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Utilization and Workforce Integration of Physician Assistants

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Utilization and Workforce Integration of Physician Assistants

Abstract

Background: The healthcare field is experiencing rapid growth in the number of advanced practice providers (APPs) with projections that demonstrate that this trend will only continue. Even though the number of APPs is growing, the development of facility-specific APP management infrastructure often grows at a slower pace. Specific policies and procedures on APP utilization and clinical efficiency metrics are lacking. This can lead to deficiencies in the understanding of the education and practice boundaries of APPs.

Objective: Our study aimed to analyze the growth and utilization of physician assistants (PAs) in several hospitals located within Texas Medical Center (TMC) in Houston, Texas. We investigated potential factors influencing PA utilization and professional growth and information on the workflow structure, perceived barriers to the efficient utilization of PAs, and the integration of PAs into clinical teams and practice.

Methods: We used a mixed methods design to investigate the trends of PAs in hospitals within a large urban medical center. Eight clinical managers at eight different TMC institutions were invited to participate in an email survey and qualitative phone interview.

Results: The survey response rate was 62.5% (n=5). Analysis of interviews and survey responses identified five major themes regarding the utilization of the PA within the organizations: 1) the majority of locations employ PAs in team-based workflow structures with the main goal of creating increased access to care, 2) PAs provide an important degree of continuity and consistency for healthcare services, 3) most locations attempted to measure PA clinical efficiency, but struggled in regards to the best methods to do so, 4) hospitals have a favorable trend in retention rates of PAs and offer research opportunities and professional growth resources to their advanced practice providers, and 5) institutions encountered difficulty when it came to optimal billing practices for PAs.

Conclusions: The primary focus of a PA's job responsibility has shifted from providing physician satisfaction to an increased focus on providing quality patient care and increased patient access. PAs help facilitate coordination of care and create a solid foundation for continuity of care. There is a need for an updated method to measure PA clinical efficiency and a need for standardized PA billing practices.

Keywords

advanced practice providers, physician assistants, PA utilization

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Introduction

Healthcare has experienced remarkable growth in the number of physician assistants (PAs) entering the field over the past decade. More than 28,500 PAs joined the healthcare workforce between the years of 2010 and 2015 alone (National Commission on Certification of Physician Assistants, 2016). There is a projected increase in the advanced practice provider pool of approximately 30% over the next ten years (Bureau of Labor Statistics, 2017). Despite this marked increase in the utilization of physician assistants, the integration process and job delineation of physician assistants varies greatly between institutions and even within institutions. The development of standardized policies on how to best incorporate these providers is lacking. The summation of these factors has led to ambiguity regarding the optimal utilization and integration of physician assistants in the rapidly expanding healthcare field.

The growing need for more providers in order to facilitate easier access to care has created an organic movement by institutions to incorporate PAs at their discretion. Research exploring the different utilization methods, integration practices, and performance evaluations is limited. Richard Dehn and colleagues (2017) recently reviewed research on the growth of the PA profession and concluded there is a “need for research to improve understanding of how PAs fit into the healthcare landscape” (p. 39).

Environmental Context

While this is a nationwide matter, Texas Medical Center (TMC) in Houston, Texas, provides an ideal setting for investigating this movement. TMC is the largest medical complex in the world and is home to some of the most recognized medical institutions. When combined, these medical institutions have up to ten million patient encounters per year (Texas Medical Center, 2017).

Purpose of the Study

The purpose of this study is to describe current trends of PA workflow structure, integration, and implementation in five institutions within the Texas Medical Center (TMC) in Houston, Texas. The study aims to: 1) Describe the utilization of physician assistants in various institutions, 2) Investigate the variances between PA scope of practice, professional growth opportunities, management structure, and integration of PAs into the healthcare team, and 3) Provide avenues for future research on the integration and utilization of PAs.

Background and Prior Research

PAs entered the United States workforce in the 1960s. Dehn et al. (2017) describe three primary eras for PAs and research trends within each era. Within the early years of the PA profession (1960s-1980s), research was mostly small descriptive studies focused on defining a PA and evaluating PA clinical performance. The question of cost-effectiveness of employing PAs was also investigated during this time. By the end of the first decade of implementation, PAs were generally found to be competent, valuable providers who could deliver quality care at a lower cost and subsequently became well-accepted within the healthcare community (Dehn et al., 2017).

