

## A Description of Physician Assistant Postgraduate Residency Training: The Resident's Perspective

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***Purpose:** Postgraduate residency training is an optional form of education that has existed within the physician assistant profession since 1971. Despite almost three decades of experience, there are no comprehensive data regarding PA residents' opinions about their residency training. At the time of this study, there were 17 residency programs in 10 different states. This study was undertaken to characterize PA residency training in the United States from the perspective of participants. **Methods:** This study utilizes a non-experimental, descriptive research design to describe residents' perspectives of various characteristics, activities and opinions regarding PA postgraduate residency training. Data were collected from a survey instrument reviewed by a select group of residency directors for design and clarity. Standard procedures for gaining approval and clearance for studies involving human subjects were followed. Forty-six (59%) of the 78 enrolled residents responded. Data were entered into a relational database. Descriptive statistical analyses utilized a standard statistical software package. **Results:** Results from the survey data collected from the PA residents are reported. Data are categorized as follows: resident demographic information, entry-level PA program information, pre-residency program information, residency program information, residency curriculum data, residents' perceptions of changes in knowledge and skills and residents' opinions regarding residency. **Conclusions:** PA postgraduate residency education provides an important educational vehicle for training graduate PAs in specialty care. A substantial proportion of residents proceed directly from entry-level to postgraduate training. Residents report satisfaction with their programs generally and specifically in terms of knowledge and skills acquired. More information comparing the differences between academic and internship models of residency education is needed as is consideration of greater standardization in program record-keeping and support for research into the longitudinal outcomes associated with postgraduate education.*

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### Introduction

Physician assistant residency education has developed in response to a perceived need for standardization of

education beyond the entry level and for increased specialty training.<sup>1,2</sup> If the PA profession follows the pattern of physicians and several other health-care professions, postgraduate residency education may become an expectation for practitioners.

The role of the PA has expanded dramatically over the past 30 years. Today PAs are practicing medicine with substantial autonomy in virtually every specialty area of medicine.<sup>3,4</sup> Increased autonomy and specialization have resulted in a need for practical, postgraduate, specialty education. To date, most PAs accomplish specialty education through extensive on-the-job training with one-on-one education from physicians practicing the specialty.<sup>3</sup> The trend towards increas-

ing specialization and autonomy has led greater numbers of PAs to seek formal postgraduate training prior to entering the specialty of their choice or transferring from one specialty to another.

There are two basic types of PA postgraduate residency programs: internship and academic model programs.<sup>5</sup> Internship model programs include a modest, practically oriented, didactic curriculum combined with intensive clinical rotations and educational experiences. They lead to a certificate of completion. Academic model programs combine a highly structured and formalized didactic education (through courses taken for graduate credit) with clinical rotations and lead to a master's degree (or credit towards

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a master's degree) upon completion. Because of the different foci of these two models of residency programs, this study reports findings by these two categories as appropriate for identifying important differences between them.

### *Purpose*

This study reports findings from the second in a two-part comprehensive study inventorying PA postgraduate residency programs. The first part, "A Description of Physician Assistant Postgraduate Residency Training: The Director's Perspective,"<sup>5</sup> inventoried residency programs from information provided by program directors. This study, conducted contemporaneously in May 1998 with the first, sought information from currently enrolled, postgraduate residents about their backgrounds, professional history, and opinions regarding the value of their training. This study does not rely or build upon either existing descriptive information or on well-formulated educational theory as its foundation. Instead, its purpose is to develop an initial inventory of baseline information about PA postgraduate residency training as described by PA residents enrolled at the time of this study.

### *Methods*

A survey instrument requesting information about residents' backgrounds and experiences was developed and reviewed by a select group of PA residents and residency directors to identify problems of design and clarity. The study employed a non-experimental, descriptive research design. It utilized a questionnaire to ask residents about their various characteristics, backgrounds, activities, and opinions regarding PA postgraduate residency training. Approval for the study was sought from the professional organization representing postgraduate residency programs the Association of Postgraduate Physician Assistant Programs (APPAP). APPAP endorsed

this study at its general membership meeting in May 1997.

