

Adequacy of Pathology Resident Training for Employment

A Survey Report From the Future of Pathology Task Group

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• **Context.**—The recent change in accreditation requirements for anatomic pathology and clinical pathology residency training from 5 to 4 years and the rapid advances in technologies for pathology services have sparked a renewed debate over the adequacy of pathology residency training. In particular, perceived deficiencies in training have been declared from a variety of sources, both in the form of recent editorial opinions and from surveys of community hospital pathologist employers in 1998, 2003, and 2005 by Dr Richard Horowitz.

Objective.—To obtain more comprehensive data on the perceptions of strengths and weaknesses in pathology residency training.

Design.—The College of American Pathologists conducted a survey of potential pathology employers (senior College of American Pathologists members, members designated as head of group, and members of the Association of Directors of Anatomic and Surgical Pathology). Also surveyed were recent graduates of pathology residency programs, who were identified as being junior members of the College of American Pathologists, were recent recipients of certification from the American Board of Pathology, or were contacted through their directors of pathology residency programs.

Results.—There were 559 employer respondents, of whom 384 were responsible for hiring and/or supervising new pathologists. There were 247 recent graduates of pathology residency training programs who responded. From the employers' standpoint, the majority expressed overall

satisfaction with recent graduates, but almost one third of employers indicated that new hires had a major deficiency in a critical area. Specific areas of deficiency were clinical laboratory management and judgment in ordering special stains and studies. In addition, one half of employers agreed that more guidance and support for newly trained pathologists is needed now than was required 10 years ago. Academic employers generally were more satisfied than private sector employers. Newly trained pathologists did not appear to be inappropriately overconfident in their abilities. In addition, their perceptions of those specific areas in which they are most and least prepared are very similar to the ratings provided by employers. On average, newly trained pathologists' ratings of their own preparedness are highest for specific aspects of general pathology and anatomic pathology, and lowest for specific aspects of clinical pathology and administration. In selecting new pathologists, employers perceived medical knowledge and interpersonal skills as the most important discriminating applicant characteristics. When new employees were asked why they thought they were offered their position, the discriminating qualifications cited most often were academic background and training, as well as completion of a fellowship and subspecialty training.

Conclusions.—It is our hope that the results of this survey can be used as input for further discussions and recommendations for training of pathology residents so as to further advance the ability of pathologists to provide quality patient care upon their graduation from training.

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The practice of pathology is central to virtually all forms of patient care, as laboratory medicine, anatomic pathology and, increasingly, molecular pathology constitute a basis for the majority of patient care management de-

terminations.¹ The practice of pathology requires competency in a vast array of skill sets: knowledge about the manifestations and causes of virtually all forms of human disease, knowledge about any and all technical modalities for correctly identifying human disease, knowledge of the prognostic and therapeutic implications of pathology interpretations, and the management skills necessary for overseeing the operation of an accurate, efficient, and effective pathology laboratory. Moreover, pathologists must have well-developed communication and leadership skills so as to work effectively with both the technical staff and hospital administration for the performance of the clinical laboratory and with physician providers for the care of their

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patients. Accordingly, the training of pathology residents for practice is critical for the ongoing success of our medical care delivery system.

A key question is whether graduates of pathology residency programs are ready to take on the full responsibilities of pathology practice. This is not to question whether graduating pathology residents are competent to practice medicine, but rather whether they have acquired a sufficient number of skills to function independently as practicing pathologists immediately upon graduation. A derivative question is whether the ancillary skill sets of management, communication, and leadership are sufficiently developed.

The answers to these questions will be highly dependent upon what responsibilities are required of the graduate immediately upon employment. Pathology is a highly collaborative specialty in that pathologists at all levels of seniority work closely together in the practice environment. Rather, what is important is that the pathology graduate be able to meet core requirements of employment and recognize when consultation is needed. The third question then becomes, "What are the core requirements of initial employment?"

While the requirements for training in anatomic pathology and clinical pathology are well documented through the program certification process of the Accreditation Council for Graduate Medical Education (ACGME), a number of recent independent publications have addressed perceived deficiencies in such training. The 1995 Graylyn Conference Report² called for reform of clinical pathology residency training and was followed by an oft-quoted description of the activities of the pathologist in the clinical laboratory.³ Therein followed the first of three surveys by Richard Horowitz to address the questions, "What does the community hospital pathologist want, need, or look for when employing a new young pathologist?" and "Are training programs turning out a product that satisfies our needs?"^{4,5} Commentary has been given⁶ about how pathology graduate medical education can be accomplished in light of the the six competencies now required by the Outcome Project of the ACGME, with a detailed recent update.⁷ Meanwhile, leaders in the Association of Directors of Anatomic and Surgical Pathology and the Academy of Clinical Laboratory Physicians and Scientists in 2003 and 2006, respectively, published detailed recommendations for curriculum content and evaluation of resident competencies, with double and triple publication for emphasis.⁸⁻¹² Further curriculum commentary from the Academy of Clinical Laboratory Physicians and Scientists and the American Association of Clinical Chemists was provided in 2006,¹³⁻¹⁷ reflecting as well upon the fact that the demands for performance as a pathologist are rapidly changing.

This topic has become particularly timely, given current concerns about the specialty of pathology. First, with the elimination of the requirement for a credentialing year and the decrease in pathology residents' training from 5 years to 4, are graduation competencies being achieved? Second, with the aging of the American population and the increasing need for medical practitioners, is the specialty of pathology going to be able to meet the manpower needs in the workforce? Third, is pathology a sufficiently attractive specialty for graduates of American schools of medicine? To address these broader concerns, a "Future of Pathology" Task Group was convened in July 2004 un-

der the auspices of the College of American Pathologists (CAP), with quarterly meetings in whole or in part thereafter. In consideration of the above questions, one of the issues identified by this group as crucial to ensuring the successful future of the specialty concerns the extent to which pathology residency training adequately prepares residents to enter practice and perform the core duties associated with their new roles. A survey instrument was initiated, with the goal of assessing the current state of pathology resident training in the eyes of both graduates and employers. Information also could be obtained regarding the pathology job market and employment process.

Reported herein are the results of this survey. Overall, there was moderate satisfaction on the part of both employers and recent pathology graduates in regard to the residency training. Needs and deficiencies were noted by both parties. It is our hope that the results can be used as input for further discussions and recommendations for training of pathology residents so as to further advance the ability of pathologists to provide quality patient care upon completion of their training. In addition, these results provide some insight into the apparent qualifications of new pathologists entering the job market.

