

ORIGINAL RESEARCH

Nurse Practitioner and Physician Assistant Scope of Practice in 118 Acute Care Hospitals

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BACKGROUND: Advanced practice providers (APPs), including nurse practitioners (NPs) and physician assistants (PAs) are cost-effective substitutes for physicians, with similar outcomes in primary care and surgery. However, little is understood about APP roles in inpatient medicine.

OBJECTIVE: Describe APPs role in inpatient medicine.

DESIGN: Observational cross-sectional cohort study.

SETTING: One hundred twenty-four Veterans Health Administration (VHA) hospitals.

PARTICIPANTS: Chiefs of medicine (COMs) and nurse managers.

MEASUREMENTS: Surveys included inpatient medicine scope of practice for APPs and perceived healthcare quality. We conducted bivariate unadjusted and multivariable adjusted analyses.

RESULTS: One hundred eighteen COMs (95.2%) and 198 nurse managers (75.0%) completed surveys. Of 118 medicine services, 56 (47.5%) employed APPs; 27 (48.2%) used

NPs only, 15 (26.8%) PAs only, and 14 (25.0%) used both. Full-time equivalents for NPs was 0.5 to 7 (mean = 2.22) and PAs was 1 to 9 (mean = 2.23). Daily caseload was similar at 4 to 10 patients (mean = 6.5 patients). There were few significant differences between tasks. The presence of APPs was not associated with patient or nurse manager satisfaction. Presence of NPs was associated with greater overall inpatient and discharge coordination ratings by COMs and nurse managers, respectively; the presence of PAs was associated with lower overall inpatient coordination ratings by nurse managers.

CONCLUSIONS: NPs and PAs work on half of VHA inpatient medicine services with broad, yet similar, scopes of practice. There were few differences between their roles and perceptions of care. Given their very different background, regulation, and reimbursement, this has implications for inpatient medicine services that plan to hire NPs or PAs. *Journal of Hospital Medicine* 2014;9:615–620. © 2014 Society of Hospital Medicine

Nurse practitioners (NPs) and physician assistants (PAs) provide healthcare in numerous environments internationally and in the United States.^{1,2} However, their role in the inpatient medicine setting is not well described.² In the United States, there are more than 157,000 NPs and 85,000 PAs with projected increases.^{3,4} Although both professions provide direct medical care, there are key differences.^{1,3–5} NPs typically complete a master's or doctoral degree with advanced clinical training beyond nursing. PAs complete at least 2 years of college courses similar to pre-medical school requirements. PA programs use a

medical school-based curriculum and train for about 2 years before awarding a master's degree. NPs are regulated through state nursing boards, whereas PAs are regulated through state licensing or medical boards. NPs and PAs have different, yet overlapping scopes of practice. A key difference is that PAs can only practice collaborating with a physician.^{5,6} Overall, both have been shown to provide healthcare that is similar in quality to physicians in specific primary care and surgical settings.²

NPs and PAs, often referred to as advanced practice providers (APPs), are employed primarily in outpatient clinic settings providing direct patient care. Most APP studies have focused on the outpatient setting, despite nearly a third of US healthcare expenditure for hospital care.^{2,7} Little is known about APP involvement, specific roles, or impact on outcomes in inpatient medicine settings where they are often referred to as NP or PA “hospitalists.”^{2,8–10}

The Veterans Health Administration (VHA) is 1 of the largest employers of APPs, with 3.6% of all NPs and 2.1% of all PAs reported to practice in the

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VHA.^{11–13} As the largest fully integrated healthcare system in the US, the VHA had 8.8 million veterans enrolled and 703,500 inpatient admissions in 2012.¹⁴ Although this makes the VHA an ideal environment to study the role of APPs, few studies have done so.^{13,15–19} Although studies have compared NPs and PAs to physicians, very little is known about how NPs differ from PAs when practicing in the same environment.

Our objective was to describe the scope of practice, defined as activities that an individual healthcare practitioner is licensed to perform, of NPs and PAs in the inpatient medicine setting and in the VHA. A secondary objective was to explore important outcomes that could potentially be affected by the presence of NPs and PAs on inpatient medicine.