In May 1998, surveys were sent to residency program directors for distribution to all their enrolled residents. The surveys were accompanied by a cover letter signed by the study author and co-signed by the president of APPAP. To provide residents with some measure of confidentiality in reporting unfavorable comments and to add to the integrity of responses, each resident received an envelope in which to seal and, thereby, secure the completed survey prior to returning it to the program director. After one month, residency directors who had not returned surveys from currently enrolled residents were contacted. Problems identified through this procedure were addressed and assistance in completing the surveys was provided as appropriate. The method of administering the survey via the program directors was utilized with the assumption that the directors could more effectively coordinate the distribution and collection of the survey from busy residents and thus improve the response rate.

The method of administering the surveys for residents resulted in some limitations in response rates. In the companion study, 16 of the 17 directors of postgraduate residency programs returned their inventories. Of these 16, only 14 directors returned surveys collected from residents enrolled in their programs. The two programs that returned information from directors, but not from residents, enrolled six residents. Of the 14 programs that did return surveys from their residents, 46 (64%) of the residents (n=72) enrolled in May 1998 completed inventories. These responses comprise the database for the information about residents' perspectives on their postgraduate programs in this analysis.

Data collected from the survey were entered into a relational database. This allowed the data to be categorized based upon various residency characteristics. In addition, descriptive statistical analysis was conducted utilizing a standard statistical software package. Data analy-

sis generally consists of summary statistics for each parameter reported.

### *Results*

Findings are presented in the following general categories: demographics, information about entry-level PA program, pre-residency information, program selection and enrollment, program curriculum, and opinions about residency training. When appropriate, findings are subcategorized into respondents in internship and academic model programs. A total of 46 surveys were returned. Occasionally, respondents did not complete all fields of the questionnaire and thus the identified number of responses for the data will vary.

#### **Resident Demographic Information**

Currently enrolled residents were almost evenly divided between males (n=23, 51%) and females (n=22, 49%). Respondents (n=44) were predominantly white (86%) with the remainder being African-American (14%). No other ethnic identity was represented in this group of respondents. The mean age reported was 34.4 years (n=44, SD=8.4, range 24-57).

#### **Entry-Level PA Program Information**

As presented in Table 1, 45 (98%) of the residents provided the name of their entry-level PA program. The most commonly reported entry-level PA programs attended were Alderson-Broaddus College, George Washington University, University of Southern California, and Western Michigan University.

Residents were asked what credential(s) they were awarded from their entry-level PA program. More than one choice could be selected. All respondents (n=46) indicated being awarded at least one credential from their entry-level PA program. Seven (15%) received two credentials, typically a certificate and an academic degree. Table 2 describes the frequency and types of these credentials.

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Table 1

## Entry-Level PA Program Attended by Residents

Entry-Level PA Program Attended	# of Residents	Percent of Total
Alderson-Broadus College	4	8.9
George Washington University	4	8.9
University of Southern California	4	8.9
Western Michigan University	4	8.9
Duke University	2	4.4
Midwestern University	2	4.4
St. Francis College	2	4.4
All Other PA Programs	23	51.1
Total	45	99.9*

\* Total less than 100% due to rounding off of individual percentages

Table 2

## Entry-Level PA Program Credential Awarded

Entry-Level PA Program Credential	Number	Percent
Certificate Only	11	20.8
Associate's Degree	3	5.6
Bachelor's Degree	28	52.8
Master's Degree	11	20.8
Other	0	0
Total	53	100

### Pre-Residency Information

PAs often have experience in the health-care sector prior to enrolling in entry-level PA training programs. Thirty-seven (82%) of the residents (n=45) responding to this question reported an average of 57.2 months (SD=58.7, range 6-240) of such experience prior to their initial PA training.