MATERIALS AND METHODS

The results presented in this report were compiled from two online surveys: one distributed to employers of pathologists, and the second to residency program graduates who had recently obtained employment.

Employer Survey

The target population of the employer survey was pathologists who hire and/or supervise pathologists (in any setting). The survey was designed to assess employer satisfaction with the quality of applicants for pathologist positions and employer perceptions of the strengths and weaknesses of new hires. In addition, the survey included several items designed to provide information on typical hiring and recruitment processes as well as the general availability of open positions in the current market.

In order to ensure as representative a sample as possible, potential respondents were identified using the following three strategies.

- First, the survey was distributed to a list of 722 CAP members who were identified as heads of groups.
- Second, the survey was sent to 182 members of the Association of Directors of Anatomic and Surgical Pathology.
- Finally, the survey was distributed to a sample of 2967 more experienced CAP Fellows (ie, who passed their boards between 1980 and 1994) but who were not included in either the heads of group or Association of Directors of Anatomic and Surgical Pathology lists.

In mid-May 2005, an e-mail request and link to the Web-based survey was sent to the individuals in all three groups listed above. In order to ensure that these individuals met the target population criteria, the first question of the survey asked, "In your current role, are you responsible for hiring and/or supervising pathologists who are recent graduates of residency training programs?" Respondents who answered *No* were directed to a "Thank you" page. Respondents who answered *Yes* were asked to complete the remaining questions.

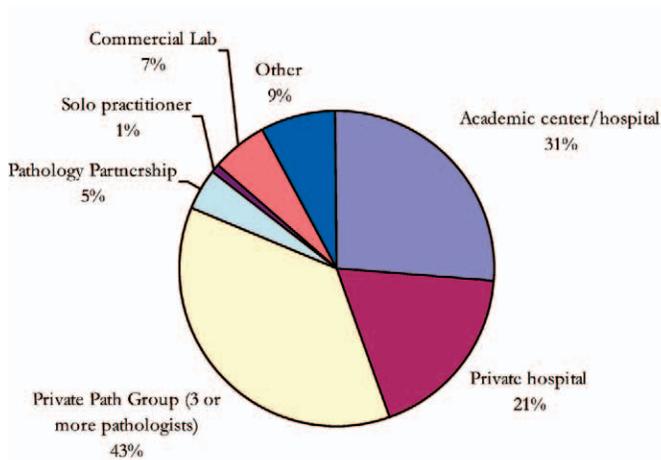
Newly Trained Pathologists Survey

The target population of the newly hired pathologists online survey was pathologists who had completed their residency and begun employment (in any setting) on or after January 2003. The population included both board-certified and non-board-certified pathologists. The survey was designed to assess new pa-

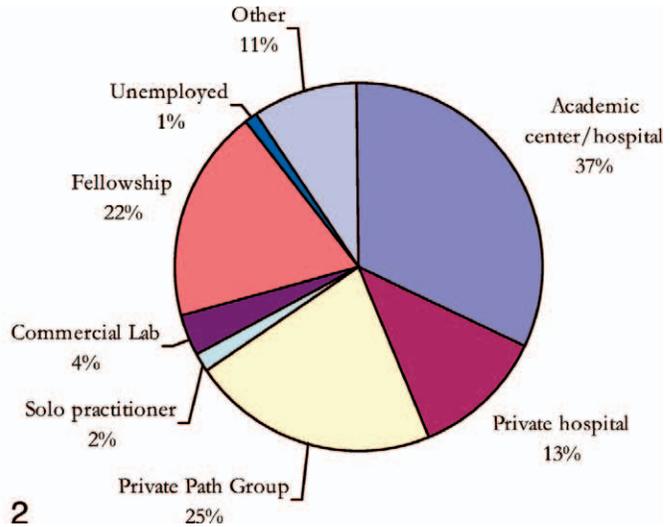
Survey Subsample	Total No. of Survey Recipients	Total No. of Completed Surveys	Total No. Completed by Those Who Supervised and/or Hired New Pathologists	Survey Response Rate, %†
Heads of groups	722	110	90	12
ADASP members	182	44	39	21
Experienced CAP Fellows	2967	405	255	9

* ADASP indicates Association of Directors of Anatomic and Surgical Pathology; CAP, College of American Pathologists.

† Based on the number of individuals who completed the survey and indicated they were responsible for hiring and/or supervising new pathologists.



1 Figure 1. Responses to the question, "Which of the following best describes your practice setting?" on the employer questionnaire.



2 Figure 2. Responses from newly trained pathologists regarding where they were employed.

thologist perceptions of the extent to which they were prepared by their residency program for their new role and job requirements. In addition, it included items designed to gauge respondents' experiences with the job search process. The survey was distributed in mid-May 2005 via an e-mail request and link to a Web-based survey. To reach this population of newly hired pathologists, the following strategies were used.

- The survey was distributed to all CAP Junior Members who completed their residency program on or after January 2004. This list consisted of 732 individuals.
- As a list of those who completed their residency on or after January 2003 was unavailable, the survey also was distributed to all CAP Junior Members who completed their boards in 2003. This list consisted of 200 individuals.
- Finally, an e-mail request containing the survey link was sent to 134 pathology residency program directors asking them to forward the survey to individuals who had graduated from their programs since January 2003.

To ensure that those completing the survey fit the criteria of the target population, the first question of the survey asked, "Did you complete your pathology residency program and obtain employment (including a fellowship) on or after January 1, 2003?" As with the employer survey, respondents who answered *No* were directed to a "Thank You" page. Respondents who answered *Yes* were asked to complete the remaining questions.

RESULTS

Respondent Demographics

Employers.—For the employer survey, a total of 559 completed surveys were returned, with 384 respondents indicating they were responsible for hiring and/or super-

vising newly trained pathologists. The response rates for each group of respondents are shown in Table 1. Just under two thirds (61%) of employer respondents described their current role as a *Head of group/chairman of department*, whereas 29% indicated they are a *Member of group/staff pathologist*.

The largest number of employer respondents (43%) indicated that their practice setting is a *Private pathology group*. Other large groups of respondents reported that they worked in an *Academic center/hospital* (31%) or a *Private hospital* (21%). Figure 1 depicts the percentage of employers who fell into each practice setting category included on the survey.

