gain by way of competence throughout residency training. Steven P. Nestler, PhD, consultant to the ACGME on the Milestones Project, selected representatives from the ACGME, the RC for Pathology, and the American Board of Pathology (ABP); pathology program directors and a chair; and a pathology resident and fellow. The Pathology Milestones Working Group (PMWG) includes C. Bruce Alexander, MD (vice-chair, PMWG; program director); Betsy D. Bennett, MD, PhD (ABP; she stepped off the working group upon her retirement from the ABP); W. Stephen Black-Schaffer, MD (program director); Mark Brissette, MD (past member, RC for Pathology); Margaret M. Grimes, MD (former program director; ABP trustee); Robert D. Hoffman, MD, PhD (program director); Jennifer Hunt, MD, PhD (department of pathology chair); Julia Iezzoni, MD (chair, RC for Pathology); Rebecca Johnson, MD (ABP CEO); Jessica Kozel, MD (fellow); Ricardo Mendoza, MD (resident); Wesley Y. Nariotoku, MD, PhD (chair, PMWG; vice-chair, RC for Pathology); Steven P. Nestler, PhD (ACGME); Miriam D. Post, MD (past resident member, RC for Pathology); Suzanne Z. Powell, MD (immediate past chair, RC for Pathology); Gary W. Procop, MD (member, RC for Pathology; ABP trustee); Jacob J. Steinberg, MD (program director); and Linda Thorsen, MS (executive director, RC for Pathology).

The PMWG was charged with the development of milestones in the patient care and medical knowledge competency areas; by consensus, the group opted to limit the total number of milestones to between 25 and 35. The PMWG began in May 2011 with a conference call that discussed the vision and early methodology, including solicitation of ideas and concerns from pathology residency program directors on the PRODS Listserv. Although the feedback from the Listserv was limited, the suggestions from program directors on what to include in the milestones and their concerns were collected and presented at the 2011 APC/PRODS meeting. At that meeting, Dr. Nestler outlined the plan and timeline for the pathology milestones. Dr. Andrew Lee, chair of the Ophthalmology Milestones Working Group, and Dr. Michael Coburn, chair of the Urology Milestones Working Group, presented their experience from their respective working groups of valuable lessons learned from phase 1 specialties. The program directors had a breakout session in 3 groups: anatomic pathology cognitive, anatomic pathology procedural, and clinical pathology cognitive and procedural, and added to the suggestions from the PRODS Listserv. Input from the breakout groups and the PRODS Listserv were discussed at the first PMWG meeting, October 27–28, 2011. A prototype of the pathology milestones was provided to the PMWG, and by the conclusion of the first meeting, blueprints for the pathology milestones had been constructed that incorporated most of the input from the PRODS Listserv and 2011 APC/PRODS meeting breakout sessions. Between that first meeting and the second PMWG meeting on January 7–8, 2012, members of the PMWG were asked to review the initial document and look for areas of improvement and refinement. An initial report to PRODS was presented at the spring PRODS meeting in Vancouver in March 2012, where program directors again provided their feedback and concerns. The comments from the 2012 spring PRODS meeting were used to further modify the milestones at the third PMWG meeting on April 15, 2012. The revised milestones were presented at the ABP Cooperating Societies meeting, where small-group discussions took place and many of the societies provided their input. As a result of this meeting, ACLPS volunteered to convene a subcommittee with the intent of fleshing out further examples of clinical pathology milestones. In May 2012, the revised pathology milestones were distributed on the PRODS Listserv and program directors were asked to provide constructive criticism via an online survey, which was presented at the 2012 APC/PRODS meeting. The comments from the online survey and the 2012 APC/PRODS meeting were reviewed by the PMWG prior to their fourth meeting on October 6, 2012. The final draft of the pathology milestones was developed with 29 milestones for anatomic and clinical pathology programs, 28 milestones for Anatomic Pathology 3 (AP3) or Anatomic Pathology/Neuropathology 4 (AP/ NP4) programs, and 23 milestones for Clinical Pathology 3 (CP3) programs. In addition, a user’s guide with frequently asked questions was developed for alpha and beta test sites. The milestones use a 5-anchored evaluation system, which is similar to the Dreyfus brothers’ model for competency. Level 1 describes a beginning resident, who functions as an...
observer and junior member of a dyad; this resident requires direct supervision in all patient care decisions. Level 2 describes a resident in the early phase of residency, who is a cognitive early idea generator and works as a co-member of a dyad; he or she may function with direct supervision or with indirect supervision when direct supervision is immediately available. A level 3 resident is in the midphase of training, is a cognitive refiner of ideas, and is progressing toward becoming a competent practitioner. Level 5 describes a junior member of a broader health care team that functions with indirect supervision, or with oversight supervision by faculty, as appropriate. The level 4 resident is in the late phase or at the end of residency, and is a cognitive generator of final answers and a competent practitioner. These residents function as integral members of the clinical care team and can provide direct and indirect supervision for more junior residents. They are capable of making patient care decisions with oversight supervision. Level 5 represents a cognitively and technically proficient provider of services who is in the early phases of independent practice and would typically be 2 or more years out of residency training. Maintenance of certification, ongoing professional practice evaluation, focused professional practice evaluation, continuing medical education, and credentialing by hospitals will provide assessments of the level 5 practitioner. These educational milestones are developmentally rather than temporally based, and comprise specialty-specific achievements that residents are expected to demonstrate sequentially as they progress through training. Their purpose is to create a logical trajectory of professional development through essential elements of competency, and to define criteria for effective assessment. It is recognized that in many instances, particularly for rotations that occur only once during residency, a resident may not have initiated training in a given milestone. If this is the case, “not applicable” would be appropriate, regardless of the year of training. In addition, programs organize training in different ways. For example, in a program that has 2 years of anatomic pathology, followed by 2 years of clinical pathology, residents would strive to achieve level 4 in anatomic pathology–related milestones by the end of their second year, and their clinical pathology–related milestones would be reported as not applicable.