The second research era (1980s to 2005) concentrated on educational processes for PAs and the spread of PAs into diverse specialties (Dehn et al., 2017). This period saw the establishment and investigation of education models for PAs. In the mid-1990s, PA educational programs switched from granting certificates or undergraduate degrees to awarding graduate level master’s degrees (Dehn et al., 2017). Most notable during this era was the emergence of large-scale surveys of national scope (Dehn et al., 2017); these provided greater insight into the PA profession. Dehn et al. (2017) designate this middle period as the “retrenchment and diversification” years. “Retrenchment” was initiated by the Graduate Medical Education National Advisory Committee’s (GMENAC) prediction in 1980 of a large physician surplus, causing the public to question the necessity of PAs (Dehn et al., 2017). From the release of this report until the early 1990s, there was decreased enrollment in PA education programs, and few new programs were established. After this brief retrenchment period, the

“diversification” years began (Dehn et al., 2017). In 1997, legislation began to allow reimbursement for inpatient PA services. This resulted in diversification of the PA profession from primarily outpatient practices to now include inpatient care, medical subspecialties, and even surgical subspecialties. As the PA profession rapidly diversified, research focused on gathering census data and describing this growth (Dehn et al., 2017).

Dehn et al. (2017) categorize the final research era as the current period from 2005 to present. This period is characterized by greater reliance on PAs in team-based care, and research focuses on clinical role delineation, the use of PAs to address specific care delivery issues within various specialties, and quality outcomes associated with PA care delivery (Dehn et al., 2017). The current trend in PA research reflects the specialization of PAs and attempts to describe the utilization of PAs within these specialties. Nevertheless, while this trend speaks to the need for descriptive studies on PA utilization and integration, the current studies are limited to the specialty on which they speak and are not generalizable. Dehn et al. (2017) stress that “roles, in all medical and surgical specialties, need to be conceptually and operationally defined in relation to other team member roles, and evaluated on the organizational and patient levels” (p. 39). To date, there have been no research studies attempting to describe on a large generalizable scale the variety of role delineations, workflow structures, and integration of PAs within the healthcare workforce.

Methods

This initiative used a mixed method approach employing both a quantitative survey and a qualitative interview of five clinical managers who had PAs on their teams. A content analysis of the participants’ responses identified themes regarding workflow issues.

Procedure

Participants in the study were clinical leaders of PAs in eight different institutions within the Texas Medical Center. An initial survey (see Appendix A) was emailed to eight identified clinical leaders of PAs in eight different institutions to collect quantitative data on the prevalence, usage, and responsibilities of PAs in each institution. A low response rate to the survey prompted the creation of an abbreviated survey (see Appendix B) sent to the same clinical leaders. Five of the eight abbreviated surveys were returned via email. Only responses to the second survey were used and analyzed, and the first survey was discarded. The five respondents who returned the abbreviated survey questionnaire participated in phone interviews.

The authors created a semi-structured interview script that guided the interviewer on topics to be addressed during the phone interviews (see Appendix C) and a data collection spreadsheet to document the interview comments. The same individual interviewed each participant to minimize collection bias. The detailed interview script further minimized bias and standardized discussion themes. All interviews were audio recorded.

Data Analysis

Descriptive statistics were used to analyze the quantitative survey data. Each phone interview was analyzed using a thematic analysis of the interview transcriptions. One investigator transcribed the recorded interviews and then identified key concepts/themes consistent across hospitals. A second investigator reviewed the transcripts and approved the coded themes. All data was de-identified at the time of analysis.

Findings & Themes

Of the 8 hospitals contacted to participate in the survey, 5 institutions agreed to participate. The data presented here consists of responses to the abbreviated survey questionnaire, details that came from the phone interviews, and demographic data about Texas Medical Center that is available on the TMC website. Table 1 lists the hospital size and the approximate number of annual admissions for each of the responding institutions.

Table 1*Hospital Size & Admissions*

Hospital	Bed Size	Annual Admissions
A	600-700 beds	~22,000
B	900-1,000 beds	~40,000
C	600-700 beds	~30,000
D	400-500 beds	~35,000
E	800-900 beds	~25,000

Note. Data derived from hospital websites at time of the study

The abbreviated survey asked participants to indicate the number of PAs working at the facility each year from 2011 to 2016. Table 2 shows how many PAs were at each hospital during those years.

Table 2*Total Number of Credentialed PAs at Participating TMC Facilities*

Hospital	2011	2012	2013	2014	2015	2016
A	4	9	21	28	58	77
B	54	56	62	78	115	102
C	195	210	237	245	298	315
D	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
E	N/A	N/A	N/A	21	24	31

Note. Data not available for every year

Thematic Analysis of Interviews

Five themes emerged from the content analysis of the respondents' phone interviews. The themes are increased access to care, workflow structure, clinical efficiency, professional growth and promotion, and billing obstacles. Each theme is described and analyzed.

Theme 1: Increased Access to Care

Respondents described the primary reason their facility chose to employ physician assistants and rank ordered the importance of three reasons: increased access to care, financial impact, or physician satisfaction. Eighty percent (n=4) of participants revealed that the number one reason their facility employed PAs was to increase access to care for patients.