METHODS

The Organizational Factors and Inpatient Medical Care Quality and Efficiency (OFIM) study provides a basis for this study with detail published elsewhere.²⁰ The OFIM study was conducted between 2010 and 2011 to evaluate quality of care in VHA inpatient medicine surveying chiefs of medicine (COM), inpatient medicine nurse managers (NM), attending physicians, and extant VHA survey data. The COM is the senior attending physician in charge of departments of medicine that include most medical subspecialties within the VHA medical centers. We used the subset of questions specific to NPs and PAs from the COM and NM surveys. Both COMs and NMs answered identical questions for NPs and PAs in 2 separate sections to avoid overlap of responses. NM survey responses were only used for the coordination of care regression model. Surveys were conducted by e-mail with up to 4 reminders and a subsequent paper mailing. The "inpatient medicine service" included adult general internal medicine, medical subspecialties, and critical care. The study was approved by the institutional review boards of the VA Boston Healthcare System, the University of Iowa, and the Iowa City VA Healthcare System.

Measurements

To create our primary variable of interest—NP and PA employment—we used the COM survey. Respondents indicated the number and full-time employee equivalent (FTEE) values for APPs on inpatient medicine. Based on responses, we created a categorical variable with 4 options: (1) facilities with NPs only, (2) facilities with PAs only, (3) facilities with both NPs and PAs, and (4) facilities with neither NPs nor PAs. We selected 3 outcomes that could potentially be affected by the presence of NPs and PAs on inpatient medicine: patient satisfaction, registered nurse (RN) satisfaction, and coordination of care. Patient satisfaction has been shown to improve with NPs and PAs in prior studies, and improving coordination of care has been a stated goal of medical centers in hiring NPs

and PAs.^{2,9} Based on our personal experience and previous studies that have shown that nurses report better communication with NPs than physicians,²¹ and that NPs retain a visible nursing component in their NP role,²² we hypothesized that nurse satisfaction on inpatient medicine would improve with the presence of NPs and PAs.

Patient satisfaction was obtained from the 2010 VHA Survey of Healthcare Experiences of Patients (SHEP).²³ The average response rate was 45%. Approximately half the questions on the SHEP are identical to the Hospital Consumer Assessment of Healthcare Providers and Systems survey (HCAHPS).²⁴ We examined 2 items: an overall rating and willingness to recommend the facility. For the overall rating, patients rated their hospitalization on a scale from 0 (worst hospital possible) to 10 (best hospital possible). Following HCAHPS guidelines, responses of either 9 or 10 were coded as positive and all other nonmissing responses were coded 0. For willingness to recommend, patients were asked "Would you recommend this hospital to your friends and family?" using a 4-point response scale. Responses of definitely and probably "no" were coded as 0, and probably and definitely "yes" were coded as 1.

Nurse satisfaction was obtained from the 2011 Veterans Administration Nursing Outcomes Database, an annual survey of VHA nurses that includes demographic, work environment and satisfaction data.²⁵ The survey, a modified version of the Practice Environment Scale,²⁶ had a response rate of 52.9% (out of 51,870). For this analysis, we selected only inpatient medicine RNs. We used 2 measures: overall job satisfaction and collegial RN/MD (physician) relations. The former was assessed using the item "Compared to what you think it should be, what is your current overall level of satisfaction with your job?" The RN/MD relations scale had 3 items, including "Physicians and nurses have good working relationships." Both items were evaluated on a similar 5-point response scale.

Coordination of care was assessed from COM and NM surveys. Overall coordination was evaluated from the COM survey using 1 of 8 items in a question about care coordination, "In the past month, how would you rate the following aspects of coordination of patient care – inpatient coordination overall." Overall coordination was also evaluated from the NM survey using a similar item. Discharge coordination was evaluated only from the NM survey using 1 of 8 items, "Thinking about your experiences during the past month, how would you rate the following aspects of the coordination of patient care related to the discharge process on your inpatient medicine unit – discharge coordination overall." When a service had more than 1 response from the NM survey, we took an average of responses to represent the mean score. Responses for all questions ranged from 1 for poor to 5 for excellent (for all of the questions see Supporting Information, Appendix 1, in the online version of this article).

