

## ORIGINAL RESEARCH

## Learning Needs of Physician Assistants Working in Hospital Medicine

Haruka Torok, MD, MSc\*, Christina Lackner, PA-C, MBA, Regina Landis, BA, Scott Wright, MD

*Division of Hospital Medicine, Johns Hopkins Bayview Medical Center, Johns Hopkins University School of Medicine, Baltimore, Maryland.*

**BACKGROUND:** Hospital Medicine is growing rapidly, and the number of physician assistants (PAs) in this field is expected to grow. However, there is no available data related to the learning needs of PA hospitalists.

**OBJECTIVE:** To conduct a needs assessment for PA hospitalists who may be embarking on a hospitalist career.

**DESIGN:** Cross-sectional survey based on the Core Competencies in Hospital Medicine.

**SETTING/PARTICIPANTS:** A sample of hospitalist PAs working in the United States.

**MEASUREMENTS:** Amount of experience with core diagnoses and procedures, preferences for additional training that would have prepared them to function as hospitalist PAs.

**RESULTS:** Sixty-nine PAs responded (response rate, 67%). Among the core clinical conditions, respondents had the most experience in managing diabetes and urinary tract

infections and were least experienced with health care-associated pneumonias and sepsis syndrome. Over 90% rarely performed core competency procedures other than electrocardiogram and chest X-ray interpretations. The top 3 content areas that PA hospitalists believed would have helped to better prepare them to care for inpatients were palliative care (percent of PAs who agreed or strongly agreed: 85%), nutrition for hospitalized patients (84%), and consultations (64%). Almost all (91%) indicated that they would have been interested in formal postgraduate hospital medicine training even if it meant having a lower stipend during the first year on the job.

**CONCLUSIONS:** This is the first national data on self-perceived learning needs of PA hospitalists. The results may prove helpful for both PAs entering hospitalist careers and for the physician groups looking to hire them. *Journal of Hospital Medicine* 2012;7:190–194. © 2011 Society of Hospital Medicine

Physician assistants (PA) have rapidly become an integral component in the United States health care delivery system, including in the field of Hospital Medicine, the fastest growing medical field in the United States.<sup>1,2</sup> Since its induction in 1997, hospitalist providers in North America have increased by 30-fold.<sup>3</sup> Correlating with this, the number of PAs practicing in the field of hospital medicine has also increased greatly in recent years. According to the American Academy of Physician Assistants (AAPA) census reports, Hospital Medicine first appeared as one of the specialty choices in the 2006 census (response rate, 33% of all individuals eligible to practice as PAs) when it was selected as the primary specialty by 239 PAs (1.1% of respondents). In the 2008 report (response rate, 35%), the number grew to 421 (1.7%) PAs.<sup>2</sup>

PA training programs emphasize primary care and offer limited exposure to inpatient medicine. After PA

students complete their first 12 months of training in didactic coursework that teach the basic sciences, they typically spend the next year on clinical rotations, largely rooted in outpatient care.<sup>2,4</sup> Upon graduation, PAs do not have to pursue postgraduate training before beginning to practice in their preferred specialty areas. Thus, a majority of PAs going into specialty areas are trained on the job. This is not an exception in the field of hospital medicine.

In recent years, despite an increase in the number of PAs in Hospital Medicine, some medical centers have chosen to phase out the use of midlevel hospitalist providers (including PAs) with the purposeful decision to not hire new midlevel providers.<sup>5</sup> The rationale for this strategy is that there is thought to be a steep learning curve that requires much time to overcome before these providers feel comfortable across the breadth of clinical cases. Before they become experienced and confident in caring for a highly complex heterogeneous patient population, they cannot operate autonomously and are not a cost-effective alternative to physicians. The complexities associated with practicing in this field were clarified in 2006 when the Society of Hospital Medicine identified 51 core competencies in hospital medicine.<sup>3,6</sup> Some hospitalist programs are willing to provide their PAs with on-the-job training, but many programs do not have the educational expertise or the resources to make this happen. Structured and focused postgraduate training

\*Address for correspondence and reprint requests: Haruka Torok, MD, MSc, Johns Hopkins University School of Medicine, Johns Hopkins Bayview Medical Center, 5200 Eastern Avenue, MFL Building West Tower 6F CIMS Suite, Baltimore, MD 21224; Tel.: 410-550-5018; E-mail: htorok1@jhmi.edu

Additional Supporting Information may be found in the online version of this article.