One participant stated, "Increase access to care is the main reason. It's helped us free up time for attendings to see new patients and also helps us cover shortages". Three respondents stated that PAs had been able to improve access to care after restrictions on resident hours were imposed. For example, one interviewee said, ". . . being the quaternary facility that we were and being a teaching institution, you had limitations that were placed on you regarding the number of patients you saw, plus the hours that the residents were available to see patients." Another respondent stated,

"When we had a problem where our only coverage at night were fellows and residents and interns, we realized that they are way out of their element, and we don't have enough people taking care of patients at night. There's not enough safety and quality. We knew right away that advanced practice providers were going to be the foundation of our nocturnal team."

Theme 2: Workflow Structure (Backbones and Bridges)

Theme 2 emerged from responses that indicated an improvement in communication and workflow that resulted from utilizing PAs. Participants ranked the most common types of workflow structures, with a majority of facilities (n= 4) noting team-based workflow as their most common workflow model and the one-to-one model as the least common. Several participants indicated that team-based workflow models required a better degree of communication within the service. One interviewee remarked,

“. . . a lot of times people [patients] didn't see the difference between our physicians and our PAs . . . they [PAs] could answer the questions and they could also talk on behalf of their attending physicians because they had a very open dialogue with them. It does not mean that they did not go and speak to their physicians . . . they were in constant communication with their physicians.”

Responses regarding types of workflow identified PAs as a vital communication bridge within the team-based models. One respondent said that PAs were “the backbone that kept everything running.” Interviewees described specific aspects of how PAs help with workflow in their service area:

“. . . physicians really look at having a ‘go-to’ person to help take care of the patients, say when they’re in the operating room or out of pocket, and the patients can come and pick up the phone and talk to a PA and figure out what’s going on. Kind of just bridge the gap there.”

“One of the things is that residents come and go. The work that residents do fluctuates and one of the things that PAs do is they give you a solid foundation for which the whole service can fall back on and look to for their leadership.”

“We couldn’t care for patients without them [PAs]. [Our subspecialty] care is very complicated; it has a lot of moving parts. There’s more demand for services than we can accomplish just with physician and nursing staff. . . . essentially, they [PAs] have become the core of how subspecialty care is delivered in this institution. So operationally and logistically, it just isn’t feasible without PAs.”

Respondents identified that a one-to-one workflow model was the least commonly used model among the hospitals represented. However, one respondent felt that one-to-one workflow model was becoming more popular, specifically within surgical subspecialties: “Most surgical services are transitioning to a one-to-one model, [with one PA] working primarily with one physician. . . . in surgery we are probably 75% one-to-one and 25% team based.”

Theme 3: Clinical Efficiency

Table 3 reports respondent ratings of how efficiently they felt PAs were utilized at their institution on a 1-10 scale, with 10 being the most efficient use possible of PAs.

Table 3

PA Clinical Efficiency Rating

Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
5/10	5/10	8/10	6/10	7/10

Note. Efficiency was rated on a 1-10 scale with 10 being the most efficient use of PAs

Measuring Clinical Efficiency. Interviewees identified how their hospital measured the clinical efficiency of PAs by ranking four measures of efficiency in order of significance: work relative value units (wRVUs) generated, number of patients seen, discharge time, and patient satisfaction. Table 4 summarizes outcome measurement rankings for each hospital.

Table 4*Ranking of Efficiency Outcome Measures*

Hospital	Rankings			
	1 (Most Significant)	2	3	4 (Least Significant)
A	wRVUs Generated	# Patients Seen	Patient Satisfaction	Discharge Time
B	wRVUs Generated	# Patients Seen	Discharge Time	Patient Satisfaction
C	wRVUs Generated	# Patients Seen	Patient Satisfaction	Discharge Time
D	wRVUs Generated	# Patients Seen	Discharge Time	Patient Satisfaction
E	Patient Satisfaction	Discharge Time	# Patients Seen	wRVUs Generated

The outcome measurement reported as the most significant regarding evaluating clinical efficiency was the number of wRVUs generated, followed by the number of patients seen (n=4). wRVU generation is a quantitative way to calculate productivity and possible compensation for providers. Although each hospital may have different criteria for what counts as one wRVU, the function of the unit is universal. Interestingly, even though four of the five locations ranked wRVUs as the most significant way to measure clinical efficiency, several leaders alluded to the difficulty in using wRVUs as a measure of PA efficiency. One interviewee captured this difficulty best, “If all your care is shared care, if all the billing goes out under the physician's name, which is based on the combined work of the PA and the nurse practitioner and the physician, those people have RVUs of zero.” However, another respondent noted a positive numerical relationship between wRVU measurement and PA efficiency within a specific department: “We found that the PAs actually increase the RVUs, especially in the emergency center. They [PAs] actually continue to increase the RVUs and impact productivity throughout the [emergency center] department.”