TABLE 1. Nurse Practitioner and Physician Assistant Hospital-Based Scopes of Practice

	Services With NPs,	Services With PAs,	P Value
How do NPs and PAs function in conjunction with inpatient medicine staff (attending) physicians in the day-to-day care of patients (ie, scope of practice)?	N = 39 (%) [†]	N = 26 (%) [†]	
Autonomously, in a manner similar to physicians	10 (25.6%)	5 (19.2%)	0.77
Somewhat autonomously, but with limitations	13 (33.3%)	12 (46.2%)	0.31
In a role closer to a ward assistant	9 (23.1%)	8 (30.8%)	0.57
Administrative	2 (5.1%)	0 (0.0%)	0.51
Other	6 (15.4%)	1 (3.8%)	0.23
What types of tasks do NPs and PAs perform?	N = 41 (%) [*]	N = 28 (%) [*]	
Write orders	34 (82.9%)	26 (92.9%)	0.29
Coordinate discharge plans	33 (80.5%)	26 (92.9%)	0.18
Communicate with consultants	33 (80.5%)	24 (85.7%)	0.75
History and physicals	31 (75.6%)	25 (89.3%)	0.22
Daily progress notes	31 (75.6%)	24 (85.7%)	0.37
Communicate with primary care providers	31 (75.6%)	20 (71.4%)	0.78
Work directly with hospitalists	26 (63.4%)	23 (82.1%)	0.18
Committees	16 (39.0%)	16 (57.1%)	0.15
Champion quality improvement activities	14 (34.1%)	14 (50.0%)	0.22
Teach nonphysician students	10 (24.4%)	14 (50.0%)	0.04
Perform procedures	9 (22.0%)	14 (50.0%)	0.02
Research	1 (2.4%)	1 (3.6%)	1.00
Other	6 (14.6%)	0 (0.0%)	0.04

NOTE: Abbreviations: NPs, nurse practitioners; PAs, physician assistants.

^{*}Of 41 services with NPs, 14 had PAs too. Of 29 services with PAs, 14 had NPs too.

[†]Numbers may vary between items because all respondents may not have answered all items on survey questions. Percentages do not add up to 100% because respondents may have more than 1 response to multiple response questions.

Last, we modeled for several contextual features that could influence outcomes: geographic region as a 4-item categorical variable; teaching affiliation as a dichotomous variable based on whether the hospital was a member of the Council of Teaching Hospitals, urban or rural status, and facility size as a continuous variable using the number of inpatient medicine service beds.

Statistical Analysis

Descriptive bivariate analyses used *t* tests, χ^2 , or 2-tailed Fisher tests when appropriate to compare NP and PA autonomy, tasks, location of care, work schedule, clinical workload, organizational characteristics (ie, academic, urban, facility complexity, inpatient medicine team structure), and performance evaluations.

Next, we examined whether any of the contextual characteristics were associated with use of NPs or PAs using inferential statistics. For patient satisfaction, we developed a hierarchical linear model (HLM) that nested patients within facilities. We controlled for patient age, sex, health status, and length of stay. For nurse satisfaction, individual responses of RNs also were analyzed using the HLM. We controlled for whether the nurse had a leadership position, worked during the daily shift, and job tenure. Ordinary least

squares regression was used to examine the 3 measures of coordination from the COM and NM surveys. All analyses were performed using Stata version 12 (StataCorp, College Station, TX) and SAS version 9.2 (SAS Institute Inc., Cary, NC).

RESULTS

Of 123 inpatient medicine services that we surveyed, we included responses from the COMs of 118 services (response rate 95.2%); 5 responses were incomplete. Across 123 inpatient medicine services, we surveyed 264 nurse managers and received 198 responses (75.0%) from 114 inpatient medicine services. In the only model using NM responses—the care coordination model—104 inpatient medicine services had responses from both COM and NM surveys.

Of 118 VHA inpatient medicine services, 56 (47.5%) had APPs, of which 27 (48.2%) had NPs only, 15 (26.8%) had PAs only, and 14 (25.0%) had both NPs and PAs. FTEEs for NPs ranged from 0.5 to 7 (mean = 2.22) and for PAs from 1 to 9 (mean = 2.23) on the inpatient medicine service per hospital.