Newly Trained Pathologists.—Of the 247 respondents who completed the survey and met the screening criteria, 45% reported completing their residency in 2003, 47% reported completing their residency in 2004, and 8% reported completing their residency in 2005 (Table 2).

When asked how long they have been employed in their current position, the largest number of newly trained pathologist respondents (55%) indicated they had been employed between 9 and 12 months. Remaining respondents who provided this information indicated that they had been employed for either more than 1 year or less than 1 month (16% each).

As shown in Figure 2, the largest single group (37%) of newly trained pathologists responding to the survey indicated they were employed with an *Academic center/hospital*. Another 25% were employed by a *Private pathology group*, and 22% had a *Fellowship*.

Table 2. Newly Trained Pathologist Demographics				
	Yes, No. (%)	No, No. (%)	Total Responses	Missing
Did you complete your pathology residency program and obtain employment (including a fellowship) on or after January 1, 2003?	201 (81)	46 (19)	247	0
If no to the above question, please indicate which of the following applies.				
			Frequency	Percent
I completed my residency prior to January 2003.			31	79
I completed my residency program after January 1, 2003, and am currently seeking employment.			7	18
I have been hired but have not yet started working.			1	3
Total No. of Respondents			39	

Overall Perceptions of Resident Training and Preparedness for Practice

In general, employers were moderately satisfied with the preparation of job applicants and new hires who had recently completed their residency programs:

- A total of 57% of employer respondents were *Very Satisfied* or *Satisfied* with their new hires.
- Among the remaining respondents, 29% indicated they were *Neutral*, and 14% reported they were either *Dissatisfied* (11%) or *Very Dissatisfied* (3%).
- When asked to rate the extent to which newly trained pathologists they hired were prepared to enter practice, 67% of employers reported they were *Very Prepared* or *Prepared*. However, 33% of employers reported they were only *Somewhat Prepared* or *Only Slightly Prepared*.
- Just less than one third (31%) of employer respondents reported that the newly trained pathologists had any major deficiencies. Employers most often noted dissatisfaction with management, surgical pathology, or interpersonal skills.

Similarly, most newly trained pathologists reported moderate levels of confidence in their skills as pathologists as a result of their residency program training.

- When asked to rate their confidence in their skills as a pathologist, 74% indicated they were *Extremely Confident* or *Confident*.
- Most newly trained pathologists (82%) said they either *Strongly Agree* or *Agree* with the statement, "I feel my training was sufficient to meet my employer's expectations."

A closer examination of employer ratings reveals that those who worked in an academic center/hospital reported higher levels of overall satisfaction with the preparation of newly trained pathologists than those who worked in other settings.

- A total of 71% of academic employers reported being either *Satisfied* or *Very Satisfied* with newly trained pathologists who applied for their open positions in the last year, compared with 50% of employers working in other settings.
- A total of 45% of academic employers reported that the newly trained pathologists they hired were *Very Prepared*, but only 26% of employers working in other settings thought so.

Employers expected to provide additional guidance and support to newly trained pathologists as they transitioned to their new roles. When asked about the extent to which they expected they would need to provide additional

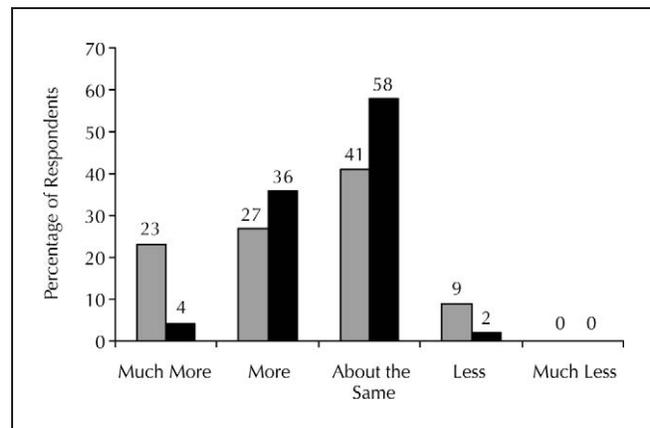


Figure 3. Responses to the question, "How much guidance and support do newly trained pathologists need to fulfill their job responsibilities?" Gray bar, compared with 10 years ago; black bar, compared with 5 years ago.

guidance, over one half (61%) indicated *Very Much So*, and 27% indicated *For the Most Part*.

Moreover, employer ratings suggest a perceived increase in the levels of guidance and support needed for newly trained pathologists over the last decade. There seemed to be an increase in the levels of guidance needed compared with 10 years ago, with 50% of respondents reporting that it was either *Much More* or *More* (Figure 3).

Key Drivers of Overall Perceptions of Resident Training and Preparedness for Practice

To address which factors shape employer satisfaction with the overall preparedness of newly trained pathologists to enter practice, both survey groups were asked to rate the extent to which newly trained pathologists had been prepared to perform competently in specific aspects of practice within each of the following categories: *General Pathology*, *Anatomic Pathology*, *Clinical Pathology*, *Administration*, and *Research/Academics*. To determine which aspects of practice were statistically predictive of employers' perceptions of overall preparedness for practice among newly trained pathologists, further analyses were conducted to identify "key drivers." These results indicate there are four specific aspects of resident preparedness that predict the employer perception of the extent to which newly trained pathologists are prepared to enter practice.

- Appropriately seeking coworker/senior pathologist consultation on cases is the biggest predictor of overall preparedness, and this accounted for 66% of the total explained variance.