Barriers to Clinical Efficiency. Interviewees ranked a list of barriers to PA practice and to the efficient use of PAs at their facility in order of most significant barrier to least significant: staffing limitations, facility limitations, lack of education on scope of practice, or insufficient financial resources. Table 5 summarizes the findings.

Table 5*Perceived Barriers to Clinical Efficiency of PAs*

Hospital	Rankings			
	1 (Most Significant)	2	3	4 (Least Significant)
A	Staffing Limitations	Education on Scope of Practice	Facility Limitations	Financial Resources
B	Facility Limitations (tied for #1)	Education on Scope of Practice (tied for #1)	Staffing Limitations	Financial Resources
C	Staffing Limitations	Financial Resources	Education on Scope of Practice	Facility Limitations
D	Facility Limitations	Staffing Limitations	Education on Scope of Practice	Financial Resources
E	Facility Limitations	Staffing Limitations	Education on Scope of Practice	Financial Resources

The most significant reported barriers to improving clinical efficiency were facility limitations (n=3) and staffing limitations (n=2). Regarding facility limitations, one respondent noted, “I think we have a long way to go to maximize our uses [of PAs], particularly in the clinic setting. Right now, we have a lack of space, and it’s hard to even find space for PAs to see patients independently.”

Another barrier to clinical efficiency was a lack of knowledge by fellow care team members regarding the PA role. The lack of understanding by other medical providers of the role of a PA and what training PAs receive was not ranked high as a top barrier. However, respondents addressed PA team members’ understanding of the role of the PA in other lines of questioning and described team members’ perceived lack of knowledge or understanding regarding PA training and clinical abilities:

“. . . in some areas you have [PAs] being used very efficiently, because you’ve got a younger population of physicians who understand the role and have worked with them before at other institutions that have been utilizing PAs to their fullest extent, and they see them more as a team member and not as a ‘mid-level.’”

“‘So what does PA training encompass?’ Physicians are asking me this. And honestly, I thought it was a joke, but they’re like, ‘No, I’m serious, what is it?’ So then I’d have to explain it to them. So when your own counterparts, if you will, don’t even know the education or the training that [PAs] are getting, it kind of worries me.”

“. . . people aren’t always educated on all of the things that PAs should be doing or could be doing.”

“Sometimes there’s an education deficit amongst the team about who can do what and what is at the top of their license.”

One hospital listed both facility limitations and lack of education on the scope of practice of the PAs as the top barriers to the efficient use of PAs: “...facility limitations and the education on scope of practice go hand-in-hand, because [leadership and other staff members] are the ones who write the rules and regulations as well as the bylaws.”

Policy Making and Enforcement. Respondents addressed whether their facility had a practice advisory council for their PAs. The term practice advisory council was defined loosely as a council representing any institutional body whose function was related to PAs working at the institution. Two locations did not have a specific advisory council. However, one of these two did have PA representation on multiple councils throughout different departments. The remaining three locations did have practice advisory councils. At one facility, the respondent stated that the practice advisory council was relatively new. It was started six months prior to the interview and was open to all who wanted to come and discuss the role of the PAs at that institution. A different facility required participants to first be nominated in order to join the council, and then run for office.

Interviewees were given a list of roles and responsibilities possibly held by practice advisory councils and asked to rank them in order of most important responsibility to least important: defining the scope of practice and roles of PAs, determining quality and safety across the institution, reviewing the impact of legislation on current practice, and serving as a peer review process. Table 6 summarizes the ranking of practice council responsibilities. Two respondents reported that responsibilities of these councils were to help define the role and scope of practice for PAs and review the impact of legislation on current practice guidelines.

Table 6*Practice Council Roles and Responsibilities*

		Rankings			
Hospital	Council?	1 (Most Important)	2	3	4 (Least Important)
A	Yes	Define Scope of Practice	Determine Quality/ Safety	Serve as Peer Review	Review Legislation Impact
B	Yes	Review Legislation Impact	Define Scope of Practice	Determine Quality/ Safety	Serve as Peer Review
C	No (But PAs represented on multiple committees)	Define Scope of Practice	Determine Quality/ Safety	Review Legislation Impact	Serve as Peer Review
D	No	N/A	N/A	N/A	N/A
E	Yes	Review Legislation Impact	Define Scope of Practice	Determine Quality/ Safety	Serve as Peer Review

Theme 4: Professional Growth and Promotion

Participants' responses to questions regarding orientation process, continuing medical education (CME) credits, research opportunities, and postgraduate PA training programs highlighted the promotional and professional growth opportunities and benefits afforded to PAs at their hospitals.