Residents were asked about the total number of months they had spent in practice as PAs prior to entering their residency program. Eighteen (39%) of the residents (n=46) reported having practiced as a PA prior to entering residency while 28 (61%) had no practice experience. Residents with PA experience averaged 50.7 months (SD = 60.7, range = 1-209) in practice.

The 18 residents who indicated prior practice as a PA were asked about their area of specialty practice. Fourteen (78%) residents provided a response. Nearly two-thirds of the respondents were practicing the specialty of family medicine just prior to entering the resi-

dency program. Table 3 describes the specialty practice of the 14 responses to this question.

### Residency Program Selection and Enrollment Information

Residents were asked how they became aware of the PA residencies. Respondents were instructed to select a single response from a menu of choices. Table 4 summarizes answers to this question. The most commonly reported mechanism for learning about the resi-

dency programs was information provided by the entry-level PA program the resident attended.

Residents were then asked to rank-order the items that influenced their decision to attend a PA residency. The most commonly reported item influencing the resident's decision to pursue residency training was the ability to compete for a job in this specialty (89.1%). Interest in additional clinical knowledge and skills prior to going into practice as a PA (84.4%) and improved future earning potential (80.4%) were also reported by more than two-thirds of the respondents. Interestingly, 60.9% of residents identified obtaining an advanced degree as an item influencing their decision to attend a residency, yet only three of the 17 residency programs in existence at the time of this survey offered a master's degree upon completion. Table 5 summarizes residents' responses.

Information was gathered about the number of residency programs to which residents had applied, been interviewed, and accepted. Thirty-nine (84.7%) respondents (n=46) applied to a single residency program; five (10.9%), to two residency programs; one (2.2%), to three; and one (2.2%), to four residency programs. In terms of interviews prior to admission, 42 (91.3%) interviewed with one program and the remainder (4) with two. Forty-three (93.5%) residents were accepted by one postgraduate program and three, by two. Table 6 provides an overview of these findings.

Residents were asked to rank-order factors influencing their decision to attend their specific residency program

Table 3

## Specialty Practiced as a PA Prior to Residency

Specialty Prior to Residency	N	Percent of Total
Family Practice	9	64.3
Emergency Medicine	2	14.3
Internal Medicine	1	7.1
Internal Medicine Specialty	1	7.1
Occupational Health	1	7.1
Total	14	99.9*

\* Total less than 100% due to rounding off of individual percentages

Table 4

**Mechanism by Which Residents Learned About PA Residency**

Mechanism	N	Percent
Information provided to me by the PA program I attended	19	41.3
From a fellow student or colleague	12	26.1
Journal advertisements	4	8.7
Other	4	8.7
By interactions with a residency graduate	3	6.5
By a mailing sent to me	2	4.3
Web site	1	2.2
Journal article about the residency	1	2.2
Total	46	100

Table 5

**Items Influencing Residents' Decision to Attend a Residency**

Item	Frequency of Selection	Percent	Rank Order
Increased ability to compete for a job in this specialty	41/46	89.1	1
Interest in additional clinical knowledge and skills prior to going into practice as a PA	39/46	84.8	2
Improved future earning potential	37/46	80.4	3
Current level of competency in this specialty area	34/46	73.9	4
Provides flexibility to change specialty area practiced	28/46	60.9	5
Obtaining an advanced degree	28/46	60.9	5
Other	4/46	8.7	7

Table 6

**Summary of Admissions Characteristics of the Enrolled Residents (N=46)**

Admissions Activity	Number of Programs Indicated by Enrolled Residents				
	1	2	3	4	Total
Applied to	84.7%	10.9%	2.2%	2.2%	100%
Interviewed at	91.3%	8.7%	0%	0%	100%
Received acceptance to	93.5%	6.5%	0%	0%	100%

programs. The following summaries describe residents' estimates of their allocation of effort in these component areas of postgraduate education.

Residents estimated the total number of hours of formal didactic curriculum included in their residency program to be 369.6 hours (SD=212.9, range=40-1000). When program model differences were examined, residents (n=14) attending an academic model residency program estimated spending an average of 413.4 hours (SD=117.2, range=150-795) in didactic curriculum. Those (n=32) in internship model programs estimated spending 350.4 hours (SD=226.7, range=40-1000).