Table 3. Perceived Preparedness of Recent Pathology Graduates by Skill Set

Employers		Newly Trained Pathologists	
Item	Mean Rating	Item	Mean Rating
Areas Receiving 5 Highest Preparedness Ratings			
Appropriately seeking coworker/senior pathologist consultation on cases	4.36	Anatomic pathology overall	4.20
Anatomic pathology overall	4.16	Appropriately seeking coworker/senior pathologist consultation on cases	4.12
Appropriately seeking outside/expert consultation on cases	4.06	Judiciously ordering special studies and stains	4.09
Independent signout of surgical cases	4.02	Hempathology	4.07
Intraoperative frozen section diagnosis	3.96	Autopsy pathology	3.99
Areas Receiving 5 Lowest Preparedness Ratings			
Understand regulatory and compliance issues related to the lab	2.63	Laboratory management (clinical)	2.84
Laboratory management (clinical)	2.58	Understand regulatory and compliance issues related to the lab	2.71
Understand and manage laboratory personnel	2.48	Understand and manage laboratory personnel	2.49
Write a grant application	2.44	Understand and manage billing issues	2.28
Understand and manage billing issues	2.31	Write a grant application	1.81

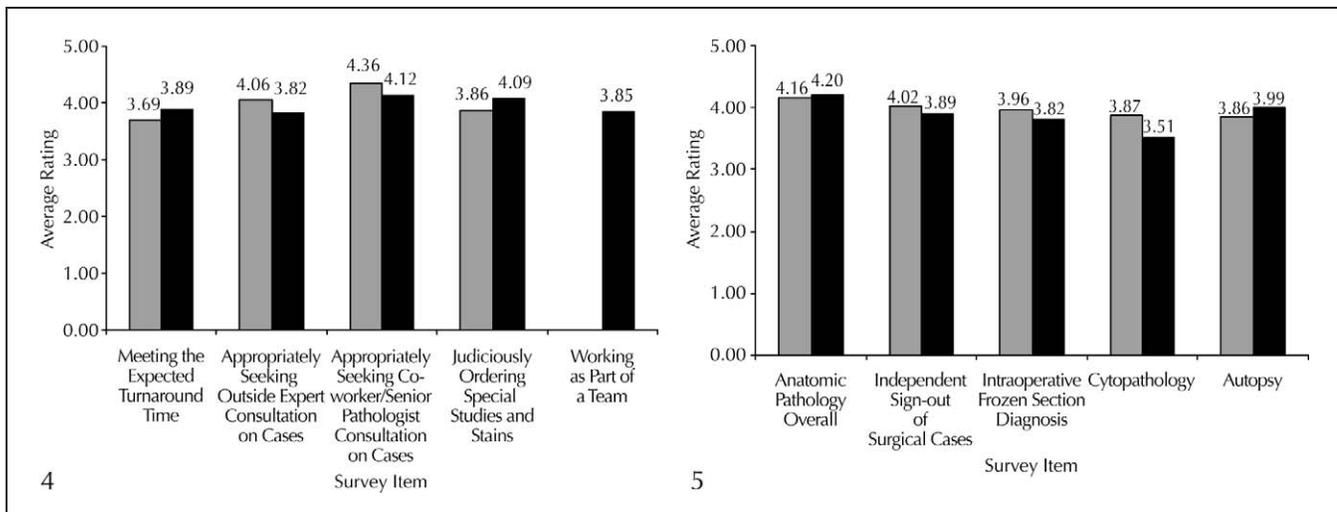


Figure 4. Mean ratings of general pathology preparedness. Gray bar, employers; black bar, newly trained pathologists. Note: “Working as part of a team” was not asked of employers.

Figure 5. Mean ratings of anatomic pathology preparedness. Gray bar, employers; black bar, newly trained pathologists.

- Judiciously ordering special studies and stains.
- Management skills in the clinical laboratory.
- Independent signout of surgical cases.

Across all ratings of preparedness, employers and newly trained pathologists were generally in agreement regarding those areas in which recent graduates were most and least prepared. In other words, as shown in Table 3, the pattern of ratings for each group from highest to lowest was very similar, with both groups indicating that newly trained pathologists were least prepared for aspects of administration. Average preparedness ratings on administration items ranged from 2.31 to 2.63 for employers and 2.28 to 2.71 for newly trained respondents. There also was some agreement that newly trained pathologists were most prepared for some specific aspects of general pathology as well as anatomic pathology.

General Pathology.—The majority of respondents in both groups (75% employers, 73% newly trained pathol-

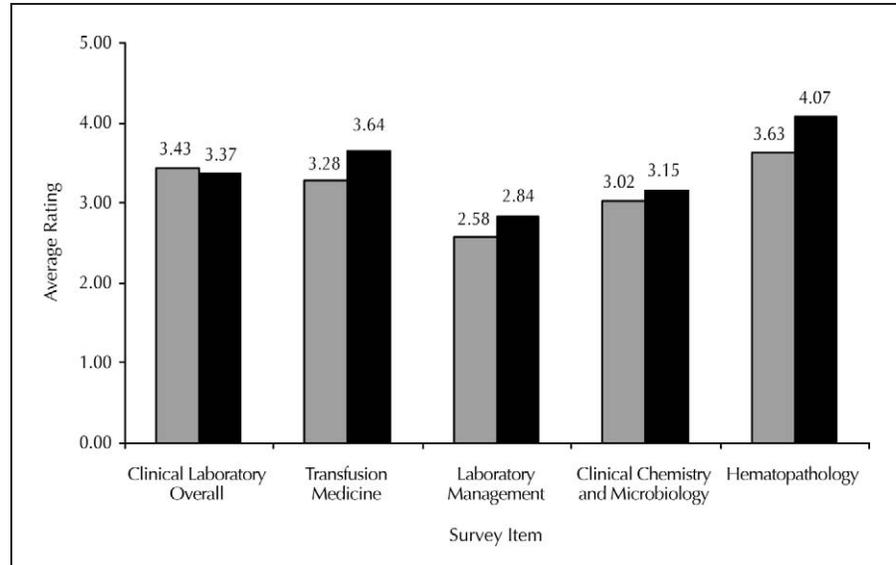
ogists) reported that newly trained pathologists were prepared either *Very Much So* or *For the Most Part* for each of the four aspects of general pathology.

- Both groups of survey recipients agreed that newly trained pathologists were most prepared for *Appropriately seeking coworker/senior pathologist consultation on cases* (Figure 4).
- However, when asked about preparedness for *Appropriately seeking outside/expert consultation on cases*, employers rated newly trained pathologists as more prepared (average rating, 4.06) than newly trained pathologists rated themselves (average rating, 3.82; data not shown).
- In contrast, newly trained pathologists rated themselves as being more prepared (average rating, 4.09) for *Judiciously ordering special studies and stains* than did employers (average rating, 3.86; data not shown).
- Among other general pathology items, respondents in both groups tended to indicate that newly trained pa-

Table 4. Perceived Preparedness of Recent Pathology Graduates by Employer Group

	Academic Employers	Other Employers
Meeting the expected turnaround time	4.00	3.43
Appropriately seeking outside/expert consultation on cases	4.30	3.87
Appropriately seeking coworker/senior pathologist consultation on cases	4.53	4.22
Judiciously ordering special studies and stains	4.14	3.63

Figure 6. Mean ratings of clinical pathology preparedness. Gray bar, employers; black bar, newly trained pathologists.



thologists were least prepared for *Meeting the expected turnaround time*.