Orientation Process. On average, each hospital reported an orientation process that was six months in length and often entailed a combination of formal and informal training. One hospital interviewee stated that their orientation period ranged from three to nine months, depending on the experience of the provider:

“Technically, the orientation process, we would see it last anywhere from 6 to 9 months, but mostly we had a solid 3 months where they [PAs] were working with a preceptor, and then, depending upon how well they did, we could extend that . . . Because you may not know if they had experienced all the situations . . . within those first three months, and if they hadn't then we will extend it until we felt that they [the PA] were comfortable, and that we were comfortable.”

Research Opportunities. Interviewees were asked whether research opportunities were available to PAs at their institution, and if so, what percentage of PAs actively take advantage of these opportunities and how many publications PAs produced annually. At every hospital there was the opportunity for PAs to be involved in research. Anywhere from 5% - 80% of PAs at each facility get involved with research projects, with one location having close to 100 publications annually. Table 7 provides reported approximations regarding PA research participation at each facility.

Table 7

PA Participation in Research

Hospital	% of PAs Involved in Research	# of Annual Publications by PAs
A	80%	15-20
B	33%	3-4
C	30-40%	50-100
D	5%	Unknown
E	30-40%	Unknown

Continuing Medical Education. Respondents indicated that each PA at the represented hospitals has access to funding specifically meant for continuing medical education. The amounts ranged from \$1,600 to \$3,000. Along with funding, each hospital offered PAs time off in addition to their regular paid time off to attend conferences in order to maintain the required CME credits. Anywhere from 50-100% of PAs took advantage of the CME funds. Table 8 summarizes the amount of CME funding available to PAs and the percentage of PAs that use the CME funds in some way.

Table 8

Continuing Medical Education Funding and Usage

Hospital	Annual Amount of Funding Offered	% of PAs that Use Part or All of Funding
A	\$2,000	50%
B	\$1,000-\$3,000	95%
C	\$3,000	100%
D	\$1,600	100%
E	\$3,000	70%

Postgraduate Education Programs. Three interviewees reported that their hospital had post graduate residency or fellowship programs for PAs. The two hospitals that did not currently have programs expressed interest in eventually having a postgraduate program. A quote from one respondent provides insight into the reasoning behind this interviewee's motivation to start a postgraduate PA program:

"Especially working in the medical center with some of the sickest patients in the world . . . the acuity level is so much higher *and* the expectation. Because the literature says that it takes anywhere from 7-10 months for a new PA to start producing . . . I think that we need to take that time and use it as an educational piece, extend out the orientation . . . and make sure they're [the PA] a good fit for the institution."

Another respondent anticipated the start of a postgraduate PA program at its facility within 2-3 years, and described the type of training program it would be:

"It's going to depend on which departments are in need at that time. It may end up rotating around. It's probably going to start off in the general surgery is where I anticipate it, and then maybe cardiothoracic surgery. But it's going to be based upon need for the first few years."

PA Retention. Although the number of PAs is growing within TMC, the turnover rate at all facilities was reported to have remained stable or decreased over the past seven years. Interview participants were asked to rank the reasons PAs are not retained at their facility in order of most common to least common reason for

leaving: relocating for a spouse's career, change in specialty, retirement, promotion/title advancement at another facility, or increased financial compensation elsewhere. The majority of interviewees (n=3) felt the most common reason for PAs leaving was due to increased compensation elsewhere. Compensation was followed by relocation of a spouse as the second most commonly reported reason for leaving. Table 9 displays the ranking of reasons for PA turnover at each hospital.

Table 9

Common Reasons for Leaving

Hospital	Rankings				
	1 (Most Common)	2	3	4	5 (Least Common)
A	Increased compensation elsewhere	Change in specialty	Promotion at other facility	Relocation for spouse's career	Retirement
B	Increased compensation elsewhere	Promotion at other facility	Relocation for spouse's career	Change in specialty	Retirement
C	Relocation for spouse's career	Promotion at other facility	Retirement	Increased compensation elsewhere	Change in specialty
D	Increased compensation elsewhere	Relocation for spouse's career	Promotion at other facility	Change in specialty	Retirement
E	Relocation for spouse's career	Increased compensation elsewhere	Change in specialty	Promotion at other facility	Retirement

Theme 5: Billing Obstacles

The theme of billing obstacles for PAs employed within a hospital setting emerged from interviewees' responses regarding wRVUs, efficiency measures, and even reasons for employing PAs. Only one hospital reported a positive relationship between PA practice and billing measures. However, this was specific only for the emergency department at this hospital and was not the case for other departments within this hospital: "I know in the emergency departments, we're well over our collections, but I know that surgery for example, they actually can't bill for their [PA] services because there's residents there." The majority of hospitals (n=4) instead expressed difficulty in PA billing practices. Interviewees noted:

"Sometimes billing, when it comes to [PAs], becomes an afterthought. And it also depends upon the service. Because whether or not it's based upon a shared visit or an incident to or if it's in a bundle payment, a lot of times the coders and billers really don't know how to code what we do, and I think that a lot of times people, when they don't know how to do something, they just don't bill for it. And that's a hard part because that's a significant amount of money. The other part I think is that people will think that we can't bill [for PAs] or that we have to bill under a physician's Medicare number. There was a lot of misinformation and that was one of the areas that I was trying to work on."