Residents were then asked to estimate the average number of clinical hours related to patient care spent per week in their residency program. Those enrolled in academic model programs estimated spending approximately 44.1 hours weekly (SD=6.5, range=36-60) in patient care. Internship model program residents estimated spending approximately 72.3 hours (SD=28.1, range=28-150) in clinical care per week on average. This is an average difference of 28 additional hours weekly spent in clinical care between program models. (Author note: It is worth noting that the internship respondents varied widely in their estimates of the total hours spent in patient care activities (28-150). While it is logistically possible for a resident to spend 150 hours per week in patient care, it is highly improbable that this is an accurate reflection. It seems reasonable to conclude that some residents' perceptions of hours worked per week may be overstated in their survey responses.)

Residents next estimated the average number of hours per week spent in educational activities related to patient care (reading texts, journals, studying). Residents in academic model programs estimated that on average they spent nearly 8 additional hours per week (average=16.1 hours, SD=14.5, range=4-60) on educational activities when compared to the internship model residents (average=8.4 hours, SD=4, range=2-20).

and to leave blank those items not influencing their decision. Table 7 provides a summary of these findings. Program reputation and the didactic component of the curriculum were the most commonly reported items. Salary stipend, the benefits package, and "other" were the only categories identified by less than 50% of respondents.

All residents identified the specialty of the residency program they attended. Table 8 summarizes this information.

Residents provided information about the length of their training programs. The mean length of all residency programs is 15.7 months (SD=4.8, range=12-24). Thirty-five (76%) of

the residents attended internship model programs with a mean length of 13.2 months (SD=2.2, range=12-25). Eleven (24%) residents were enrolled in academic model programs with a mean length of 23.5 months (SD=1.2, range=21-24).

**Program Curriculum Information**

Residents were asked to provide information regarding the number of hours of 1) formal didactic curriculum, 2) clinical contact with patients, 3) educational activities relating to patient care, and 4) participation in research-related activities during their residency

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Table 7

Items Influencing Residents' Decision to Attend Their Residency

Item	Frequency of Selection	Percent	Rank Order
Program reputation	36/46	78.3	1
Didactic component of curriculum	36/46	78.3	1
Practical clinical education component	31/46	67.4	3
Geographic location	30/46	65.2	4
Recommendation from colleague or friend	26/46	56.5	5
Degree or degree option offered	25/46	54.3	6
Recommendation from PA program faculty member	24/46	52.2	7
Impression obtained during application/interview process	24/46	52.2	7
Salary stipend	20/46	43.5	9
Benefits package	15/46	32.6	10
Other	9/46	19.6	11

Table 8

Percentage of Respondents by Specialty

Residency Specialty	Frequency	Percent
Surgery	15	32.6
Emergency Medicine	10	21.7
Primary Care	6	13.0
Orthopedics	5	10.9
Internal Medicine	4	8.7
Pediatrics	2	4.3
CVT Surgery	1	2.2
Dermatology	1	2.2
Obstetrics and Gynecology	1	2.2
Occupational Health	1	2.2
Total	46	100

Finally, residents were asked to estimate the total number of hours spent participating in research-related activities and research-related education during their program. Those attending academic model residency programs estimated that they received (on average) approximately 186 additional hours of research-related education (average=215.7 hours, SD=155.4, range=0-500) more than residents in the internship model programs (average=29.4 hours, SD=40.2, range=0-150).

Residents were then asked a series of questions about program operations in several important areas. They were questioned about interdisciplinary exposure to other health professionals during their residency program. Each resident identified other health professionals in training from a list including physician residents,

medical students, PA students, dentists, nurse practitioners, pharmacists, and others. Space was provided to specify other groups of health professionals. The most commonly reported health professionals for PA residents to be trained with are PA students (73.9%), followed by physician residents (63%) and medical students (54.3%). The uncommonly reported professions included dentists (17.3%), nurse practitioners (17.3%), and pharmacists (6.5%). Other health professionals (6.5%) encountered in training programs included physical therapists and nursing students.