Received: April 28, 2011; Revised: September 14, 2011; Accepted: October 16, 2011

2011 Society of Hospital Medicine DOI 10.1002/jhm.1001

Published online in Wiley Online Library (Wileyonlinelibrary.com).

in hospital medicine seems like a reasonable solution to prepare newly graduating PAs that are interested in pursuing hospitalist careers, but such opportunities are very limited.<sup>7</sup>

To date, there is no available information about the learning needs of PAs working in hospital medicine settings. We hypothesized that understanding the learning needs of PA hospitalists would inform the development of more effective and efficient training programs. We studied PAs with experience working in hospital medicine to (1) identify self-perceived gaps in their skills and knowledge upon starting their hospitalist careers and (2) understand their views about optimal training for careers in hospital medicine.

## METHODS

### Study Design

We conducted a cross-sectional survey of a convenience sample of self-identified PAs working in adult Hospital Medicine. The survey was distributed using an electronic survey program.

### Participants

The subjects for the survey were identified through the Facebook group “PAs in Hospital Medicine,” which had 133 members as of July 2010. This source was selected because it was the most comprehensive list of self-identified hospitalist PAs. Additionally, the group allowed us to send individualized invitations to complete the survey along with subsequent reminder messages to nonresponders. Subjects were eligible to participate if they were PAs with experience working in hospital medicine settings taking care of adult internal medicine inpatients.

### Survey Instrument

The survey instrument was developed based on the Core Competencies in Hospital Medicine with the goal of identifying PA hospitalists’ knowledge and skill gaps that were present when they started their hospitalist career.

In one section, respondents were asked about content areas among the Core Competencies in Hospital Medicine that they believed would have enhanced their effectiveness in practicing hospital medicine had they had additional training before starting their work as hospitalists. Response options ranged from Strongly Agree to Strongly Disagree. Because there were content areas that seemed more relevant to physicians, through rigorous discussions, our study team (including a hospitalist physician, senior hospitalist PA, two curriculum development experts, one medical education research expert, and an experienced hospital medicine research assistant) selected topics that were felt to be particularly germane to PA hospitalists. The relevance of this content to PA hospitalists was confirmed through pilot testing of the instrument. Another series of questions asked the PAs about their

views on formal postgraduate training programs. The subjects were also queried about the frequency with which they performed various procedures (using the following scale: Never, Rarely [1-2/year], Regularly [1-2/month], Often [1-2/week]) and whether they felt it was necessary for PAs to have procedure skills listed as part of the Core Competencies in Hospital Medicine (using the following scale: Not necessary, Preferable, Essential). Finally, the survey included a question about the PAs’ preferred learning methods by asking the degree of helpfulness on various approaches (using the following scale: Not at all, Little, Some, A lot, Tremendously). Demographic information was also collected. The instrument was pilot-tested for clarity on the 9 PA hospitalists who were affiliated with our hospitalist service, and the instrument was iteratively revised based on their feedback.

### Data Collection and Analysis

Between September and December 2010, the survey invitations were sent as Facebook messages to the 133 members of the Facebook group “PAs in Hospital Medicine.” Sixteen members could not be contacted because their account setup did not allow us to send messages, and 14 were excluded because they were non-PA members. In order to maximize participation, up to 4 reminder messages were sent to the 103 targeted PAs. The survey results were analyzed using Stata 11. Descriptive statistics were used to characterize the responses.

This study protocol was approved by the institution’s review board.

## RESULTS

Sixty-nine PAs responded (response rate, 67%). Table 1 provides demographic characteristics of the respondents. The majority of respondents were 26–35 years old and had worked as hospitalists for a mean of 4.3 years.