There were no significant differences on use of NPs and PAs by teaching affiliation, urban or rural setting, and geography. A significant difference was observed based on bed size ($F[3,109] = 5.13, P < 0.001$); facilities with both NPs and PAs had, on average, a larger number of inpatient beds (mean = 79.0, standard deviation [SD] = 32.3) compared to those without NPs or PAs (mean = 50.1, SD = 29.4) or with PAs only (mean = 44.2, SD = 20.5) using Tukey post hoc analysis.

The most common staffing model used staff (attending) physicians only working directly with APPs (N = 29, 24.6%). Next most common was an academic model with staff physicians, housestaff, and APPs working together in teams (N = 16, 13.4%). For performance evaluations, COMs contributed for both NPs (60.2%) and PAs (56.4%); in fewer cases, COMs completed evaluations of NPs (12.9%) and of PAs (29.0%) without input from other service managers ($P = 0.02$).

Table 1 shows the differences reported by COMs between NPs and PAs scope of practice. Overall, 58.9% of NPs and 65.4% of PAs functioned somewhat or completely autonomously; 23.1% of NPs and 30.8% of PAs worked in a role closer to a ward assistant (eg, work directly with a physician, cowriting orders, and making care decisions with physician oversight). Tasks frequently performed by the majority of NPs and PAs included writing orders (87.9%), coordinating discharge plans (86.7%), communicating with consultants (83.1%), performing history and physicals (82.5%), writing daily progress notes (80.7%), communicating with primary care providers (73.5%), and working directly with hospitalists (72.8%). Less common tasks included serving on committees (46.4%), championing quality improvement

TABLE 2. Nurse Practitioner and Physician Assistant Hospital Location of Care and Workload

	Services With NPs	Services With PAs	P Value
Where do NPs and PAs provide care?	N = 38 (%)*†	N = 28 (%)*†	
Wards	31 (81.6%)	23 (82.1%)	1.00
Step-down unit	8 (21.1%)	7 (25.0%)	0.77
Intensive care unit	6 (15.8%)	6 (21.4%)	0.75
Skilled care units	5 (13.2%)	4 (14.3%)	1.00
Other	1 (2.6%)	2 (7.1%)	0.57
What are NPs and PAs tours of duty?	N = 38 (%)*	N = 28 (%)*	
Weekdays	37 (97.4%)	25 (89.3%)	0.30
Weekends	5 (13.2%)	9 (32.1%)	0.08
Nights	3 (7.9%)	5 (17.9%)	0.27
Federal holidays	3 (7.9%)	9 (32.1%)	0.02
Other	2 (5.3%)	1 (3.6%)	1.00
What is the average clinical workload for NPs and PAs?	N = 37 (%)*	N = 26 (%)*	
Mean no. of patients	6.81	6.18	0.45
N/A	10 (27.0%)	6 (23.1%)	0.56
Other	1 (2.7%)	0 (0.0%)	

NOTE: Abbreviations: N/A, not assigned specific patients; NPs, nurse practitioners; PAs, physician assistants.

*Of 41 services with NPs, 14 had PAs too. Of 29 services with PAs, 14 had NPs too.

†Numbers may vary between items because all respondents may not have answered all items on survey questions. Percentages do not add up to 100% because respondents may have more than 1 response to multiple response questions.

activities (40.6%), and research (2.9%). There were no statistically significant differences between tasks, except for a higher proportion of services reporting PAs rather than NPs performing procedures (50.0% vs 22.0%, $P = 0.02$) and teaching nonphysicians (50.0% vs 24.4%, $P = 0.04$).

Table 2 reports location of practice in the hospital and workload. There were no significant differences in locations where NPs and PAs provided care. Overall, 81.9% of APPs worked in inpatient wards, 23.1% in step-down units, 18.6% in intensive care units, 13.8% in skilled care units, and 4.9% in other locations. In addition, 97.4% of NPs and 89.3% of PAs worked weekdays, whereas only 7.9% of NPs and 17.9% of PAs worked nights. More PAs than NPs worked federal holidays (32.1% vs 7.9%, $P = 0.02$) and weekends (32.1% vs 13.2%, $P = 0.08$). Most NPs and PAs handled a caseload of 4 to 10 patients with a mean of 6.5, with no difference between the 2. The minority, 27.0% of NPs and 23.1% of PAs, were not assigned specific patients.