Table 9 summarizes responses from residents who were asked to specify the different health professionals responsible for supervising their clinical work during their residency program. The list of choices for health professionals

included physician residents, staff physicians, PA residency program staff, staff PAs, and others, again with a space to specify other health-care professionals. The mean number of different types of supervisory health professionals was 2.1 (SD=1.0, range=1-4). PA residents were typically supervised by staff physicians (95.7%). Three residents identified other supervisory health professionals, specifically community physician preceptors.

Residents were then asked how their performance was evaluated in their residency program. Each resident selected methods from a list that included 1) written evaluations from rotation preceptors, 2) written evaluations from the PA residency staff, 3) verbal evaluations from rotation preceptors, 4) written clinical examinations, 5) practical clinical examinations, and 6) other with space to specify the specific other evaluation method. A summary of these responses is presented in Table 10.

## Residents' Opinions About Training Programs

Residents were asked their perceptions about program benefits through a series of questions requiring them to compare their pre- and post-program learning in several areas.

First, each resident assessed changes in his or her knowledge about clinical activities (beyond their entry-level education) as a result of their residency training. Table 11 summarizes these findings. Each clinical activity is listed first with the complete breakdown by percentage and then by categories col-

Table 9

Summary of Resident's Clinical Supervisors (N=46)

Health Professional	Percent	Rank
Staff Physicians	95.7	1
Staff Physician Assistants	56.3	2
Physician Residents	39.1	3
PA Residency Program Staff	32.6	4
Other	6.5	5

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Table 10

Summary of Evaluation Methods (N=46)

Evaluation Method	Percent	Rank
Written evaluations from rotation preceptors	60.9	1
Verbal evaluations from rotation preceptors,	50.0	2
Written evaluations from the PA residency staff	34.8	3
Written clinical examinations	34.8	3
Other	4.3	5
Practical clinical examinations	2.2	6

Table 11

Residents' Perceptions of Change in Knowledge of Clinical Activities (N=44)

Clinical Activity	Percent		
	Unchanged	Increased	Greatly Increased
History taking and interviewing skills	29.5	36.4	34.1
Unchanged versus increased	29.5		70.5
Physical examination skills	20.5	50.0	29.5
Unchanged versus increased	20.5		79.5
Ability to develop a differential diagnosis	4.5	36.4	59.1
Unchanged versus increased	4.5		95.5
Ability to establish a diagnosis	2.3	36.4	61.2
Unchanged versus increased	2.3		97.6
Procedural and technical skills	20.5	29.5	50.0
Unchanged versus increased	20.5		79.5
Interpreting laboratory and diagnostic data	11.4	59.1	29.5
Unchanged versus increased	11.4		88.6
Research skills	52.3	25.0	22.7
Unchanged versus increased	52.3		47.7
Critical thinking skills	4.5	45.5	50.0
Unchanged versus increased	4.5		95.5
Appropriate referral and consultation	18.2	50.0	31.8
Unchanged versus increased	18.2		81.8
Ability to recognize disease and pathology	4.5	45.5	50.0
Unchanged versus increased	4.5		95.5

interview skills (21.7%), and physical examination skills (19.6%).

Table 13 presents findings about residents' levels of satisfaction with various aspects of their training. It also combines the data on satisfaction into high and low categories for broader comparisons.

All residents reported satisfaction in their summary evaluation of their residency training experience and substantial satisfaction in the areas of degree of responsibility, didactic and clinical education. Residents were least satisfied with the salary and benefits packages. When asked if they would recommend their residency program to other PAs interested in their specialty, 33 (71.7%) answered 'definitely' and 13 (28.3%), 'probably.' None replied that they would not recommend their training program.