### Clinical Conditions

Table 2 shows the respondents’ experience with 19 core competency clinical conditions before beginning their careers as hospitalist PAs. They reported having most experience in managing diabetes and urinary tract infections, and least experience in managing healthcare associated pneumonias and sepsis syndrome.

### Procedures

Most PA hospitalists (67%) perform electrocardiograms and chest X-ray interpretations regularly (more than 1-2/ week). However, nearly all PA hospitalists never or rarely (less than 1-2/year) perform any invasive procedures, including arthrocentesis (98%), lumbar puncture (100%), paracentesis (91%), thoracentesis (98%), central line placement (91%), peripherally inserted central catheter placement (91%), and peripheral intravenous insertion (91%). Despite the infrequency of execution, more than 50% of respondents

**TABLE 1.** Characteristics of the 62 Physician Assistant Respondents Who Elected to Share Demographic and Personal Information

Characteristics*	Value†
Age, years, n (%)	
<26	1 (2)
26–30	16 (29)
31–35	14 (25)
36–40	10 (18)
41–45	5 (9)
>45	10 (18)
Women, n (%)	35 (63)
Year of graduation from PA school, mode ( ±SD)	2002 ( ±7)
No. of years working/worked as hospitalist, mean ( ±SD)	4.3 ( ±3.4)
Completed any postgraduate training program, n (%)	0 (0)
Hospitalist was the first PA job, n (%)	30 (49)
Salary, US\$, n (%)	
50,001–70,000	1 (2)
70,001–90,000	32 (57)
>90,000	23 (41)
Location of hospital, n (%)	
Urban	35 (57)
Suburban	21 (34)
Rural	5 (8)
Hospital characteristics, n (%)	
Academic medical center	25 (41)
Community teaching hospital	20 (33)
Community nonteaching hospital	16 (26)
Responsibilities in addition to taking care of inpatients on medicine floor, n (%)	
Care for patients in ICU	22 (35)
Perform inpatient consultations	31 (50)
See outpatients	11 (18)

Abbreviations: ICU, intensive care unit; PA, physician assistant; SD, standard deviation. \*Seven PAs did not provide any personal or demographic information. †Because of missing data, numbers may not correspond to the exact percentages.

explained that it is either preferable or essential to be able to perform these procedures.

### Content Knowledge

The PA hospitalists indicated which content areas may have allowed them to be more successful had they learned the material before starting their hospitalist career (Table 3). The top 4 topics that PA hospitalists believed would have helped them most to care for inpatients were palliative care (85% agreed or strongly agreed), nutrition for hospitalized patients (84%), performing consultations in the hospital (64%), and prevention of health care–associated infection (61%).

### Professional Growth as Hospitalist Providers

PAs judged working with physician preceptors (mean ± SD, 4.5 ± 0.6) and discussing patients with consultants (mean ± SD, 4.3 ± 0.8) to be most helpful for their professional growth, whereas receiving feedback/audits about their performance (mean ± SD, 3.5 ± 1), attending conferences/lectures (mean ± SD, 3.6 ± 0.7), and reading journals/textbooks (mean ± SD, 3.6 ± 0.8) were rated as being less useful. Respondents believed that the mean number of months required for new hospitalist PAs to become fully competent team members was 11 months (± 8.6 SD). Forty-three percent of

**TABLE 2.** Physician Assistant Experiences with 19 Core Clinical Conditions Before Starting Career in Hospital Medicine

Clinical Condition	Mean (±SD)*
Urinary tract infection	4.5 (0.8)
Diabetes mellitus	4.5 (0.8)
Asthma	4.4 (0.9)
Community-acquired pneumonia	4.3 (0.9)
Chronic obstructive pulmonary disease	4.3 (1.0)
Cellulitis	4.2 (0.9)
Congestive heart failure	4.1 (1.0)
Cardiac arrhythmia	3.9 (1.1)
Delirium and dementia	3.8 (1.1)
Acute coronary syndrome	3.8 (1.2)
Acute renal failure	3.8 (1.1)
Gastrointestinal bleed	3.7 (1.1)
Venous thromboembolism	3.7 (1.2)
Pain management	3.7 (1.2)
Perioperative medicine	3.6 (1.4)
Stroke	3.5 (1.2)
Alcohol and drug withdrawal	3.4 (1.1)
Sepsis syndrome	3.3 (1.1)
Hospital-acquired pneumonia	3.2 (1.1)

Abbreviation: SD, standard deviation. \*Likert scale: 1, no experience, I knew nothing about this condition; 2, no experience, I had heard/read about this condition; 3, I had experience caring for 1 patient (simulated or real) with this condition; 4, I had experience caring for 2–5 patients with this condition; 5, I had experience caring for many (>5) patients with this condition.

respondents shared the perspective that some clinical experience in an inpatient setting was an essential prerequisite for entry into a hospitalist position. Although more than half (58%) felt that completion of postgraduate training program in hospital medicine was not necessary as a prerequisite, almost all (91%) explained that they would have been interested in such a program even if it meant having a lower stipend than a hospitalist PA salary during the first year on the job (Table 4).

**TABLE 3.** Content Areas that 62 Respondent PAs Believed Would Have Enhanced Their Effectiveness in Practicing Hospital Medicine Had They Had Additional Training Before Starting Their Work as Hospitalists

Health Care System Topics	PAs Who Agreed or Strongly Agreed, n (%)
Palliative care	47 (85)
Nutrition for hospitalized patients	46 (84)
Performing consultations in hospital	35 (64)
Prevention of health care–associated infections	34 (62)
Diagnostic decision-making processes	32 (58)
Patient handoff and transitions of care	31 (56)
Evidence-based medicine	28 (51)
Communication with patients and families	27 (49)
Drug safety and drug interactions	27 (49)
Team approach and multidisciplinary care	26 (48)
Patient safety and quality improvement processes	25 (45)
Care of elderly patients	24 (44)
Medical ethics	22 (40)
Patient education	20 (36)
Care of uninsured or underinsured patients	18 (33)

**TABLE 4.** Self-Reported Interest from 55 Respondents in Postgraduate Hospitalist Training Depending on Varying Levels of Incentives and Disincentives

Interest in Training	n (%)
Interested and willing to pay tuition	1 (2)
Interested even if there was no stipend, as long as I didn't have to pay any additional tuition	3 (5)
Interested ONLY if a stipend of at least 25% of a hospitalist PA salary was offered	4 (7)
Interested ONLY if a stipend of at least 50% of a hospitalist PA salary was offered	21 (38)
Interested ONLY if a stipend of at least 75% of a hospitalist PA salary was offered	21 (38)
Interested ONLY if 100% of a hospitalist PA salary was offered	4 (7)
Not interested under any circumstances	1 (2)

## DISCUSSION

Our survey addresses a wide range of topics related to PA hospitalists' learning needs including their experience with the Core Competencies in Hospital Medicine and their views on the benefits of PA training following graduation. Although self-efficacy is not assessed, our study revealed that PAs who are choosing hospitalist careers have limited prior clinical experience treating many medical conditions that are managed in inpatient settings, such as sepsis syndrome. This inexperience with commonly seen clinical conditions, such as sepsis, wherein following guidelines can both reduce costs and improve outcomes, is problematic. More experience and training with such conditions would almost certainly reduce variability, improve skills, and augment confidence. These observed variations in experience in caring for conditions that often prompt admission to the hospital among PAs starting their hospitalist careers emphasizes the need to be learner-centered when training PAs, so as to provide tailored guidance and oversight.

