

# Physician Assistants in American Medicine: The Half-Century Mark

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A prevailing issue within the US medical workforce is the adequacy of the physician supply to meet the needs of a nation undergoing health service expansion. Despite an increase in the number of medical schools and boosted enrollment, substantial shortages of physicians are predicted. The Association of American Medical Colleges estimates a shortage of 124,000 full-time equivalent (FTE) physicians by 2025, with primary care accounting for the largest share of the deficit (37% or ~46,000 FTEs). Family medicine put this primary care estimated shortage at 52,000 physicians by 2025. Beyond calling attention to a physician shortage in general, and a diminishing supply of primary care physicians in particular, there is a clear indication that other providers are needed.<sup>1</sup> Increasingly, physician assistants (PAs) are expected to help fill workforce shortages. As the profession approaches the half-century mark, an update of the PA profession may serve as a reference point for policy analysis.

The PA was a workforce idea created by physicians in the 1960s as a policy response to the shortage and uneven distribution of generalist doctors. The intention was to increase the public's access to healthcare.<sup>2</sup> The National Commission on the Certification of Physician Assistants records that there are approximately 100,000 PAs who have ever been certified.<sup>3</sup> