Resident Preparation for Practice

A White Paper From the College of American Pathologists and Association of Pathology Chairs

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EXECUTIVE SUMMARY

Pathology’s future depends on training pathologists who are as facile with new technologies as they are with the microscope. Trainees must absorb, assimilate, and be ready to apply an unprecedented breadth of scientific and technologic knowledge and concepts and apply these skills as part of the patient treatment team. During the past decade, several pathology surveys have identified gaps in resident preparation for practice. The identified gaps typically involve a minority of trainees and may be more evident in certain practice settings, such as high-volume general practice. However, as pathology practice continues to evolve, these gaps are becoming more evident and problematic. Action is needed now because the process of training a new pathologist spans 4 to 6 years (anatomic pathology [AP], clinical pathology [CP], or more commonly AP/CP, plus 1 or 2 fellowships) or 10 years if medical school education is included.

Currently, gaps exist for some residents in the preresidency mastery of basic histology, anatomy and pathology, the ability to make relevant clinical decisions, life-long learning habits, interpersonal and communication skills, professionalism, ability to recognize limitations, readiness to practice independently, gross pathology skills, ability to handle high-volume surgical pathology, ability to provide competent CP consultation, and preparation in laboratory medical direction and management. Most trainees elect a fellowship, suggesting that current residency training is not adequate to prepare them for immediate practice. In its current form, the American Board of Pathology (ABP) examination is not designed as a comprehensive measure of competence and may contribute to the gaps by misdirecting the focus of residency training.

Academic and private practice pathologists must be cooperatively engaged in building the bridge that connects our current path to our future road. As the largest professional organization of pathologists and the organization of chairs of academic departments overseeing training programs, the College of American Pathologists (CAP) and Association of Pathology Chairs (APC) must take a lead in addressing these issues.

The CAP Board of Governors and APC Council (oral and written communication to Michael L. Talbert, MD [CAP Graduate Medical Education chair] from J. Charles Jennette, MD [APC president] on behalf of the APC Council, April 2009) recommend the following actions:

1. Share this joint position with internal and external groups, propose solutions, and obtain support for proposed solutions. Within the next 6 months, begin a series of forums to build consensus around the need to enhance resident preparation for practice, involving, for example, CAP Residents Forum, CAP councils, APC/Program Directors Section of APC, Accreditation Council for Graduate Medical Education (ACGME)/Residency Review Committee of the ACGME, ABP, and other cooperating societies.
2. Fund projects to develop and implement a comprehensive set of residency learning objectives based on the 6 general competencies of the ACGME that address the future of the specialty and further define the knowledge, skills, and attitudes needed to perform successfully in practice.
3. Develop strategies and mechanisms for providing sufficient graduated responsibility across all aspects of residency training that simulates the practice experience.
4. Develop tools to teach and assess the skills necessary for practice (eg, pathology practice-specific simulations, such as computer-assisted simulations).
5. Strengthen medical school pathology instruction (eg, anatomy, microanatomy, pathophysiology) so that medical
school graduates are prepared to begin pathology residency training and other clinical specialists have sufficient understanding of pathologic processes to appropriately use pathology and laboratory services for the provision of patient care.

**BACKGROUND**

In the rapidly changing health care environment, physician education must encompass a broader spectrum of skills and knowledge than in the past. The changes occurring are affected by society’s emphasis on maintaining work-life balance (eg, requirements for fewer duty hours), changing attitudes of trainees about occupation versus profession, and the ever-changing milieu of federal regulations and provider payment. The expectations of employers and physician “employees” are also changing. In addition to fulfilling traditional roles as diagnosticians, pathologists must strive to meet marketplace demands to provide consultation to patients and their families and to other physicians.

The practice of pathology is being shaped by rapid technological and scientific progress, as well as market forces. Pathologists must increase their role as consultants to remain part of the clinical care team. Skills that made a pathologist successful yesterday will not be sufficient to guarantee success tomorrow. If resident education fails to evolve, trainees will be especially impacted. Recent research and anecdotal evidence suggest that many trainees may not be prepared for practice upon completion of training. Although not a universal phenomenon and strongly affected by the practice situation, these gaps in preparation will widen as changes within the profession accelerate.

For the most part, closing the gaps is the responsibility of medical school and graduate medical education training program faculty. The purpose of this article is to identify some of the perceived areas for improvement and to suggest possible mechanisms to close some of these gaps.

In 2004, the CAP hosted the Future of Pathology Task Force, bringing together representatives of several key pathology organizations (including CAP, the American Board of Pathology, The American Pathology Foundation, the American Society of Clinical Pathology, the American Society of Cytopathology, the Association for Molecular Pathology, the Association of Directors of Anatomic and Surgical Pathology, the Association of Pathology Chairs, the National Association of Medical Examiners, and the United States and Canadian Academy of Pathology) to discuss and explore the future of pathology. Through these discussions, the task force recognized that resident and fellow education and preparation for practice were crucial to the future of pathology. To study this issue, a survey was conducted in May 2005 of potential employers (heads of groups, members of the Association of Directors of Anatomic and Surgical Pathology, and experienced CAP fellows) with the goal of assessing readiness for practice across a broad range of skills and practice environments. Similar information on readiness for practice was also solicited from recent graduates of pathology training programs. Results of these surveys are described in detail in the *Archives of Pathology & Laboratory Medicine.* In brief, 722 CAP members identified as heads of groups, 182 Association of Directors of Anatomic and Surgical Pathology members, and 2967 CAP fellows who passed their boards between 1980 and 1994 (but were not included in the other 2 groups) were sent an e-mail link to the survey. Inviteres were asked to indicate if they were responsible for hiring or supervising recent graduates. Twelve percent of the heads of groups, 21% of Association of Directors of Anatomic and Surgical Pathology members, and 9% of the experienced CAP fellows (a total of 384 respondents) completed the survey. Thirty-one percent were from academic practices, while the remaining survey respondents were from nonacademic settings. Overall, 11% of respondents who had hired recently trained pathologists reported being dissatisfied and 3% very dissatisfied with the newly trained pathologists. Thirty-three percent reported that their current hire was somewhat prepared or only slightly prepared to enter practice. One half of respondents reported that more or much more guidance and support was necessary for the new hire as compared with 10 years ago. Thirty-one percent reported the new hire had major deficiencies in critical areas, with the most common being in the skills of management, surgical pathology, and interpersonal interactions. In general, nonacademic respondents reported less readiness for practice among new hires compared with academic respondents. Areas of least preparation were regulatory and compliance issues, clinical laboratory management, laboratory personnel management, grant application preparation, and billing and reimbursement issues.

The May 2005 survey of recent graduates targeted 732 CAP junior members who finished in January 2004 or later and 200 CAP junior members who completed their boards in 2003. These individuals were sent e-mails containing a link to the survey. In addition, 134 residency program directors were asked to forward the survey link to each of their former residents. There were 247 responses from pathologists who secured a position in 2005 or later. Of the total sample, 55% had been employed 9 to 12 months and 16% greater than 1 year. One quarter of the respondents were in private practice pathology groups, 22% were in fellowships, and 37% were in academic practices. Overall, respondents reported being least prepared in clinical laboratory management, regulatory and compliance issues, laboratory personnel management, billing and reimbursement issues, and grant preparation.

In mid 2006, the College of American Pathologists formed the CAP Graduate Medical Education Committee. This committee’s charge was to focus on the growing gaps in resident preparation for practice. Working collaboratively with the Executive Committee of the CAP Residents Forum, the CAP Graduate Medical Education Committee constructed a survey of training quality and preparation in AP and CP. The survey was administered in the third quarter of 2007 to 2 member cohorts: CAP fellows in practice 0 to 5 years and CAP junior members. Of the 198 fellows in practice for 0 to 5 years, 124 returned completed surveys for a response rate of 63%. Only 44% of fellow respondents reported that their training in CP adequately prepared them for practice (32% responded “for the most part” and 12% indicated “very much so”). Thirty-seven percent said they were “somewhat prepared,” while 13% responded “only slightly” and 6% responded “not at all.” Clinical pathology training was felt to better prepare respondents for formal testing (in-service exams and boards) with 62% responding “for the most part” or “very much so.” Significant deficits in CP training were identified, including opportunities for supervisory experience in the laboratory (a mere 21% answering “for the most part”
or “very much so”), sufficient raw data/interpretive experience (only 39% responding “for the most part” or “very much so”), and sufficient exposure to new/emerging technologies (41% responding “for the most part” or “very much so”). Additionally, only 37% of respondents felt prepared to participate in hospital medical staff activities (25% responding “for the most part” and 12% responding “very much so”). When queried about specific CP areas, respondents reported receiving good or excellent training less than half of the time in molecular pathology/cytogenetics, chemistry, and lab management. In contrast, 61% of respondents responded “very much so” when asked “To what extent did your training in anatomic pathology adequately prepare you for practice?” In general, topic areas within AP were rated better than individual areas in CP. The lowest AP ratings were given to questions about preparation to interact productively with AP quality systems, sufficient exposure to new/emerging technologies, orthopedic pathology, pediatric pathology, and dermatopathology. Once again, this survey identified significant deficiencies in resident training, particularly in CP, that negatively impacted readiness to practice.

The issues identified previously are well established and appear to be increasing in significance. The risks of maintaining the status quo are very high, not the least of which is loss of traditional pathology duties to other specialties. Development and routine use of technologies such as in situ hybridization and polymerase chain reaction are transforming AP practice. The future of pathology includes widespread use of digital technology and expert systems. Telepathology and technologies that bridge classic boundaries of pathology, such as the virtual autopsy, continue to expand. Pharmacogenomics and personalized medicine is a rapidly developing area of medicine that bridges multiple specialties and has a potentially significant role for pathologists. Many laboratories are providing enhanced reports to clinicians and patients that incorporate images, flow cytometric, cytogenetic, and molecular data. These enhanced reports are becoming the accepted standard for pathology reporting. Therefore, the pathologist of the near future must be able to produce these enhanced reports, capturing and conveying a “more complete answer” to the diagnostic question. In addition, these data will need to be warehoused and data-mined both as a form of research and to continuously improve patient care at the institutional and system level. These developments and many others will necessitate near constant updating of pathology training programs to prepare future pathologists to practice as well as to provide currently practicing pathologists with the skills required to be relevant and to advance the profession.

Pathologists are at risk of losing their influence as clinical consultants and in many cases are being viewed as producing a commodity product in both CP and AP. Yet, now more than ever, the hospital-based pathologist has opportunities to establish and grow his or her role as clinical consultant, contribute to broad and effective hospital quality plans, aggregate and issue clinical performance data for system improvement, and lead the enhancement of medical care in the hospital as one of the few physicians still practicing full-time throughout much of the hospital. This role contrasts with the current challenges of pathologists practicing in independent laboratories and reference laboratories, which are being buffeted by increased competition and new practice models that conspire to commoditize our professional efforts. Once again, new technologies and enhanced clinical integration can be effective strategies to mitigate these challenges and promote our profession.

It is important to mitigate the gaps in training now because the training process is typically 4 to 6 years (AP, CP, or most commonly AP/CP, plus 1 or 2 fellowships), which makes the cycle time for a trainee approximately 5 years. As such, the results of current training program changes become evident 5 to 7 years in the future. As medicine has evolved during the preceding half century, pathologists have been leaders in the process. It is the goal of medical educators and imperative for the specialty of pathology to remain ahead of the curve and to provide communities and patients with new physicians who are able to assist their more senior colleagues with skills that will not just bring all pathologists into the 21st century but also continually lead the profession ahead.

CURRENT PATHOLOGIST TRAINING—PLAYERS, PROCESS, LIMITATIONS

Oversight of resident training programs is the responsibility of the ACGME (www.acgme.org; accessed May 11, 2009). The ACGME accredits residency and fellowship training programs within the United States. Established in 1981, the ACGME is a private nonprofit organization with the mission to improve health care and advance the quality of resident physicians’ education through accreditation. Its board of directors is composed of 4 appointees from each of the member organizations (American Board of Medical Specialties, American Medical Association, Association of American Medical Colleges, American Hospital Association, and Council of Medical Specialty Societies). There are also 2 resident members, 3 public directors, the chair of the Council of Review Committee Chairs, and a nonvoting federal representative. The ACGME has 28 review committees, 26 representing each of the medical specialties, one responsible for transitional year programs, and one tasked with reviewing institutional programs. Members of the residency review committees are volunteers appointed by the American Medical Association Council on Medical Education in conjunction with specific specialty organizations for each specialty. The Pathology Residency Review Committee makes accreditation decisions regarding programs in pathology.

Program structure and requirements are established through common program requirements. Each specialty’s review committee also establishes specialty program requirements. These are periodically updated and are available on the ACGME Web site. Established programs are reviewed by the review committees following periodic site visits by representatives of the ACGME field staff. In preparation for a site visit, the program updates and submits a program information form, a comprehensive document describing its educational program. The site visitor reviews the program information form and, during a 1-day onsite visit, reviews documentation and other evidence to assess compliance with the program information form. The site visit also includes interviews with the program director, the designated institutional official, the department chairman, trainees, and key faculty representatives. The site visit is essentially a fact-finding mission. The inspector then prepares a report for the Pathology Residency Review Committee. Residency review committee members read the site visitor’s review report, the submitted
The Outcomes Project has the following timeline:

Phase I (July 2001–June 2002)
- Define specific objectives by competency

Phase II (July 2002–June 2006)
- Provide learning opportunities in all 6 competencies
- Develop evaluation tools in all 6 competencies

Phase III (July 2006–June 2011)
- Utilize data on resident performance to improve program
- Use external monitors to measure resident and residency program performance

Phase IV (July 2011 and beyond)
- Identification and dissemination of best practices

As of this writing, programs must have developed specific learning objectives in each competency, as well as multiple tools to measure performance in each of the competencies. All programs are providing aggregated resident performance data to their institutional graduate medical education committees for the purpose of internal review. Performance data are being actively used to improve the educational process and external measures, such as board pass rates and employer evaluations, are being used to verify the outcomes of the educational process.

In response to the requirements for carefully constructed goals and objectives in each of the 6 competencies as part of a comprehensive curriculum, certain national organizations have developed suggested curricula for resident education. Two of the more comprehensive curricula have been developed by the Association of Directors of Anatomic and Surgical Pathology for AP and the Academy of Clinical Laboratory Physicians and Scientists for CP. These curricula provide detailed outlines of suggested rotations as well as specific goals and objectives of these rotations. The length of time necessary to complete these detailed ideal programs is best accommodated by a 3-year (36 month) AP-only or CP-only program requirement. However, these curricula offer a substantial challenge for those residents in 4-year (48 month) AP/CP combined training programs as outlined by the ABP, which require 18 months each of structured anatomic and clinical pathology training with 12 flexible or elective months, which may include up to 6 months of dedicated research. Additionally, competency-based learning must allow time for remediation for those trainees having inadequate performance on a particular rotation, possibly extending the required 48 months of training. Extending training for even a month can trigger a host of timing issues for starting fellowships and practice positions, thus creating an impediment to extending training for remediation.

A second area of stress and challenge has been for the residency program director, an individual who serves as the educator of record for the ACGME. The program director is typically an otherwise clinically active pathologist who has completed training and served at least 5 years as a faculty member in association with a training program. As would be imagined, the burden of the additional documentation and curriculum development has fallen disproportionately on program directors, with resultant relatively high turnover. Many program directors, particularly junior ones, lack the ability to call on departmental resources or to fundamentally change the structure of the program or the behaviors of the other faculty members. In addition, program directors are sometimes challenged by inadequate clerical support. Many program directors are challenged by the sheer volume of required documentation (rotation evaluations, semiannual reviews, and new...
required summary/verification statement included in the final evaluation). At training completion, the program director must provide a summary evaluation that must “verify that the resident has demonstrated sufficient competence to enter practice without direct supervision.” This assurance places a heavy personal burden of responsibility on program directors.

The common program requirements include strictly enforced duty hour limitations. Duty hours are defined as time spent on clinical care and academic activities including in-house call. Reading and preparation that takes place at home or other site away from the hospital are not counted. Duty hours are limited to 80 hours per week averaged during a 4-week period, with 1 day in 7 free from all responsibilities averaged during a 4-week period. A 10-hour rest period between duty periods and after in-house call must also be provided. Although these duty hour regulations more typically impact residency programs such as obstetrics and gynecology, surgical specialties, and intensive care unit rotations, they occasionally impact pathology residency programs.

Resident education is often influenced by additional stressors. For example, according to the Association of American Medical Colleges, the average medical student graduates with debt in excess of $100,000. This increased debt load reflects higher tuition for medical school, increased debt carried from undergraduate studies, a higher prevalence of medical students with families including children, and lifestyle choices. This debt increases pressure on residents to moonlight and to pursue more lucrative employment opportunities/subspecialties.

The training environment has also become more challenging. Residents face 2 major hurdles—board certification and securing employment or fellowship. The national pathology fellowship application process is unorganized and fragmented. Some fellowships fill positions 3 years in advance, forcing many residents to select a subspecialty early in their residency, often before experiencing all possible subspecialty options. Many residents are enduring a semicontinuous application process through multiple years of residency. The CAP Graduate Medical Education Committee, Residents Forum, and APC are currently working on this issue. Some residents opt for multiple fellowships in an attempt to better prepare for the marketplace and to acquire greater exposure to wider practice varieties and numbers of cases. An additional challenge is posed by visa status issues for foreign medical graduates. Delays in issuing or renewing visas will often force foreign medical graduates to place their training on hold. Visa issues may also impact fellowship selection and eventual job choices when training is completed.

Changes in the practice of pathology and the pathology marketplace have increased the demands on clinical faculty to be both clinically and academically productive while being closely engaged in teaching. Some programs lack a broad spectrum of anatomic and clinical pathology cases because selected services have been outsourced or limited due to competitive pressures. Short turnaround time expectations for all types of services have increased pressure on training programs to reduce cycle times and potentially short change the educational experience.

Fellowship training, like resident training, is overseen by the ACGME. For each subspecialty area, there are subspecialty-specific requirements that detail the numbers of faculty, cases, and case mixes to enable a training program to be accredited. The fellowship accreditation process is similar to the residency program accreditation. Fellowships exist in subspecialty areas in which there are subspecialty boards administered by the ABP. Additionally, there are approximately 60 ACGME-accredited selective pathology fellowship programs that do not have a corresponding subspecialty board. Typically, larger academic centers have several fellowship training opportunities, while smaller institutions may have few or none. The impact of fellowships on residency education may be positive through good learning interactions. However, if the fellow is unable to teach or effectively acts as a barrier between residents and faculty members, then the impact can be neutral or negative. Nationwide, there is a significant percentage of fellowships that go unfilled either through lack of applicants or, in some cases, lack of funding. At the present time, dermatopathology and hematopathology fellowships are the most competitive, as evidenced by the ratio of the number of applicants to the number of available training positions.

CURRENT GAPS AND ORI GEINS

Gaps That May Develop Prior to Residency

Recent studies suggest that there are gaps that may be present at the time some trainees begin residency. Some of these are life-long in nature while others reflect deficiencies in preparation for pathology residency during medical school. Interestingly, the 6 identified prereidency gaps parallel 5 of the 6 general competencies. The identified gaps are in basic pathology knowledge, in the ability to make relevant clinical decisions, in habits conducive to life-long learning, in interpersonal and communication skills, in professionalism, and in knowing personal limitations.

The gap in basic pathology knowledge parallels the medical knowledge competency. Many residents begin residency without a firm grasp of histology, gross anatomy, chemistry, and portions of clinical medicine. This may reflect changing medical school curricula, with less emphasis on histology, pathology, and gross anatomy. The change in emphasis may result in a greater need than in the past for remediation of beginning residents in such areas as histology and gross anatomy. Potential strategies for closing this gap might include medical school curricula with defined minimum standards and/or use of remedial measures early in residency, which could compound the already taxed residency curriculum. These problems can be more intense for foreign-trained physicians because of time delays between medical school graduation and beginning residency training in the United States.

The inability to make practical and clinically relevant decisions reflects the general competency of patient care. This gap exists in some trainees just entering residency and most likely originates from lack of maturity, lack of experience applying knowledge, and poorly developed critical thinking skills. This gap becomes progressively more important through training and into practice as pathologists fail to recognize clinical needs and circumstances involved in their role as clinical medical consultant. Strategies for closing this gap include more emphasis on critical thinking exercises in college and medical school and the incorporation of more clinically oriented opportunities for consultation during residency in anatomic and clinical pathology. Potentially, partnerships with private
practice could be developed to pursue these opportunities in concert with more aggressive graduated responsibility for residents. An alternative approach would be to revisit the need for a year of clinical training prior to pathology residency. However, although a year of clinical training was implemented in 1985, it was quickly diluted by redefining what constituted the “fifth year” and this requirement was ultimately eliminated earlier in this decade.

A third gap, present for some residents prior to entering residency training, is in the development of life-long learning habits. This corresponds to the practice-based learning and improvement ACGME general competency and may reflect a slow but steady erosion in the expectations for education (more defined learning experiences with less emphasis on synthesis) and the slow erosion of the view of pathology and medicine in general as a profession. This gap results in an inability to stay current and by definition is an ever-widening gap. Strategies for closing this gap would include emphasis on problem-based learning experiences and the skills necessary to critically read the literature, testing that is predicated less on rote memorization and more on actual “hands-on” experience, initiation of documentation now required for the maintenance of certification process at the beginning of residency, and/or a greater degree of responsibility for patient care decisions during residency, which would engender a greater sense of purpose for the learning experiences.

The fourth gap that is occasionally manifest prior to the beginning of residency is a deficit in interpersonal and communication skills, which is directly reflected in the interpersonal and communication skills general competency. Unfortunately this gap is multifactorial and may reflect selection methods for pathology residency, self-selection into pathology by students with challenges in these areas, lack of mentors with good communication skills, and gaps potentially derived from language barriers for residents for whom English is a second language. This gap may manifest on a daily basis in that pathologists must have excellent written and verbal skills to provide adequate consultation. During a longer period, the gap threatens any leadership role for pathologists in laboratories and the larger medical community. Strategies for closing this gap might include more rigorous assessment of written and verbal communication skills during resident selection, implementation of remedial course work if indicated, mentorship programs with anatomic and clinical pathology faculty, more opportunities for residents to further develop these skills during residency using written consultations, verbal presentation, and other means of communication with timely and relevant feedback, as well as formal instruction in professional presentation and communication skills.

Lack of professionalism is another gap that is evident in some trainees at the beginning of residency. This gap is manifest by seeing pathology as only a job to support a lifestyle and is directly addressed as one of the general competencies. Contributors to this gap include generation-al differences, immaturity, societal change, the corporatization of medicine, and a general sense of malaise in the medical profession. The impact is both deep and wide-ranging with a perceived loss of self-identity and respect as a physician, less dedication to professional standards, and less sense of duty to patients and fellow physicians. This defect has broader implications as this trend tends to further fracture and thereby weaken the broad specialty of pathology as recent graduates pursue fairly constricted and controlled work settings. This is a particularly vexing gap to close, and strategies to mitigate the gap would include more active identification of role models at the onset of training, as well as more direct teaching of the concepts of professionalism in medical school. With implementation of competency guidelines at the Liaison Committee on Medical Education level and greater emphasis on the importance of professionalism and communication skills during medical school, positive changes are already being felt in many programs.

As students graduating from medical schools transition into their first year of residency, their level of responsibility changes dramatically. Often into the wards on day 1, new residents must break the mold formed by being handed a large syllabus containing all of the information that they need to know for an exam and the world of multiple choice questions. For example, a first year medical resident is often expected to juggle responsibility for 8 to 12 patients on an inpatient service, take call, research patients’ problems, and perform an array of procedures. They must show accountability to their patients, the medical team, and attending physician daily. Internal medicine, surgery, and many other clinical specialties foster this type of active learning and provide an environment that builds confidence, expertise, professionalism, and lifelong learning skills.