Only a few other empiric research articles have focused on PA hospitalists. One article described a postgraduate training program for PAs in hospital medicine that was launched in 2008. The curriculum was developed based on the Core Competencies in Hospital Medicine, and the authors explained that after 12 months of training, their first graduate functioned at the level of a PA with 4 years of experience under her belt.<sup>7</sup> Several articles describe experiences using midlevel providers (including PAs) in general surgery, primary care medicine, cardiology, emergency medicine, critical care, pediatrics, and hospital medicine settings.<sup>5,8-20</sup> Many of these articles reported favorable results showing that using midlevel providers was either superior or just as effective in terms of cost and quality measures to physician-only models. Many of these papers alluded to the ways in which PAs have enabled graduate medical education training programs to comply with residents' duty-hour restrictions. A recent analysis that compared outcomes related to inpatient care provided by a hospitalist-PA model versus a traditional resident-based model

revealed a slightly longer length of stay on the PA team but similar charges, readmission rates, and mortality.<sup>19</sup> Yet another paper revealed that patients admitted to a residents' service, compared with the nonteaching hospitalist service that uses PAs and nurse practitioners, were different, having higher comorbidity burdens and higher acuity diagnoses.<sup>20</sup> The authors suggested that this variance might be explained by the difference in their training, abilities, and goals of the groups. There was no research article that sought to capture the perspectives of practicing hospitalist PAs.

Our study revealed that although half of respondents became hospitalists immediately after graduating from PA school, a majority agreed that additional clinical training in inpatient settings would have been welcomed and helpful. This study's results reveal that although there is a fair amount of perceived interest in postgraduate training programs in hospital medicine, there are very few training opportunities for PAs in hospital medicine.<sup>7,21</sup> The American Academy of Physician Assistants, the Society of Hospital Medicine, and the American Academy of Nurse Practitioners cosponsor Adult Hospital Medicine Boot Camp for PAs and nurse practitioners annually to facilitate knowledge acquisition, but this course is truly an orientation rather than a comprehensive training program.<sup>22</sup> Our findings suggest that more rigorous and thorough training in hospital medicine would be valued and appreciated by PA hospitalists.

Several limitations of this study should be considered. First, our survey respondents may not represent the entire spectrum of practicing PA hospitalists. However, the demographic data of 421 PAs who indicated their specialty as hospital medicine in the 2008 National Physician Assistants Census Report were not dissimilar from our informants; 65% were women, and their mean number of years in hospital medicine was 3.9 years.<sup>2</sup> Second, our study sample was small. It was difficult to identify a national sample of hospitalist PAs, and we had to resort to a creative use of social media to find a national sample. Third, the study relied exclusively on self-report, and since we asked about their perceived learning needs when they started working as hospitalists, recall bias cannot be excluded. However, the questions addressing attitudes and beliefs can only be ascertained from the informants themselves. That said, the input from hospitalist physicians about training needs for the PAs who they are supervising would have strengthened the reliability of the data, but this was not possible given the sampling strategy that we elected to use. Finally, our survey instrument was developed based on the Core Competencies in Hospital Medicine, which is a blueprint to develop standardized curricula for teaching hospital medicine in medical school, postgraduate training programs (ie, residency, fellowship), and continuing medical education programs. It is not clear

whether the same competencies should be expected of PA hospitalists who may have different job descriptions from physician hospitalists.

In conclusion, we present the first national data on self-perceived learning needs of PAs working in hospital medicine settings. This study collates the perceptions of PAs working in hospital medicine and highlights the fact that training in PA school does not adequately prepare them to care for hospitalized patients. Hospitalist groups may use this study's findings to coach and instruct newly hired or inexperienced hospitalist PAs, particularly until postgraduate training opportunities become more prevalent. PA schools may consider the results of this study for modifying their curricula in hopes of emphasizing the clinical content that may be most relevant for a proportion of their graduates.

### Acknowledgements

The authors would like to thank Drs. David Kern and Belinda Chen at Johns Hopkins Bayview Medical Center for their assistance in developing the survey instrument.

Financial support: This study was supported by the Linda Brandt Research Award program of the Association of Postgraduate PA Programs. Dr. Wright is a Miller-Coulson Family Scholar and was supported through the Johns Hopkins Center for Innovative Medicine.

Disclosures: Dr. Torok and Ms. Lackner received a Linda Brandt Research Award from the Association of Postgraduate PA Programs for support of this study. Dr. Wright is a Miller-Coulson Family Scholar and is supported through the Johns Hopkins Center for Innovative Medicine.