"Number one, their [PAs'] collections probably weren't being done properly. . . . we were leaving a lot of money on the table. And especially in this day and age where we have to justify our existence financially, because justifying our existence qualitatively is very challenging to those who are in charge of the budget."

Interview participants identified metrics that influenced a PA's financial compensation and whether PAs at the facility "broke even" in regards to their net collections and their salary. Most hospitals (n=4) reported that it was difficult to quantify how much money a specific PA made the hospital. Only one hospital actually measured

whether their PAs generated enough revenue to break even with their salary. This hospital reported that only 25% of their PAs “break even.” According to the other interviewees, measuring PA productivity quantitatively is difficult due to how and if PAs bill for their services, and it’s not practical to align PA compensation with their productivity. One hospital reported their PAs’ financial compensation to be based on merit and longevity instead of productivity:

“Our PAs do not have RVU targets. . . . [Financial compensation] is not based on productivity, because again, those people who work in a purely shared model would be paid \$0 because they don’t have any billing specifically assigned to them. But if they [PAs] weren’t here, all of that revenue generation would stop or be severely impaired because the physician wouldn’t be able to have that productivity level by themselves. So there are no PAs that have compensation tied to productivity.”

Discussion

While each facility provided unique and variable findings on the utilization and integration of PAs into their hospital, there was a large degree of commonality across institutions regarding the benefits and challenges inherent to hiring PAs. The central findings of the Texas Medical Center institutions are that PAs provide continuity and consistency in teaching hospital environments, PAs are essential to the shortage of medical providers and increase patient access to care, PAs provide a vital backbone to the team-based approach to medical care, and there is room for improvement when it comes to the utilization of PAs and their deployment in large medical institutions.

Areas for improvement regarding PAs in the medical center include: (1) The education of medical staff (both administrators and physicians) on the scope of practice of PAs in order to improve the ways that PAs deliver patient care by working to the top of their license and training, (2) The financial impact of PAs to institutions are variable and difficult to quantify due to inconsistent billing practices, shared billing practices, and use of residents/trainees, and finally, (3) Measuring the clinical efficiency of PAs has significant flaws when tracked through resources such as wRVUs, especially in particular departments.

Although most facilities ranked wRVUs as the top measure of clinical efficiency in the quantitative data, these facilities identified why wRVUs are not an accurate nor optimal way to measure PA efficiency. This suggests a need for standardization of PA billing practices and better metrics to evaluate PA productivity.

Multiple facilities began hiring PAs in order to provide continuity of care as capping resident work hours was more strictly enforced. However, the respondent in a facility that employs more than 300 PAs and has utilized PAs for over twenty years identified that PAs bring value to the patients but not to the practice. This may support the idea that the clinical efficiency of PAs cannot always be measured with a certain number or statistic.

PA Leadership Structures

Hierarchical leadership structures for PAs within an institution was not standard practice. Better PA leadership structures within institutions could address and improve areas of concern such as education of administrators and physicians regarding PA scope of practice, billing practices for PA services, and efficiency/utilization issues. As the number of PAs employed by an institution expands, it is intuitive that a PA leadership structure would be beneficial. Implementing leadership structures could promote better communication, advocacy, and standardization for PAs within a given hospital system. While many institutions were attempting this through “practice advisory councils,” not all facilities had a formal practice advisory council, or system-wide involvement of PAs on various committees.

In general, there is a lack of organized PA leadership structures. At several institutions, there was not an identified director or leader of the hospital’s PAs. The lack of leadership structure is a barrier to standardizing billing practices and optimizing efficiency measures. Further, not all institutions were able to provide details on the number of employed PAs at their institution (see Table 2) which suggests that hospitals are not actively tracking this data. These are important conclusions to note as the nationwide healthcare field struggles to quantify the value of PAs. In other words, as the saying attributed to Peter Drucker on modern business management goes, “If you can’t measure it, you can’t improve it.”

Limitations

This study had several limitations and potential opportunities for improvement. The collection of quantitative data was challenging, and institutions were not able to provide all the data we attempted to collect. In regard to the qualitative data collection, while we attempted to interview individuals overseeing the entire PA workforce at each institution (such as clinical directors or managers), we found many institutions lacked a formally designated manager overseeing PAs. For example, at one location, the participant was the manager of PAs within only the emergency department. Additionally, we found some PAs receive privileges or are contracted from outside companies, which made it difficult for hospitals to speak on their behalf. Another difficulty was tracking the number of PAs at each facility per calendar year because hospitals often track per fiscal year. The sample size of the participating institutions was small and limited to institutions within Texas Medical Center. However, our research design could be easily replicated for larger scale data collection nationwide and is a foundation for further studies.