In contrast, pathology residents may fall into a passive learning style with little or no clinical responsibilities, clinical contact, or accountability. Many times, a pathology resident may not be given the opportunity or be expected to preview a patient’s slides, dictate and commit to a patient’s diagnosis prior to final sign-out, have a frozen section “hot-seat” experience, cut a patient’s frozen section, present and answer questions at clinical conferences related to their patient, evaluate and discuss the current literature in a journal club, consult with clinical teams, demonstrate laboratory management skills, dress appropriately for work in patient care, or play any meaningful role in the clinical laboratory at all, especially as a Post-Graduate Year 1 (PGY1). Furthermore, pathology residents may fall into the trap of worrying about looming board examinations that focus on medical knowledge rather than developing many of the practical skills necessary for success in practice (eg, gray areas of staging a tumor, evaluating or validating a new laboratory test, consulting with a clinical colleague on a transfusion or coagulation issue). Consequently, passive pathology residency training environments can lead to significant deficiencies in confidence, expertise, professionalism, and lifelong learning skills.

The ACGME has deemed professionalism one of the core competencies in residency training. Similarly, the ABP has made professional standing one of the criteria for maintenance of certification. In citing other publications, Domen succinctly states “the common thread running through most published definitions of professionalism are (sic) related to the physician’s use of his or her unique body of knowledge for the benefit of others or society above personal interests.” The successful trainee develops a very keen sense of dedication, honesty, commitment, intellectual fortitude, integrity, and respect for both patients and colleagues. Along with this comes an expectation that these lofty elements describing professionalism earn a de-
gree of respect, setting physicians distinctly apart as a profession.

To mitigate the apparent lack of professionalism, 3 basic strategies should be considered. The first strategy involves better modeling and mentoring by current faculty members. Secondly, didactic lectures and interactive discussions on professionalism may help keep the emphasis on development in this area. Finally, creating a greater sense of responsibility for patient care can be a potent tool in developing the resident’s heightened sense of professionalism. Creating opportunities for patient contact, as well as graduat ed responsibility to the level of actual decision making, should allow greater connection between the trainee and patients and the trainee and colleagues, thus facilitating development of the sense of professionalism.

A final gap that has its genesis prior to beginning residency is the failure of some trainees and young pathologists to recognize their limitations and appropriately seek consultation. This deficit corresponds to several of the competencies, namely patient care, medical knowledge, and professionalism. Individuals with strong egos, an unwillingness to admit lack of knowledge, and/or a fear to seek consultation (due to potential employment repercussions) can appear overconfident. These behaviors may produce occasional direct errors in patient care, attendant patient care implications, medicolegal consequences, and attendant loss of credibility. Strategies for closing this gap require that these behaviors be identified as early in training as possible. The combination of greater responsibility with forced commitment to diagnosis by residents beginning as early as possible in training should allow for identification of potential problems. Inclusion of residents in consensus conferences will allow them to see the degree of uncertainty expressed by attending pathologists and experience the full spectrum of consultation. Support for residents through opportunities for self-assessment and the availability and access to counseling services during medical school and residency training may have a distinct impact on these issues. Following training, good quality practice measures might include opportunities for new hires to actively participate in quality assurance/quality improvement reviews with mentoring by a more senior pathologist. This mentor not only will attend to the diagnostic skills and needs of the new hire but would also serve as a role model for further development of consultative skills.

Gaps That Have Their Genesis During Residency

The primary goal of residency training is to prepare the trainee for practice. Yet, some recent graduates are not adequately prepared to meet the challenges of practice in either the private setting or the university/academic setting. A number of factors are responsible for the current decline in readiness for the needs of the practice environment. One of these factors is a lack of graduated responsibility that would ultimately lead to independent decision making. Due to billing rules, medicolegal considerations, and ACGME regulations regarding supervision, all resident activities relating to patient care must ultimately be reviewed by the attending faculty. By the very nature of perpetuating the student status of the resident in this environment, the transition to independent decision making at the onset of practice cannot be made by all trainees.

This explains, at least in part, the predilection for residents to pursue additional training in the form of fellowship following completion of pathology residency. This is recognized by both the resident and the pathologists in practice looking to hire young pathologists. Fellowship training has become an exercise de rigueur, without which the newly graduated residents may be deemed inadequately prepared for practice. In fact, some subspecialty areas are even requiring an AP fellowship prior to consideration of an applicant for their subspecialty.

This unreadiness of some trainees to practice independently could be addressed through reintroducing effective pathology teaching in medical school, remedial training at the start of pathology residency, exposure to larger clinical case loads, and supporting an environment of meaningful graduated responsibility. The problem is further exacerbated by the widening chasm between the expansion of knowledge about disease processes and the growing limitations of clinicians in the utilization of increasingly complex information. In simple terms, the trainee must not only understand this explosion in information but also communicate this information such that the abyss between the pathologist and clinician is effectively bridged.

Some positive impact may be possible through the use of informatics to enrich the educational experience. Specifically, information systems allow for rapid retrieval of reference material and enhanced access to patient information pertinent to case materials. The systems permit the construction of digital image libraries, and their use can enhance utilization of published practice guidelines to augment the acquisition of good grossing skills and the development of the ability to construct a meaningful diagnosis. These, however, are not solutions per se.