As with the overall ratings, employers who worked in academic centers/hospitals indicated that newly trained hires were more prepared in general pathology than those employers who worked in other settings. Academic employers rated the preparedness of their newly trained hires consistently higher than other employers in all four aspects of general pathology that were included on the survey (Table 4).

Anatomic Pathology.—Most respondents in both groups (84%–85%) agreed that newly trained pathologists were prepared for *Anatomic pathology overall* either *Very Much So* or *For the Most Part*. However, when asked to rate four more specific aspects of anatomic pathology, preparedness ratings tended to be somewhat lower (Figure 5). In particular, respondents from both groups assigned *Cytopathology* lower ratings. However, newly trained pathologists rated themselves as being significantly less prepared for this aspect of anatomic pathology than employers rated newly trained pathologists.

Employers who worked in academic centers/hospitals were more likely to report that newly trained hires were very prepared for both independent signout of surgical cases and intraoperative frozen section diagnosis. While 46% of academic employers reported that newly trained hires were prepared *Very Much So* for independent signout of surgical cases, only 19% of other employers indicated this was so (average ratings, 4.31 and 3.79, respectively). A similar pattern was found for intraoperative frozen section diagnosis (academic average, 4.18; other average, 3.77).

Clinical Pathology.—As shown in Figure 6, ratings of

preparedness for specific aspects of clinical pathology were mixed.

- While both groups of survey respondents agreed that among the five aspects of clinical pathology they were asked to rate, newly trained pathologists were most prepared for *Hematopathology*, employers rated newly trained pathologists as being significantly less prepared (average rating, 3.63) than the pathologists rated themselves (average rating, 4.07). Among employers, one third (34%) indicated newly trained pathologists were prepared for *Hematopathology* only *Somewhat*, and 8% indicated they were prepared *Only Slightly* or *Not At All*. Only 16% of employers indicated newly trained pathologists were prepared for this area *Very Much So*, whereas 41% indicated they were prepared *For the Most Part*.
- Employers also rated newly trained pathologists as being significantly less prepared (average rating, 3.28) in the area of *Transfusion medicine* than the pathologists rated themselves (average rating, 3.64).
- Both employers and newly trained pathologists had very mixed views regarding preparedness in the area *Clinical chemistry and microbiology*. While 36% of employers indicated that newly trained pathologists were *Somewhat* prepared in this area, other large proportions indicated they were prepared either *For the Most Part* (30%) or *Only Slightly* (25%).
- The area of *Laboratory management* was among those areas receiving the lowest preparation rating, with almost one half (48%) of employers and 38% of newly trained pathologists indicating that newly trained pathologists were prepared *Only Slightly* or *Not At All* within this area.

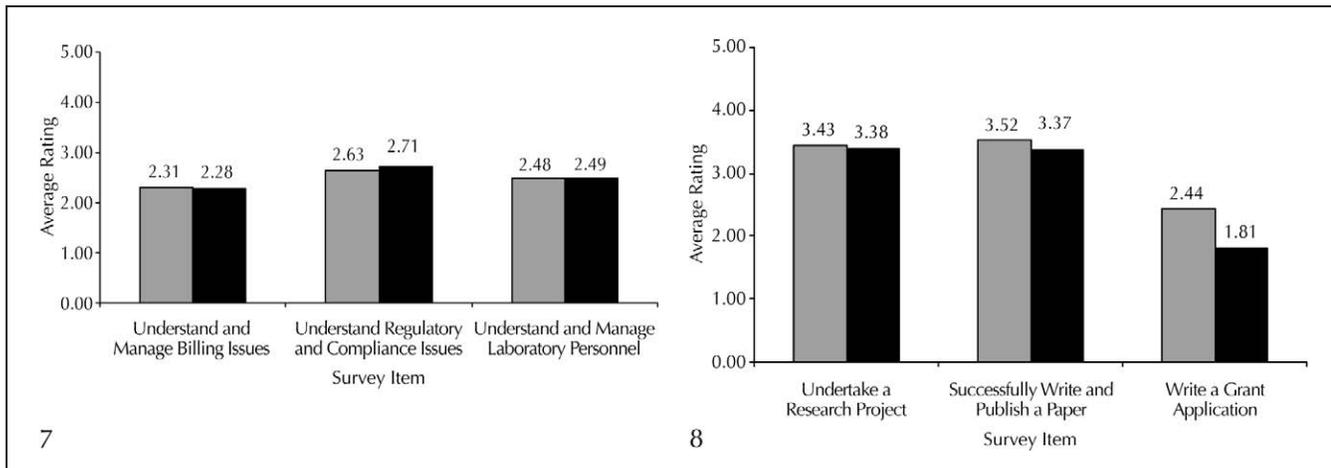


Figure 7. Mean ratings of preparedness for areas of administration. Gray bar, employers; black bar, newly trained pathologists.

Figure 8. Mean ratings of preparedness for areas of research/academics. Gray bar, employers; black bar, newly trained pathologists.

Administration.—Respondents in both groups consistently rated the preparedness of newly trained pathologists very low in specific aspects of administration (Figure 7).

- When asked about the extent to which newly trained pathologists who had recently been hired were prepared for three specific aspects of administration, on average 34% of employers indicated they were prepared *Somewhat*, 32% reported they were prepared *Only Slightly*, and 19% said they were *Not At All* prepared.
- Newly trained pathologists' ratings of themselves showed a similar pattern, with 29% indicating they were prepared *Somewhat*, 36% saying they were prepared *Only Slightly*, and 17% responding they were *Not At All* prepared.

Research and Academia.—Both employers and newly trained pathologists agreed that one of the areas recent graduates were least prepared for was *Write a grant application*. This was particularly true in the case of newly trained pathologists' ratings of themselves. More than one half (57%) of newly trained pathologists indicated that they were *Not At All* prepared to write a grant. Ratings of preparedness for the other two aspects of research/academics were higher (Figure 8).

Hiring Practices

Employers rated *Medical knowledge* and *Interpersonal skills* as very important factors in determining whether or not an applicant is selected. Almost three quarters (74%) of employers indicated that *Medical knowledge* is *Extremely Important* in determining whether an applicant is chosen, and another 25% indicated it is *Important*. A similar pattern of ratings was found for *Interpersonal skills*. Average importance ratings for each of these factors on a 5-point scale were 4.73 and 4.67, respectively.