The methods that are used to evaluate residents on their milestones are familiar to program directors, and include direct observation, case logs, portfolios, 360 evaluations, in-training examinations, and other evaluation tools. For example, residents are evaluated by direct observation by the attending staff pathologist. Professionalism can be assessed by 360 evaluations including the surgical team. Diagnostic acumen can be assessed in real time at case sign-out, or through retrospective peer review of the resident’s portfolio of cases. Residents may refer to the pathology milestones to understand the different levels of performance for a given procedural or cognitive milestone they are expected to achieve as they progress through residency. Faculty members, program directors, and the Clinical Competency Committee (CCC) discussed below) have a national standard provided by the milestones to evaluate performance of residents as they progress through residency. The pathology milestones provide a reference point for faculty members, program directors, and the CCC to ensure that all residents are competent practitioners by the conclusion of residency. Residents who do not achieve specific milestones by the expected point in training will be counseled, receive focused training, and be allowed to remediate. Finally, the pathology milestones provide accountability to the public and serve to give the public an overview of what a pathologist does. Residents self-evaluate their progress in the milestones, and the CCC reviews the residents on each milestone, using the appropriate evaluation tools.

Example Pathology Milestone

Consider the cognitive and procedural skills that a pathology resident must acquire to competently perform an intraoperative consultation/frozen section, from receipt of the specimen to reporting the result. This is certainly a procedure that one would not allow a level 1 resident to do on his or her first day of residency. However, undergraduate medical education should have provided medical students with familiarity with surgical procedures that would require intraoperative consultation/frozen section, as well as what types of specimen the various surgical procedures may produce. Undergraduate medical education experience may have also provided students with experience with the typical questions the surgeon may pose to the pathologist during an intraoperative consultation, such as status of a margin, depth of tumor invasion, or adequacy of the specimen. Novice pathology residents should also be familiar with the role of the pathologist in the intraoperative consultation, and how the result of the frozen section contributes to the management of the patient. The novice resident requires direct supervision to participate in frozen sections, and functions as a junior member of a dyad who begins in a purely observational role. Through observation, the resident learns that accuracy of the frozen section diagnosis depends upon knowing how to select tissue for the frozen section and how to prepare a frozen section of good quality. The resident comes to understand that there are contraindications to frozen sections, and learns the proper technique of calling back the results to the operating room. The resident who has achieved consistency in these skills is rated as a level 2 resident for this milestone. With greater experience and consistency in level 2 skills, the resident can function with indirect supervision and can prepare and review the frozen section to develop his or her own provisional differential diagnosis. The resident develops cognitive skills to appropriately discuss the pathologic findings with the supervising pathologist, the first steps toward developing diagnostic skills on frozen sections, which are different from diagnosing permanent sections. The resident can consistently select the correct tissue to sample for the frozen section, can reliably produce slides of good quality, and can do so within the accepted turnaround time. Under supervision, the resident acquires the skills to call the diagnosis back to the operating room, and understands the impact the diagnosis has on the surgical algorithm, even in situations that are ambiguous. The resident who consistently performs at this level is rated as a level 3 resident, and typically would achieve this level midway through anatomic pathology training. By the end of residency, the resident should be able to advise the surgeon about frozen section requests that are inappropriate or contraindicated, and to handle the situation with professionalism, including appropriate responses to the surgeon’s concerns. The resident knows how to ask appropriate questions of the surgeon that may influence the wording of the frozen section diagnosis. The senior resident who has consistently demonstrated these skills is rated as a level 4 resident. The aspirational
The goal of the pathologist a few years after completing residency is to be proficient in the performance of the intraoperative consultation/frozen section in all settings. He or she can manage competing tasks, such as multiple frozen sections, being able to prioritize properly while being mindful of the turnaround time; this describes a level 5 pathologist.