### References

1. United States Department of Labor, Bureau of Labor Statistics. Available at: <http://www.bls.gov>. Accessed February 16, 2011.
2. American Academy of Physician Assistants. Available at: <http://www.aapa.org>. Accessed April 20, 2011.
3. Society of Hospital Medicine. Available at: <http://www.hospitalmedicine.org>. Accessed January 24, 2011.
4. Accreditation Review Commission on Education for the Physician Assistants Accreditation Standards. Available at: [http://www.arc-pa.org/acc\\_standards](http://www.arc-pa.org/acc_standards). Accessed February 16, 2011.
5. Parekh VI, Roy CL. Non-physician providers in hospital medicine: not so fast. *J Hosp Med*. 2010;5(2):103–106.
6. Dressler DD, Pistoria MJ, Budnitz TL, McKean SC, Amin AN. Core competencies in hospital medicine: development and methodology. *J Hosp Med*. 2006;1:48–56.
7. Will KK, Budavari AL, Wilkens JA, Mishark K, Hartsell ZC. A hospitalist postgraduate training program for physician assistants. *J Hosp Med*. 2010;5:94–98.
8. Resnick AS, Todd BA, Mullen JL, Morris JB. How do surgical residents and non-physician practitioners play together in the sandbox? *Curr Surg*. 2006;63:155–164.
9. Victorino GP, Organ CH. Physician assistant influence on surgery residents. *Arch Surg*. 2003;138:971–976.
10. Buch KE, Genovese MY, Conigliaro JL, et al. Non-physician practitioners' overall enhancement to a surgical resident's experience. *J Surg Educ*. 2008;65:50–53.
11. Roblin DW, Howard DH, Becker ER, Kathleen Adams E, Roberts MH. Use of midlevel practitioners to achieve labor cost savings in the primary care practice of an MCO. *Health Serv Res*. 2004;39:607–626.
12. Grzybicki DM, Sullivan PJ, Oppy JM, Bethke AM, Raab SS. The economic benefit for family/general medicine practices employing physician assistants. *Am J Manag Care*. 2002;8:613–620.
13. Kaissi A, Kralewski J, Dowd B. Financial and organizational factors affecting the employment of nurse practitioners and physician assistants in medical group practices. *J Ambul Care Manage*. 2003;26:209–216.
14. Nishimura RA, Linderbaum JA, Naessens JM, Spurrier B, Koch MB, Gaines KA. A nonresident cardiovascular inpatient service improves residents' experiences in an academic medical center: a new model to meet the challenges of the new millennium. *Acad Med*. 2004;79:426–431.
15. Kleinpell RM, Ely EW, Grabenkort R. Nurse practitioners and physician assistants in the intensive care unit: an evidence-based review. *Crit Care Med*. 2008;36:2888–2897.
16. Carter AJ, Chochinov AH. A systematic review of the impact of nurse practitioners on cost, quality of care, satisfaction and wait times in the emergency department. *CJEM*. 2007;9:286–295.
17. Mathur M, Rampersad A, Howard K, Goldman GM. Physician assistants as physician extenders in the pediatric intensive care unit setting—a 5-year experience. *Pediatr Crit Care Med*. 2005;6:14–19.
18. Abrass CK, Ballweg R, Gilshannon M, Coombs JB. A process for reducing workload and enhancing residents' education at an academic medical center. *Acad Med*. 2001;76:798–805.
19. Singh S, Fletcher KE, Schapira MM, et al. A comparison of outcomes of general medical inpatient care provided by a hospitalist-physician assistant model vs a traditional resident-based model. *J Hosp Med*. 2011;6:112–130.
20. O'Connor AB, Lang VJ, Lurie SJ, et al. The effect of nonteaching services on the distribution of inpatient cases for internal medicine residents. *Acad Med*. 2009;84:220–225.
21. Association of Postgraduate PA Programs. Available at: <http://aapa.org/Home/tabid/38/Default.aspx>. Accessed February 16, 2011.
22. Adult Hospital Medicine Boot Camp for PAs and NPs. Available at: <http://www.aapa.org/component/content/article/23—general-/673-adult-hospital-medicine-boot-camp-for-pas-and-nps>. Accessed February 16, 2011.