In multivariable adjusted analyses evaluating the association between patient satisfaction and use of APPs (Table 3), no significant differences were observed for patients' rating of the hospital ($F[3,95] = 0.19$; $P = 0.90$) or willingness to recommend the hospital ($F[3,95] = 0.54$; $P = 0.65$). Similarly, no significant differences were observed based on use of APPs for nurse overall job satisfaction ($F[3,101] = 1.85$; $P = 0.14$) or collegial relations with physicians ($F[3,101] = 0.96$; $P = 0.41$).

COM ratings of overall inpatient coordination were also nonsignificant ($F[3, 100] = 2.01$; $P = 0.12$), but their ratings of coordination were higher in facilities with NPs only than in those without either NPs or PAs ($\beta = 1.63$, $P = 0.08$). Nurse manager ratings of overall inpatient coordination were not associated with APP use ($F[3,91] = 1.24$; $P = 0.30$), but were marginally lower with facilities using only PAs ($\beta = -1.48$; $P = 0.06$). Nurse manager ratings of discharge coordination showed a significant effect for APP use ($F[3,90] = 3.30$; $P = 0.02$) with facilities having NPs only significantly higher than places without either NPs or PAs ($\beta = 1.84$, $P = 0.04$).

DISCUSSION

Little evidence exists regarding the role of APPs in the inpatient medicine setting,² and important deficit concerns in medical knowledge, technical skills, and clinical experience have been raised.^{27,28} These concerns have called into question the appropriateness of involving APPs in the care of medical inpatients with extensive differential diagnoses and complex care requirements.^{27,28} In spite of these concerns, we found widespread use of APPs with almost half of the VHA inpatient medicine services reporting use, which stands in contrast to prior research.^{9,10,22,29–35} APPs practice in a variety of acute and subacute inpatient medicine settings including academic, community, rural, and urban settings without many discernable differences. The spectrum of activities performed by APPs in the VHA is similar to those reported in these inpatient medicine studies, although their scope of practice appears to be much broader than in these few small single academic center studies.^{10,22,29–36} For example, only 11% of hospitalist PAs did procedures in a 2006 Society of Hospital Medicine survey, whereas 50% did in our study.³⁶

Interestingly, we found that VHA NPs and PAs perform very similar tasks with similar caseloads despite differences in their background, training, regulation, reimbursement, and the longstanding observation that “nurse practitioners are not physician assistants.”^{1,3–5} These findings may reflect that APP scope can be more extensive in the VHA. For example, PAs in the VHA practice under federal jurisdiction and can bypass state legislation of scope of practice.¹³ It also may reflect ongoing expansion of the role of APPs in the healthcare system since prior studies.^{33,36}

We did, however, note a few significant differences in NP and PA scope. PAs are twice as likely to perform procedures as NPs in inpatient medicine. It is unclear why PAs may do more procedures, as acute care NPs also are commonly taught and perform similar procedures.³³ We also found that PAs teach nonphysician students twice as often as NPs. This may reflect the deep commitment shown by the VHA to PA education dating back to the 1960s.¹³ Finally, we found that PAs were significantly more likely to work

TABLE 3. Adjusted Regression Model Examining Nurse Practitioner and Physician Assistant Association with Patient Satisfaction, Nurse Satisfaction, and Coordination of Care

	Patient Satisfaction		Nurse Satisfaction		Coordination of Care		
	Overall Rating	Willingness to Recommend	RN Overall Job Satisfaction	RN/MD Relations	Chief of Medicine: Inpatient Coordination	Nurse Manager: Inpatient Coordination	Nurse Manager: Discharge Coordination
Intercept	0.67 (0.14)	-10.20 (0.15)	30.41 (0.13)	20.89 (0.07)	30.78 (0.26)	30.67 (0.24)	30.23 (0.26)
Facilities with NPs only	0.06 (0.10)	0.12 (0.09)	-0.14 (0.09)	-0.02 (0.05)	10.63 (0.91)	0.00 (0.19)	0.42 (0.20)*
Facilities with PAs only	0.06 (0.09)	0.10 (0.11)	0.10 (0.10)	0.06 (0.05)	-10.08 (0.87)	-0.41 (0.22)	-0.36 (0.25)
Facilities with both NPs and PAs	0.02 (0.12)	0.11 (0.130)	-0.17 (0.11)	0.00 (0.00)	0.31 (0.92)	-0.03 (0.27)	-0.21 (0.30)
Facilities with neither NPs nor PAs	—	—	—	—	—	—	—