A second identified gap that has its genesis in residency is the inability of some trainees to perform an adequate gross examination of a surgical specimen. Assessment of the gross specimen constitutes the initial process of anatomic diagnosis and is an essential step in establishing the disease process and, in the case of neoplasia, the stage of disease. Requirements for an adequate gross evaluation include a basic understanding of anatomy, the knowledge base for constructing a differential diagnosis for the disease process involving the resected specimen, and the technical skills to submit appropriate sections for histologic examination to resolve questions remaining following gross examination. The incoming pathology resident often lacks knowledge in basic anatomic landmarks, vascular supply, lymph node groups, and the method of surgical resection to handle a complex case effectively, requiring remediation or assistance at the gross bench.

The increasing role of the pathologists’ assistant (PA) in grossing surgical pathology specimens is a 2-edged sword. In many institutions, the PA is the front-line person handling the gross examination of resected specimens. If utilized effectively, the PA may serve an essential role in teaching the incoming resident the technical aspects of grossing a resection specimen. It is rare, however, that the PA has the capacity to construct a differential diagnosis for the probable disease process involving the specimen. Rather, the PA may be instrumental in guiding the resident in a proficient dissection of the specimen and additional functions such as gross imaging and lymph node dissections. Alternatively, the PA may play a causative role in the gross examination gap by examining too many of the specimens (perhaps with the acquiescence of the time-
pressed resident) and thus prevent the resident from developing efficient and accurate gross examination skills.

Compounding these issues is the steady decline in autopsy experience due to falling autopsy rates and an overburdened curriculum. In the past, AP residents spent much of their early experience in the autopsy environment learning in situ relationships between organs, end-stage disease, and most importantly how to demonstrate these findings through skillful dissection and submission of appropriate tissues for histologic examination. Unfortunately, the autopsy experience is receding as autopsy numbers have dramatically declined. Moreover, the incoming pathology resident may be placed directly into the surgical pathology rotation without the benefit of AP skills routinely mastered in the autopsy rotation.

Solutions to improve the acquisition of gross examination skills are very difficult to realistically impose on the current combined anatomic-clinical pathology curriculum and anatomic-only curricula. Innovative approaches include gross practice guidelines (with the addition of information technology aids, which may include visual aids online during the examination of the specimen). Such guidelines, however, assume a basic understanding of disease processes and should not be construed as a substitute for knowledge. An increased understanding of disease processes, real-time development of technical skills, a more developed responsibility of senior residents in instructing junior residents, and perhaps full integration of the PA's role in the education process may be necessary for adequate training in gross pathology. Attending faculty supervision and instruction are also essential in this process, but expanding demands placed on attending faculty renders this part of the solution challenging as well.

A disparity exists between residency training experience in pathology and the real-life experience of the recent graduate in the ability to handle the requisite volume of cases in practice. In the program requirements for pathology, the ACGME has specified that during the course of their training the trainee should handle at least 2000 surgical specimens (with a cursory description of specimen type and complexity), 1500 cytology specimens, 200 frozen section procedures, and 50 autopsies. In contrast, the new practicing pathologist needs to be capable of handling this volume (perhaps excepting the autopsy specification) or more in a single year. Part of the difference may stem from the teaching environment at sign-out, when the case and related topics are both explored, thus yielding a distinctly slower pace.

This case volume problem may be exacerbated by duty hour limitations on residents in training. Although these time constraints may not impact pathology training programs when compared with traditional clinical programs such as surgery or internal medicine, some pathology training programs have exceeded the time constraints, particularly regarding the 10-hour rule between shifts, usually requiring a reduction in resident in-house experience.

Other contributing factors to the discrepancy between resident training and actual practice include the lack of real-time, graduated responsibility for sign-out and structural issues in some programs, which limit the resident's ability to handle a case from accession to sign-out.

The principal mechanism to any solution involves exposure to a large volume of appropriately diverse cases during training in a meaningful real-time scenario. Didactic lectures, teaching conferences (intradenartmental and interdepartmental), and teaching aids such as digital image libraries, journal libraries, and various online (Web-based) learning tools do not substitute for real-time experience in AP. In the past, mechanisms for increasing trainee exposure have included the so-called “hot-seat,” an invaluable tool essentially requiring the trainee to view and provide provisional diagnoses on most surgical pathology cases seen in any given day. However, the hot-seat may be an impractical option in the current environment of reimbursement, medicolegal, and turnaround time restrictions. Rotations into high-volume community practices could also help mitigate these workload and turnaround time issues.