Employers' ratings of the importance of *Specialized training* in determining whether or not an applicant is selected varied, with academic center/hospital employers rating the importance of this factor significantly higher than other employers. Just less than one half (46%) of academic employers indicated *Specialized training* was *Extremely Important*, compared with 22% of other types of employers.

The average importance rating of this factor among academic employers was 4.33, whereas the average rating among other employers was 3.70.

Most employers rated the *Recommendation of chair/program director* as moderately important in the selection of new hires. The largest number of employers (42%) indicated this factor is *Important*, whereas another 28% indicated it is *Extremely Important*, and 24% indicated it is *Somewhat Important*. This translates to an average importance rating of 3.89 on a 5-point scale.

Involvement in a national professional organization and *Research publication experience* were rated as being relatively low in importance in selecting new pathologists.

- Almost equal proportions of employers indicated that *Involvement in a national professional organization* was either *Somewhat Important* (35%) or *Only Slightly Important* (31%). Another 21% of employers indicated this factor was *Not At All Important* (average importance rating, 2.40 on a 5-point scale). In a related finding, 65% of recent graduates agreed that their residency program encouraged active participation in professional medical societies or organizations.
- Overall, employer ratings of *Research publication experience* showed a similar pattern of results. However, a closer look at these ratings indicates that academic employers were more likely to rate this factor as either *Extremely Important* or *Important* (51%) than other types of employers (30%). The average importance rating of this factor among academic employers is 3.50, whereas the average rating among other employers is 2.05.

Academic employers were more likely to indicate they had a written job description or outline of job responsibilities (63%) than other types of employers (36%; Table 5). The largest number (84%) of employers indicated they typically advertise pathologist positions by *Word of mouth/networking*. Large proportions of employers also indicated they use a *Position listing service* (46%) and *Major medical journal* (41%) to advertise their open positions. Another 25% indicated they use *Message boards at professional meetings*.

Similarly, newly trained pathologists most frequently (68%) indicated they used *Word of mouth/networking with*

Table 5. Response by Employers to, "Do You Have a Written Job Description or Outline of the Job Responsibilities for Your Open Pathologist Positions?"

	Academic Employers, %	Other Employers, %	All Employers, %
Yes	63	36	44
No	17	37	31
Not applicable	20	28	25

Table 6. Response by Employers to, "Do You Give a Practical Test to Applicants?"

	Academic Employers, %	Other Employers, %	All Employers, %
Yes	12	37	30
No	88	63	70

colleagues to identify potential job opportunities. However, newly trained pathologists also frequently indicated they used several other means of identifying job opportunities, including *Web advertisements* (55%), *Position listing service* (50%), and *Print advertisements* (40%). Another 35% indicated they used *Employment listings from desired geographic locations*, and 28% located job opportunities through the recommendation of their program chairs.

Overall, only a small proportion of employers gave applicants a practical test. However, as shown in Table 6, those employers who did give a test were much more likely to be employers in private and other types of practice settings than those in an academic center/hospital setting. Of the respondents who indicated the type of tests given, the most frequent areas covered included *Surgical Pathology* (53%), *Cytology or Cytopathology* (32%), and *Anatomic Pathology* (30%).

Recent Graduates' Experiences With the Search for Employment

Pathologist applicants typically prepared curricula vitae and interviewed with their prospective employers prior to being offered a position. Almost all (99%) of the newly trained pathologists indicated they had prepared a curriculum vitae. In addition, 84% of respondents reported that they had interviewed with their prospective employer prior to being offered their current position. This task group finds it interesting that 16% of job applicants did not interview with their prospective employer prior to being offered a position!

Newly trained pathologists' reports regarding the support they received from residency programs in finding a job were mixed.

- Just less than one half of recent graduates either *Agree* (25%) or *Strongly Agree* (21%) that *My residency/fellowship program director assisted me with finding a job*, whereas 27% indicated they were *Neutral*, and 27% either *Disagree* or *Strongly Disagree*.
- Similarly, 52% of respondents provided positive responses (either *Very Much So* or *For the Most Part*) when asked about the extent to which their residency programs helped them to find a job. Another 25% indicated their residency program supported them *Somewhat*, whereas 23% indicated they were supported either *Only Slightly* or *Not At All* (average rating on a 5-point scale, 3.36).

- Recent graduates' ratings of the support they received from their residency program in negotiating a contract for a position were even lower, with 43% indicating the extent they were given support in this area was *Not At All* and 21% indicating it was *Only Slightly* (average rating, 2.10 on a 5-point scale).

Most newly trained pathologists agreed that their residency program prepared them for passing the pathology board exams. More than two thirds (69%) of recent graduates indicated their residency program had prepared them either *Very Much So* or *For the Most Part* for passing the boards (average rating, 3.82 on a 5-point scale).

While many new pathologists believed their residency program prepared them for passing the pathology board exams, a somewhat smaller group agreed that the program prepared them for finding a job. Very few respondents indicated that the program prepared them to negotiate a contract for a position. Newly trained pathologists' opinions about whether they would have benefited from additional training in either effective interviewing techniques or negotiation skills were varied. One half (50%) of respondents indicated they would have benefited from more training in negotiation skills either *Very Much So* or *For the Most Part*, whereas 23% indicated they would have benefited *Somewhat* (average rating, 3.55 on a 5-point scale). Ratings of the benefits of additional training in effective interviewing techniques were lower, with only 32% indicating they would have benefited from training in this area either *Very Much So* or *For the Most Part* (average rating, 3.08 on a 5-point scale.)

More than 150 pathologists answered the question, "Why do you think you were offered the position? In other words, what qualifications did you have that convinced your employer to hire you?" As shown in Table 7, the largest number of new employees cited their academic background/training or fellowship as a key factor in their employer's hiring decision.

Indicators of the Current State of the Pathologist Job Market

When asked to indicate the number of open positions in their practices, employers most frequently indicated that there were *None*. Fewer than one half had any current pathologist openings, and very few employers reported had more than two open positions. However, as shown in Figure 9, those employers from academic center/hospital settings were more likely to report the existence of openings in their organizations than those from other types of practice settings. A greater percentage of academic center/hospital employers relative to employers in other types of settings reported having one or more openings for pathologists.