Clinical Competency Committee

Each residency and fellowship training program must form its own CCC. The CCC consists of faculty members, including board-certified pathologists, and may include non-MD faculty members, such as PhDs. The CCC may be at least 3 to 5 faculty members in size and should cover the broad disciplines in the department. The CCC is required to meet at least on a semiannual basis to review each resident using all possible evaluation tools, and to assign the appropriate milestone level achieved for all of the 29 milestones applicable to each resident’s program. The CCC serves in an advisory role to the program director. Based upon the advice of the CCC, the program director assigns milestone levels for each applicable milestone to every resident, and these are then uploaded to the ACGME website, probably through the Web Accreditation Data System. This information is considered confidential and protected. To view the final pathology milestones as it existed when published on the ACGME website in September 2013, go to http://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/PathologyMilestones.pdf.

Alpha Testing the Milestones

From November 2012 to January 2013, 4 programs alpha tested the pathology milestones: Los Angeles County + University of Southern California Medical Center (Los Angeles, California), Massachusetts General Hospital (Boston, Massachusetts), The Methodist Hospital (Houston, Texas), and Vanderbilt University Medical Center (Nashville, Tennessee). These programs were selected as alpha test sites to validate the milestone concept based upon their program directors being members of the PMWG. At all 4 alpha test sites, presentations on the NAS and pathology milestones were provided to faculty and house officers. A self-evaluation tool was developed, which combined the pathology milestones with a self-evaluation tool developed by L.J. Fowler, MD. This self-evaluation form was electronically distributed by e-mail to the alpha test site programs, and residents were given time to self-evaluate. The residents were provided with the definition of each of the 29 pathology milestones and the milestone level criteria. The methodologies at the 4 alpha test sites were diverse and distinctive, as general guidelines were given to the alpha test sites but specific procedures were not provided. At Los Angeles County + University of Southern California Medical Center, the residents were reviewed 1 resident at a time, looking at all 29 milestones and starting with PGY4s, who had begun or completed most of the milestones. As with any unfamiliar process, the first resident’s review took the longest to complete (22 minutes). As the CCC members became familiar with the process and definitions, it became easier to complete future reviews in a shorter time.