### Study Limitations

This study was designed as a descriptive inventory utilizing a survey instrument to collect data about residents' perceptions of their postgraduate PA programs. Survey research methodologies have limitations applicable to this study. First, descriptive studies are not designed for hypothesis testing or identifying causal relationships but rather to inventory and classify. The present study is exploratory. It is limited to an initial systematic description of various elements of residency education.

Further, studies utilizing survey methodology are susceptible to errors caused by the participants' imperfect memory, by limited accuracy in observation, by problems of record-keeping, and by the respondents' desire to give what they believe to be acceptable or desired responses. Response rates less than 100% are a common problem associated with questionnaires, especially those administered via mail. Respondents' motivations may directly influence the validity and reliability of the collected data. Further, because these surveys are administered at a single point in time, they reflect only a

lapsed into two: increased and unchanged. Forty-four (95.7%) of the 46 residents provided usable responses to this item.

In decreasing order of frequency, the clinical activities in which the residents identified increased knowledge with the greatest frequency were ability to establish a diagnosis (97.6%), ability to recognize disease and pathology (95.5%), critical thinking skills (95.5%), and ability to develop a differential diagnosis (95.5%). Clinical activities they most commonly identified as unchanged included research skills (52.3%), history taking and interview skills (29.5%), physical examination skills (20.5%), and procedural skills (20.5%).

Next, residents assessed changes in their skills (beyond their entry-level education) resulting from their residency training. Using the same format as Table 11, Table 12 presents these findings both for each item and in combined categories.

The clinical skills where residents identified the greatest growth in their skills were ability to develop a differential diagnosis (100.0%), ability to recognize disease and pathology (100.0%), critical thinking skills (97.8%), and ability to establish a diagnosis (95.5%). The clinical skills that residents most commonly identified as unchanged included research skills (54.4%), history taking and

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**Table 12**  
**Residents' Perceptions of Change in Their Clinical Skills (N=46)**

Clinical Activity	Percent		
	Unchanged	Increased	Greatly Increased
History taking and interviewing skills	21.7	45.7	32.6
Unchanged versus increased	21.7		78.3
Physical examination skills	19.6	45.6	34.8
Unchanged versus increased	19.6		80.4
Ability to develop a differential diagnosis	0.0	47.8	52.2
Unchanged versus increased	0.0		100.0
Ability to establish a diagnosis	4.3	41.3	54.4
Unchanged versus increased	4.3		95.7
Procedural and technical skills	17.4	23.9	58.7
Unchanged versus increased	17.4		82.6
Interpreting laboratory and diagnostic data	10.9	52.2	36.9
Unchanged versus increased	10.9		89.1
Research skills	54.4	23.9	21.7
Unchanged versus increased	54.4		45.6
Critical thinking skills	2.2	45.6	52.2
Unchanged versus increased	2.2		97.8
Appropriate referral and consultation	17.4	54.4	28.2
Unchanged versus increased	17.4		82.6
Ability to recognize disease and pathology	0.0	58.7	41.3
Unchanged versus increased	0.0		100.0

**Table 13**  
**Summary of Residents' Satisfaction Levels**

Educational Experience	Very High	High	Low	Very Low
Clinical supervision received	15=32.6%	24=52.2%	6=13%	1=2.2%
• high versus low satisfaction	High=84.8%		Low=15.2%	
Degree of responsibility	19=43.2%	24=54.5%	1=2.3%	0=0%
• high versus low satisfaction	High=97.7%		Low=2.3%	
Degree of autonomy	14=31.8%	22=50.0%	8=18.2%	0=0%
• high versus low satisfaction	High=81.8%		Low=18.2%	
Salary or stipend	3=7.3%	20=48.8%	14=34.1%	4=9.8%
• high versus low satisfaction	High=56.1%		Low=43.9%	
Benefits package	10=24.4%	17=44.7%	7=18.4%	4=10.5%
• high versus low satisfaction	High=69.1%		Low=28.9%	
Didactic education	15=32.6%	25=54.4%	3=6.5%	3=6.5%
• high versus low satisfaction	High=87.0%		Low=13.0%	
Clinical education	16=35.6%	23=51.1%	3=6.7%	3=6.7%
• high versus low satisfaction	High=86.7%		Low=13.4%	
Overall residency training	16=34.8%	30=65.2%	0=0%	0=0%
• high versus low satisfaction	High=100%		Low=0.0%	

single reference point and do not provide any indication of how the findings may change over time (trends).