The proportion of employers indicating they had hired a newly trained pathologist in the last year varied depending on the practice setting, with between 45% and 68% of employers indicating they had not hired a recent graduate in the last year. As shown in Table 8, whereas 55% of academic employers indicated they had hired a recent graduate in the last year, only 32% of other employers had done so. Most employers reported that the average number of pathologists applying for open positions in the last year was between 1 and 10. There was little difference in the numbers of applicants that employers reported on the basis of practice setting.

Table 7. Response of Newly Hired Pathologists to, "Why Do You Think You Were Offered the Position?"

Response Category	Percentage of Respondents	Sample Responses
Academic background or training	29	<ul style="list-style-type: none"> ● "Strong training at well-recognized program . . ." ● "Track record in residency . . ." ● "My program has a formidable reputation . . ." ● "Solid residency training . . ." ● "I have a PhD"
Fellowship	26	<ul style="list-style-type: none"> ● "My fellowship training made me marketable" ● "My GI pathology fellowship . . ." ● "Dermatopathology Fellowship from Ivy League University" ● "Fellowship with expert in the field . . ."
Subspecialty	20	<ul style="list-style-type: none"> ● "Subspecialty training which I am doing most of the time at work" ● "Subspecialty board" ● "I have skills of both surgpath and a subspecialty" ● "Two years of subspecialty training and experience at my current hospital"
Personality or attitudinal characteristic	18	<ul style="list-style-type: none"> ● "Good personality . . ." ● ". . . I am energetic, a team player" ● ". . . enthusiasm and energy" ● "Personable, likable and hard-working"
Recommendation	13	<ul style="list-style-type: none"> ● "Good letter of reference" ● ". . . recommendations from other pathologists" ● ". . . strong letters of recommendation from my mentors . . ."
Interpersonal skills	13	<ul style="list-style-type: none"> ● "People skills . . ." ● ". . . able to communicate/interact with people . . ." ● "Good communication skills . . ."

Academic employers tended to indicate that it took them longer to fill open positions than other types of employers. A total of 35% of other employers indicated it took them 3 months or fewer to fill their open positions, compared with only 19% of academic employers. Similarly, academic employers were more likely report that it took an average of more than 6 months to fill open positions (45%) than were other employers (28%).

Most recent graduates reported that it took either 1 to 3 months (28%) or 3 to 6 months (28%) to find a job, regardless of the practice setting. Only 18% indicated that it took less than 1 month to find a job, and 25% reported that it took more than 6 months. The majority (68%) of recent graduates indicated that they got their first choice of a job. However, this trend was even stronger among those who indicated they were employed with an academic center/hospital. A total of 80% of respondents indicating they were employed in this type of setting indicated they did get their first choice of job, compared with 61% of those employed in other types of settings. Among those who did not get their first choice of a job, the most commonly cited reasons were geographic/family constraints, the employer selected a more experienced candidate, or there were too many applicants.

Newly trained pathologists' attitudes toward the job market were mixed. Just more than one third (38%) of recently hired graduates either *Strongly Agree* or *Agree* with the statement *There are numerous job opportunities available to new graduates*. Another 35% indicated they were *Neutral*, and 27% *Disagree* or *Strongly Disagree*. Attitudes regarding the availability of fellowship opportunities were more optimistic, with 66% of respondents indicating that they *Agree* or *Strongly Agree* that there are numerous fellowship opportunities available.

Newly trained pathologists reported that employers offered them a variety of forms of relationship to the practice as well as other types of benefits in addition to their salary.

- The largest group (31%) of respondents reported that

they were offered an *Academic faculty position*. Other large groups of respondents were offered a salaried employee position (29%) or a *Potential partnership* (23%). Very few respondents (2%) were offered *Partnerships*.

- Most (85%) of the newly trained pathologists indicated they were offered *Medical insurance* by their employers. Other benefits offered to large groups of newly trained pathologists included *Life/disability insurance* (66%), *Educational time separate from vacation* (59%), and *Paid time off* (57%). *Flexible spending accounts*, *Profit-sharing plans*, and *Flex-time* were offered much less frequently (38%, 20%, and 8%, respectively). While 25% of respondents specified some "other" benefit received (eg, incentive bonus, allowance for Continuing Medical Education or books, malpractice insurance), there was little consistency in the benefits noted.

COMMENT

Results from the employers' survey suggested there are opportunities for improvement with respect to the preparation of job applicants. Ratings of both overall satisfaction with applicants and preparedness of new hires were wide ranging, with a notable proportion of employers providing less favorable ratings. Moreover, nearly one third of employers indicated that new hires had a major deficiency in a critical area. In addition, one half of employers agreed that more guidance and support are needed now for newly trained pathologists than were required 10 years ago.

Employers perceived that new hires generally are better prepared for the general and anatomic aspects of pathology practice than they are for the clinical and administration aspects. On average, employers' ratings of preparedness in specific aspects of general pathology and anatomic pathology ranged from 4.36 to 3.69 on a 5-point scale. In contrast, their ratings in specific aspects of clinical pathology and administration ranged from 3.63 to 2.31 on a 5-point scale.

- Key driver analysis identified four specific aspects of

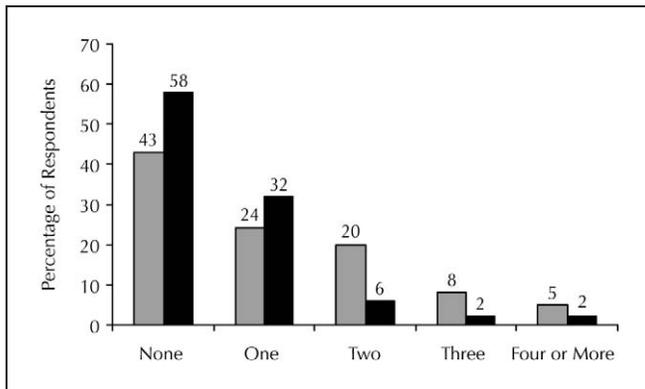


Figure 9. Responses to the question, "Within your practice, how many open positions do you currently have for pathologists?" Gray bar, academic center/hospital; black bar, other practice settings.

practice, as measured by the survey, that had the most impact on employers' overall perceptions of new hire preparedness. Employer perception of new hire preparedness to *Appropriately seeking coworker/senior pathologist consultation on cases* was the biggest influence on overall employer perceptions of new hire preparedness. This also was an area in which employer ratings suggested that they were largely satisfied with new hire preparedness. Other significant factors that had an impact on overall perceptions of new hire preparedness included *Judiciously ordering special studies and stains*, *Laboratory management* (clinical), and *Independent sign-out of surgical cases*. Among the four key drivers, employers rated new hire preparedness as being weakest in the areas of *Judiciously ordering special studies and stains* and *Laboratory management* (clinical).