Figure 1. Example graphic representation of milestones self-assessment by residents. After instruction in the use of the milestones, residents provided a self-assessment for each milestone using the standard scale from level 1 (novice) to level 5 (proficient) as described in the text. Residents also were permitted to provide nonnumeric self-assessments, “not applicable,” shown as N, or “discontinuity in program,” shown as D, if training had not commenced because of either program track or program structure, respectively. Numeric scores are color coded from red for scores of level 1, through yellow for scores of level 3, to green for scores of level 5, with corresponding intermediate shades for intervening levels. Abbreviations: AP, anatomic pathology; CP, clinical pathology; FNA, fine-needle aspiration; PGY, postgraduate year.
easier to complete the evaluations. The CCC reviewed the residents’ self-evaluation, reviewed their other forms of evaluation, and assigned milestone levels for each resident. As the PGY1 residents had started fewer milestones, assignment of their milestone levels took far less time. Vanderbilt University took a totally different approach, evaluating 1 PGY level per meeting, and evaluating all residents for 1 milestone at a time. This allowed for faster familiarization with the milestones, and likely resulted in more consistent rating within a PGY level for a given milestone. Further, the CCC at Vanderbilt University chose to assign the milestone level blinded to the self-evaluation of the resident. The Methodist Hospital did their assessment in yet a different method, with the members of their CCC reviewing and assigning milestone levels prior to the first meeting. This alpha site program had only 3 CCC meetings, as opposed to the other 3 programs, which had 4 CCC meetings. All 4 alpha test site programs reported that with the current milestones, many residents would not achieve level 4 in some milestones by the end of residency training. Massachusetts General Hospital recommended that evaluation tools or “skill cards” be designed for each rotation to align with the milestones. With national standards for pathology milestones, Massachusetts General Hospital also stated that it should be easier to add new programmatic elements to the training program. Residents and faculty at Massachusetts General Hospital also reviewed the milestones in detail and suggested further edits in the wording, including collapsing the one professionalism milestone that did not progress from level 2 through level 4 into another professionalism milestone with modification of that milestone’s wording. It was a common observation that many residents rated themselves lower than the CCC-assigned level. Because the alpha programs agreed to follow a process wherein the milestones would be addressed both as a resident self-assessment and as an assessment by the CCC, useful data were derived by visualizing the difference between the self-assessment and the CCC assessment. A graphic method using color coding of the data was developed, similar to the heat map often used in molecular genetics to display trends in array data. Comparing the resident self-assessments from one program with the corresponding CCC assessment shows 2 useful facts: first, there is a clear progression during training for most of the milestones; and second, there is a general concordance between the independently conducted assessments, providing a measure of validation for the method. Furthermore, applying a similar color coding to the difference between the self-assessment and the CCC assessment highlights that there is more often a tendency of the resident to systematically slightly overassess or underassess than there is for a systematic difference to occur for particular milestones (Figures 1 through 3). Similar results were reported by other alpha sites (data not shown). The number

Figure 2. Example graphic representation of milestones assessment by Clinical Competency Committee (CCC). After instruction in the use of the milestones, the CCC assessed each resident using the standard scale from level 1 (novice) to level 5 (proficient) as described in the text. The CCC assessments were blind to the resident self-assessments. The CCC was also permitted to provide nonnumeric assessments, “not applicable,” shown as N, or “discontinuity in program,” shown as D, if training had not commenced because of either program track or program structure, respectively. Numeric scores are color coded from red for scores of level 1, through yellow for scores of level 3, to green for scores of level 5, with corresponding intermediate shades for intervening levels. Abbreviations: AP, anatomic pathology; CP, clinical pathology; FNA, fine-needle aspiration; PGY, postgraduate year.
of meetings, average time required to evaluate a resident on all 29 milestones, and number of residents in the program for the alpha test sites are listed in the Table. In April and May 2013, 12 additional programs that have volunteered to beta test the pathology milestones will begin evaluating their residents. The program directors from the beta test site programs will discuss their pathology milestone experience in a panel discussion at the 2013 APC/PRODS meeting in Boston, Massachusetts.

### Pathology Subspecialty Fellowship Milestones

Additional experts in each of the pathology subspecialty fellowship areas will be recruited to develop pathology subspecialty fellowship milestones; however, at least 1 member of the original PMWG will be included to serve as the chair of each of the fellowship working groups. Pathology subspecialty milestones working groups tentatively will meet in spring of 2014, during which the groups will communicate by e-mail and conference calls. The final pathology subspecialty milestones working group meeting tentatively is planned for summer or fall of 2014, with the deadline for pathology subspecialty milestones in December 2014.

### CONCLUSIONS

The pathology milestones were developed to provide uniform nationwide training goals for pathology residents. They also serve as benchmarks for appropriate and expected achievements of procedural and cognitive skills throughout the residency training program, against which faculty members and program directors will evaluate the progress of residents. Pathology milestones provide an outcome measure that will be reported on a semiannual basis to the ACGME, and will eventually serve as one of several tools to measure the efficacy of any given program in training pathology residents. Finally, the pathology milestones are a public document that provides the public with a "30,000-foot view" of what it is that pathologists do within the greater health care system.

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### ADDENDUM

Dr. Naritoku, the corresponding author, would like to note that when the Pathology Milestones were published in September 2013, there were 27 milestones for anatomic and...
clinical pathology programs, 26 milestones for Anatomic Pathology (APS) programs, and 22 milestones for Clinical Pathology 3 (CP3) programs

References

1. Leach D. The competency model: is there life after competence? Presented at Association of Pathology Chairs’ Program Directors’ Section meeting; July 24, 2001; Park City, UT.
4. Nasca TJ. ACGME: milestones, the next step in outcomes evaluation and program accreditation. Presented at Association of Pathology Chairs’ Program Directors’ Section meeting; July 13, 2011; Monterey, California.