Increasing residents’ sense of responsibility can also be pursued by embracing the concept that the faculty “checks” the resident for accuracy of each case assigned from start to finish. With the aid of information technology and the use of template reporting (practice guidelines and check lists) the resident is now able to enter complete diagnoses (with remarkable efficiency and time savings) on each case to be critiqued and corrected when necessary by the supervising faculty (eg, http://adasp.org/Checklists/checklists.htm, http://www.cap.org/apps/cap.portal?nfptb=true&pageLabel=reference; accessed May 11, 2009). This concept also provides immediate feedback to the resident regarding specific difficulties and inaccuracies in the process of issuing a completed final diagnosis.

This gap in preparedness to practice independently has resulted in the perception that fellowships are mandatory for adequate training in AP. Yet, trainees completing ACGME-accredited fellowships with supervision regulations may still remain unprepared for the real world of practice, largely because many fellowships do not allow the fellow to act with full independence; accredited fellowships are funded through the institutional funding derived from Centers for Medicaid and Medicare Services, which may not allow unsupervised sign-out. Some programs have attempted to bridge the gap by offering fellowships at essentially a junior faculty level, relying on departmental funding (typically from practice revenues) independent of resident funds. This option may provide a very effective transition to practice but may be undesirable for the trainee because such fellowships do not prepare the trainee for a subspecialty certification.

Anecdotal evidence as well as survey data indicate that some trainees lack personal skills needed to be successful in practice. Among these skills, time and workload management are critical. The daily routine of the pathologist is seldom restricted to a single task. Although the pathologist may be on sign-out for the day, the questions or issues brought forward by clinicians, laboratory staff, the business manager, or administration must be resolved. Learning to prioritize effectively is necessary to successfully manage multiple demands.

Strategies to improve personal skill development could include specific skills training sessions for identified deficiencies, more active screening of medical school and residency candidates prior to selection, and structuring of training opportunities to emphasize the personal skills of time/workload management (by creating multiple assignment rotations) and communication (by emphasizing communication opportunities and providing timely and constructive feedback). However, structuring individualized programs for residents in need of remediation falls...
squarely on the already often overworked residency pro-
gram director.

There is a clearly identified gap in areas involving lab-
oratory management.1,2,3 Newly trained pathologists should 
have basic understanding of the medical director role of 
the pathologist in the laboratory. Necessary skills include 
strategic planning, budgeting, and management opera-
tions of the laboratory; personnel management issues; 
practice management issues such as coding, billing, col-
collecting, and contract negotiations; the pathologists’ role in 
the medical staff and medical community; and interacting 
with hospital or health care system administrators. There 
is general agreement that the pathologist entering practice 
has inadequate knowledge and virtually no experience or 
skill in these areas. The ideal training program includes 
a preparatory didactic course and an experiential rotation 
as a “laboratory director” involving graduated experience 
from shadowing to longitudinal decision making.

Unfortunately, many academic programs lack faculty 
who are experienced, interested in, and able to teach and 
mentor management issues. Many programs cannot pro-
vide appropriate experiences for trainees to practice and 
build on this skill set. Strategies for closing this gap in-
clude developing a list of expected management compet-
encies, adapting existing curricular experiences to sup-
port competency development, and encouraging training 
programs to implement a didactic course, either indepen-
dently or jointly with other programs and/or with other 
university departments, for example, the business school. 
Specifically, training programs must be structured to pro-
vide experiences in laboratory direction and management.

Residents should participate in decision making in the 
laboratory as it applies to quality, personnel issues, certifi-
cation and accreditation, and coding, billing, and compli-
ance issues.

Call to Action

Pathology and medicine as a whole are rapidly chang-
ing and significant gaps in the preparation of new 
pathologists will only grow larger. As the largest organiza-
tion of pathologists, the CAP has both a major stake and 
resources and therefore must be a major driver in ad-
ressing the issues. The CAP is the broadest representa-
tion of the profession and one defining role of a profession is 
to set standards. The APC/Program Directors Section 
of APC members create the training environment that de-
velops our trainees. As the true point of contact with train-
ees, APC/Program Directors Section of APC must also be 
a major driver of the issues and solutions.

The CAP Board of Governors and the APC Council have 
accepted this white paper as their joint position on the 
problems with resident preparation for careers in pathol-
ogy. The 2 organizations are sharing their position with 
internal and external groups, proposing solutions and 
building support for proposed solutions. Through a series 
of forums involving stakeholder organizations, the 2 or-
ganizations are working to build consensus.

Projects to develop and implement a comprehensive set 
of specific and measurable resident learning objectives that 
address the future of the specialty and define the 
knowledge, skills, and attitudes needed to perform suc-
cessfully in practice need to be funded and launched. All 
pathologists must work together in setting the standards 
for the profession. To support this effort, strategies and 
mechanisms to provide true graduated experience across 
all aspects of residency training that simulates the practice 
experience must be developed. Further, tools to teach and 
assess skills necessary for practice (eg, pathology practice-
specific simulation) are also needed.

Medical school pathology instruction including anato-
my, microanatomy, and pathophysiology should also be 
strengthened, both to prepare trainees for pathology res-
idency and to ensure that other clinical specialists have 
sufficient understanding of pathologic processes to pro-
vide appropriate care.

The time to act is now.

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