Strengths of the Study

Despite acknowledging a degree of collection bias, we feel our ability to sample institutions in the Texas Medical Center, the largest medical center in the world, is a strength. To our knowledge, there have been no previous studies looking into the utilization of PAs on a collective multi-institutional scale. This allowed our study to identify various trends involving PA utilization in the hospital setting. Another strength of our study was our mixed methods approach. A solely quantitative study would not have allowed us to explore themes in detail or identify rationale and explanations behind rankings. On the other hand, a purely qualitative approach would not have provided cohesive bottom-line conclusions that were identified by our ranking system.

Future Implications

This study provides an outline for areas of improvement for the PA profession as it expands in the coming years. This study also identifies areas for future studies, such as more detailed research on the ideal efficiency metrics and billing practices for PAs.

Conclusion

In conclusion, this study reaffirms that the PA profession is firmly embedded in the US healthcare system and the employment of PAs is continuing to grow. Two main factors driving its growth are increasing access to care and providing continuity of care. However, as institutions continue to employ PAs, they need to address workflow structure challenges that are inherent to utilizing PAs. Further, implementing leadership structures for PAs within an institution would allow hospitals to better address these challenges. This study also concluded there is still a need to continue educating physicians, healthcare managers, and patients on the PA scope of practice. By improving the knowledge of PA training and scope of practice, the actual efficiency and tangible utilization of PAs will continue to mature.

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Appendix A

Original Quantitative Data Collections Form

Name of Institution:	2011	2012	2013	2014	2015	2016
OVERVIEW						
Total number of APPs						
Total number of PAs						
Total number of NPs						
Total number of other advanced practice providers						
NEW HIRES						
Number of PAs hired annually						
Number hired into a surgical specialty						
Number hired into a medical specialty						
Prior experience level as a PA (in years) of new hires						
% of new hires that are new graduates (≤12mo since graduation)						
% of PAs who have completed postgraduate training						
RESPONSIBILITIES						
% of PAs with primarily inpatient responsibilities						
% of PAs with primarily OR responsibilities						
% of PAs with primarily outpatient responsibilities						
BREAKDOWN OF SURGICAL SUBSPECIALTIES						
# of PAs in general surgery						
# in surgical subspecialties						
CATEGORICAL BREAKDOWN OF SURGICAL SUBSPECIALTIES						
# in cardiothoracic surgery						
# in orthopedic surgery						
# in neurosurgery						
# in ophthalmology						
# in urology						
# in trauma						
# in otolaryngology						
# in surgical hospitalist						
# in OB/GYN						
# in plastic and reconstructive surgery						
# in transplant						
# in other surgical subspecialties (please define)						
BREAKDOWN OF MEDICAL SUBSPECIALTIES						
# of PAs in internal/general/ pediatric medicine						
# of PAs in other medical subspecialties						

CATEGORICAL BREAKDOWN OF MEDICAL SUBSPECIALTIES						
# in cardiology						
# in pulmonology						
# in endocrinology						
# in gastroenterology						
# in neurology						
# in nephrology						
# in infectious disease						
# in other (please define)						
OTHER SPECIALTIES						
# of PAs in critical care						
# of PAs in emergency medicine						
CALL RESPONSIBILITIES						
% of PAs that take call						
PA-MD RELATIONSHIP STRUCTURE						
# of services with 1:1 model						
List of the specific departments that use a 1:1 model						
DELEGATED ADMINISTRATIVE/TRAINING/PROFESSIONAL DEVELOPMENT TIME						
% of time allotted for admin/training/professional development time						
RETENTION RATE						
Retention rate						
PEER REVIEW PROCESS						
Frequency of peer review process						
Personnel responsible for conducting peer review process						
RESEARCH						
Number of publications by PAs						

Appendix B

Revised Quantitative Data Collections Form

Name of Facility:

	2011	2012	2013	2014	2015	2016
Total Physician Assistants						

	2011	2012	2013	2014	2015	2016
Physician Assistants, credentialed and employed by your facility						
Physician Assistants, credentialed but contracted from other sources						

Appendix C

Qualitative Data Interview Form

This interview is intended to include both medical and surgical physician assistants at this institution from 2011 to 2016.

1. What is the primary reason you choose to employ physician assistants in your facility?
 - a. Please rank the following, with 1 being the most important and 3 being the least important.
 - i. Increase access to care
 - ii. Financial impact
 - iii. Physician satisfaction
 - b. Please expound on why you ranked the above reasons in that particular order?