Issues unique to this particular study also may be identified. The programs in this study have not been previously surveyed or reviewed. Thus,

there are no existing data that can be used for purposes of direct comparison. The survey instruments were uniquely developed for this study and had not been specifically tested for reliability and validity. Moreover, completing the questionnaire required a substantial

commitment of time by residents. Finally, PA residents may seek to portray their respective programs positively and present opinion-oriented information only in a favorable manner.

## Conclusions

Several educators have called for greater standardization of the postgraduate residency education process.<sup>1,6,7</sup> Nevertheless, except for the development of the academic model programs, PA residency education continues to exist in much the same format as it did approximately twenty years ago. To date, PA postgraduate residency training programs have not objectively documented their value, standardized their curricula, legitimized their educational processes and outcomes through research, or implemented an accreditation and/or certification process for postgraduate education.

Nonetheless, the information collected from residents does provide an initial characterization of demographics, motivations, and program operation as well as some evaluation of programs from the residents' perspective. This study provides evidence that, although most PA residents had substantial experience in health care, in 1998 almost three-fifths of PA residents had matriculated directly from their entry-level training into postgraduate programs. Two-thirds reported having learned about residency options during entry-level programs both from information distributed by those programs and from fellow students. Certainly residents felt that residency education increased their knowledge, competence, and ability to compete for more desirable positions. While these findings are suggestive, it is not yet clear whether entry-level programs are beginning to emphasize the value of additional training. Likewise it is not yet clear whether an expectation for postgraduate credentials (as experienced in other health-care professions) may be developing; this question is beyond the design of this survey.

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The survey describes residents' self-assessments of the effects of a residency program on their knowledge and skills. Generally, residents reported substantial gains. These included both clinical activities and skills where residents most frequently identified increases in their abilities to establish a diagnosis, to recognize disease and pathology, think critically, and to develop a differential diagnosis. Fewer gains were reported in activities and skills related to areas of research, history taking and interviewing, physical examination, and procedures.

PA residents appear to be quite satisfied with their residency programs and training generally and with most specific aspects related to their education. The economics of residency education were more problematic, although this item was not fully developed in the survey instrument. All residents indicated that they would recommend their residency to other PAs interested in the same specialty.

This study, in combination with the previously published data gathered from program directors, serves as a starting point and baseline for comprehensively describing and assessing postgraduate residency education for PAs. However, the results raise many questions yet to be answered. For example, although there is minimal overlap in the information gathered in this study with that in the survey of program

directors, some inconsistencies may be identified. These occur when residents estimate the portion of their program devoted to the didactic curriculum as compared with information provided by program directors.<sup>5</sup> Residents both overestimated (internship model programs) and underestimated (academic model programs) the hours devoted to instruction by their programs. Similar discrepancies were identified in minority enrollments.

Educators, policymakers, employers, and members of the profession still have relatively little systematic information on which to formulate opinions regarding and make judgments about the value of PA postgraduate residency education programs. The data presented in this study provide an initial inventory of information about these pioneering programs from the perspective of one cohort of enrollees. In their view, residency education appears to be contributing to their professional knowledge and development. A next step would be a study to identify long-term outcomes of postgraduate education and compare and contrast these outcomes to those of on-the-job training.

Postgraduate residency education is now well established and may grow in popularity over the next several years. The PA profession should take a more active interest in this form of education and work with the residency programs to develop more systematically their

postgraduate education system to serve the interests of all stakeholders broadly. Better record-keeping and careful evaluation of programs, as well as outcomes of programs and graduates, would be an important starting point.

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