NOTE: Model shows parameter estimates (standard error). All models adjust for geographic region, teaching hospital affiliation, urban or rural hospital-based setting, and inpatient medicine operating beds. Models for patient satisfaction adjust for patient age, health status, length of stay, and sex. Models for nurse satisfaction adjust for leadership position, working regular schedule, and job tenure. Abbreviations: MD, physician; NPs, nurse practitioners; PAs, physician assistants; RN, registered nurse. * $P < 0.05$.

weekends and federal holidays, a finding that may have implications for inpatient medicine services hiring APPs. Although not statistically significant, PAs, in general, performed more clinically oriented tasks like history and physicals and more often worked directly with hospitalists.

We found no difference in patient satisfaction or nurse satisfaction related to the presence of APPs, consistent with prior studies, where higher levels of satisfaction with APPs are observed in primary care but not hospital settings.^{2,10} However, it is surprising that no differences were observed for nurse satisfaction. NPs traditionally have a nursing focus, which might foster better relationships with nurses.²² Expecting changes in either patient or nurse satisfaction with just the addition of APPs in the inpatient medicine setting without addressing other factors may be unrealistic. Patient satisfaction is a complex amalgam of various factors including patient expectations, socio-demographics, emotional and physical state, quality of care, and physician communication.²⁴ Similarly, nurse satisfaction depends on many factors including job stress, nurse-physician collaboration, autonomy, staffing, and support.³⁷

Finally, we found higher perception of both overall coordination of inpatient care and discharge coordination on services with NPs. A primary reason stated by medical centers to hire APPs is to improve continuity of care.⁹ Prior research has shown better communication and collaboration between nurses, physicians, and NPs on inpatient medicine services.²¹ NPs may feel that coordination of care is a major focus for their profession and may spend more time than physicians on care coordination activities.³⁸ Moreover, their background in both nursing and medicine may better lend itself to coordinating care between disciplines.³⁹ However, we were surprised to find that services with PAs had lower ratings of overall coordination by nurse managers given that care coordination also is a core competency of PA practice and a primary reason for medical centers to employ them.⁹ The lack of a nursing background for PAs and potentially less overall medical experience than NPs possibly may

contribute to this finding. However, our study does not suggest a direct explanation for this finding, and we had no measure of prior clinical experience, and thus it should be an area for further research.

There are a number of limitations to our study. First, findings from the VHA may not be generalizable to other healthcare systems.³⁹ However, VHA inpatient medicine services are, in general, structured similarly to non-VHA settings and are often affiliated with academic medical centers. Further, this is the largest study to our knowledge to look at the specific roles and perceptions of care provided by both NPs and PAs in inpatient medicine. Second, we did not measure other outcomes of care that may be affected by the use of APPs, such as clinical outcomes, process of care measures, or cost-effectiveness, some of which have been shown in small studies to be impacted by APPs in inpatient medicine.^{10,22,29-35} Third, we are unable to attribute causality to our findings and may not have accounted for all the differences between services. Ideally, a randomized controlled trial of APPs in inpatient medicine would be helpful to address these concerns, but no such trials have been conducted. Finally, we did not survey APPs directly, but surveyed the chiefs of their service instead. The chiefs, however, are directly responsible for the scope of practice of all providers on their service and were directly involved in performance evaluations of most of these practitioners.

In conclusion, we found that NPs and PAs, functioning as APP “hospitalists” are more widely used and have a broader scope of practice on inpatient medicine than previously known or appreciated, at least in the VHA. In spite of their different backgrounds, training, regulations, and reimbursements, they appear to have a similar scope of practice with few differences in roles or perceived impact. Their impact on inpatient healthcare should be a subject of future research. In the meantime, inpatient medicine services should factor these findings into their decision making as they rapidly expand the use of APPs to provide better care to their patients and to address challenges in healthcare reform.^{3,27,28,40}

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