2. Does your hospital have an orientation period for new hires?
 - a. If no, please skip to question 3.
 - b. If yes, what is the average length of their orientation period (in months)?
 - i. Regarding the structure of the orientation process, would you describe it as formal, informal, both or other?
 1. Formal: includes a formal skills check off on clinical competencies (i.e. surgical skills, common procedures, etc.)
 2. Informal: includes primarily on-the-job training but doesn't include a formal check off
 3. Combination of formal and informal.
 4. Other, please explain
 - ii. Please describe the orientation process for newly hired physician assistants.

3. Regarding your overall turnover rate of physician assistants for the past 3 years:
 - a. Is this facility's turnover rate of PAs increasing, decreasing, or remaining stable?
 - b. Please rank the reasons PAs are not retained at your facility, with 1 being the most common reason for leaving and 5 being the least.
 - i. Relocating for spouse's career
 - ii. Change in specialty
 - iii. Retirement
 - iv. Promotion/title advancement at another facility
 - v. Increased financial compensation elsewhere

4. Please rank the following workflow models in order from most commonly used model to least commonly used model:
 - a. 1:1- This describes one physician assistant working primarily with one physician
 - b. Team- This describes multiple physician assistants working with all attending physicians in a particular department
 - c. Location based- This describes physician assistants who practice at one specific location and thus with the attending physicians who practice there, either regularly or on a rotational basis
 - d. Other (please specify)

5. Do you have a practice advisory council for APPs or a designated board representing the interests of APPs?
 - a. If no, please skip to question 6.
 - b. If yes:

- i. How many people comprise the practice advisory council and how is their appointment determined/renewed?
 - i. Rank the goals and responsibilities of the council from most important (1) to least important (4 or 5)
 1. Defining the scope of practice and roles of physician assistants
 2. Determining quality and safety across the institution
 3. Impact of legislation on current practice
 4. Serve as a peer review process
 5. Other (please specify)
6. How does this institution define clinical efficiency?
- a. The following items listed are potential measures of efficiency. Please rank them with 1 being the most significant outcome measurement and 4 being the least.
 - i. wRVUs
 - ii. Patients seen
 - iii. Discharge times
 - iv. Patient satisfaction
 - b. On a scale of 1 to 10, with one being not efficient at all to 10 being the most efficient possible, how efficiently are PAs being utilized at your institution?
 - c. The following items listed are perceived barriers to clinical efficiency. Please rank them with 1 being the most significant barrier faced and 4 (or 5) being the least.
 - i. Staffing limitations
 - ii. Facility limitations
 - iii. Education on scope of practice
 - iv. Financial resources
 - v. Other (Please define and explain.)
7. How often (in months) are efficiency metrics reviewed with employees?
- a. Do productivity metrics influence the financial compensation of employees?
 - i. If no, please skip to question 8.
 - ii. If yes, how?
8. What percentage of physician assistants at this institution have their net collections equal their salary? Or, in other words, what percent of PAs “break even” financially from the hospital’s standpoint?
9. Are research opportunities available to your physician assistants?
- a. If no, please skip to question 11.
 - b. If yes, what percentage of PAs actively take advantage of these opportunities?
 - i. How many publications do your physician assistants produce annually?
10. Regarding continuing medical education (CME) requirements, are funds provided to PAs?
- a. If yes, what is the average allotment per year?
 - i. What is the average allotment taken per provider annually?
 - b. Are providers given time off to complete these requirements/attend professional conferences?
 - i. If no, please skip to question 12.
 - ii. If yes, is this time taken out of their PTO?
 1. If it is not taken out of the provider’s PTO, what time is it coming out of?
11. Are there any formal or informal residencies/fellowships offered for PAs at your facility?
- a. If no, please skip to question 13.

- b. If so, please expound on the following aspects of each program at your hospital: (If there is more than one program, please discuss each one separately.)
 - i. Organization
 1. Is the program medical or surgical?
 - a. Single subspecialty or rotation based?
 - i. If rotation based, what are the areas in which learners rotate through?
 2. Who do learners report to?
 3. Intra-organization structure
 - a. Number of learners accepted each cycle
 - b. Enrollment cycle (annual or multiple times a year)
 - c. Interview process
 - d. Program length
 - ii. Pay/benefits
 1. Do the learners receive financial compensation?
 - a. If yes, how much is their allotment?
 - b. If no, please skip to question
 2. Are health benefits such as health insurance and dental coverage offered to learners?
 - a. Please discuss any additional benefits offered to learners.
 - iii. Clinical requirements
 1. Please describe any clinical requirements.
 - iv. Education requirements
 1. Please describe the educational requirements necessary to graduate the program.
12. How does being a physician assistant at _____ set them apart from PAs at neighboring facilities?
13. Reflecting on the past 5 years, describe the growth of physician assistants at your institution.
14. How do you see the role of physician assistants evolving at this facility over the next decade?