Academic center/hospital employers provided more favorable ratings of satisfaction with new hire preparedness than employers from other types of settings. Ratings of both overall satisfaction with applicants and preparedness of new hires were higher among academic employers than among other types of employers. In addition, academic employers rated the preparedness of their newly trained hires as being significantly higher than other employers for all four aspects of general pathology as well as in the areas of *Independent sign-out of surgical cases* and *Intraoperative frozen section diagnosis*.

Newly trained pathologists' ratings suggest that they are moderately confident in their abilities as a pathologist; moreover, their perceptions of preparedness in specific aspects align with employer perceptions. An examination of newly trained pathologists' ratings of their abilities suggests that they do not appear to be overly confident in their abilities. In addition, their perceptions of those specific areas in which they are most and least prepared are very similar to the pattern of ratings provided by employers. On average, newly trained pathologists' ratings of their own preparedness were highest for specific aspects of general pathology and anatomic pathology and lowest for specific aspects of clinical pathology and administration.

In selecting new pathologists, employers perceived *Medical knowledge* and *Interpersonal skills* as the most important applicant characteristics. When new employees were asked why they were offered their position, the qualifications cited most often were academic background/training, completion of a fellowship, and subspecialty training.

	Academic Employers, %	Other Employers, %	All Employers, %
Yes	55	32	39
No	45	68	61

The latter topic is a key point in the current debate about pathology training, owing to the return of anatomic pathology/clinical pathology training to 4 years.¹⁰

On the anatomic pathology side, an editorial commentary arising from the 2005 Association of Pathology Chairs meeting speaks to the need for better mentorship of pathology trainees by teaching faculty, including the need for more authentic involvement in clinical decision making.¹⁸ Pathology residents themselves are calling for more authentic experiences through graduated responsibilities in anatomic pathology.^{19,20} Barbara and Alan Ducatman have provided a template for prospective, longitudinal evaluation of competencies in surgical pathology.²¹ Remarkably, the humble hematoxylin-eosin-stained tissue slide remains the cornerstone of the practice of anatomic pathology, and the ability of pathologists—young and old—to interpret such slides is the starting point for the remarkable set of competencies enjoyed by our specialty.^{22,23} The emphatic declaration by employers that newly hired pathologists must have the necessary skills for independent signout of surgical pathology cases reminds us that the bedrock of anatomic pathology remains the morphologic interpretation of case material.

In clinical pathology, deficiencies in management training are being emphasized, along with recommendations for reform.^{24,25} Mechanisms for assessing resident competencies in laboratory medicine have been published.²⁶ However, there are calls for radical rethinking of pathology residency training and education,²⁷ including reshaping the underappreciated stereotype of the pathologist (whether deserved or not¹³) and improving the role of pathology in the medical center.^{28,29} Over and above the obvious need for resident core training in new technologies, especially molecular pathology,³⁰ specific recommendations are being made for pathology residency training in informatics^{13,28,31–34} and clinical laboratory management.³⁵ Comment has been made that the late appearance of recommendations for anatomic pathology and clinical pathology training over and above those specified by the ACGME is attributed to the forces of political discord, inertia, and undue reliance on the ACGME.³⁶ Again, it is hoped that the results of this survey instrument will help sharpen the discussion.

This survey did quantify the interest of potential employers on fellowship training after pathology residency as a prerequisite to procuring a position in the job market. This expectation is also documented in Dr Richard Horowitz's 2006 survey report.⁵ Evaluating the impact of this important trend is beyond the scope of this publication. Debate over both the appropriate amount and content of fellowship training, especially in the non-ACGME-accredited subspecialty fellowships, will be left for others. Likewise, discussion of how to meld training in anatomic pathology, molecular diagnostic pathology, cytogenetics, bioinformatics, and clinical laboratory management into the traditional split of anatomic pathology and clinical pa-

thology training also will be left to others.¹³ That being said, our findings of new expectations are echoed in Dr Richard Horowitz's 2006 report of his third survey,⁵ in which he also documented that there are new expectations for knowledge in molecular pathology and laboratory management (such as quality assurance). Nevertheless, essentials he documented for anatomic pathology competence also were considered to be: surgical pathology diagnosis, frozen section diagnosis, gross dissection, cytology, and fine-needle aspiration. Essentials for clinical pathology included knowledge of both clinical medicine and test strategies that use the laboratory for clinical problem solving. Common with this survey is Dr Horowitz's documentation that skill in communication and interpersonal relations are considered mainstays of being a successful pathologist and remain a major deficiency of the fledgling pathologist.

The Residency In-Service Examination (RISE), administered annually to all pathology residents in training through the American Society for Clinical Pathology, now includes a job survey as a required set of questions. In 2006, there was 100% capture of this information from test participants. Hence, we anticipate that valuable new information also will be coming from this source in the near future.

For our part, there will be value in repeating this survey of both employers and recent pathology graduates at regular intervals (yet to be determined). Each of these survey instruments provides valuable independent information. Our overarching goal is to assist in promoting the continued strength and advancement of the specialty of pathology. We hold as a fundamental premise that the practice of pathology is central to the delivery of quality patient care. Our ability to train future practitioners of pathology will have a major influence on how successfully we fulfill this premise.

This survey arose out of discussions at Future of Pathology meetings convened by the CAP in November 2004, March 2005, and July 2005. Participating organizations in the Future of Pathology meetings were CAP (host organization and administrator of survey), 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. The full survey instrument and responses can be found as supplementary material at <http://www.zoomerang.com/web/sharedResults/sharedResultsPasswordPage.aspx?ID=L22CJ5HZUETK> (for the employer survey) and <http://www.zoomerang.com/web/sharedResults/sharedResultsPasswordPage.aspx?ID=L22CJ4H8CU6E> (for the new hire survey). Thanks are given to Rebecca Fulcer, PhD, and Ann Neumann, PhD, of the Education Division of CAP, for preparing the survey and compiling the results data.

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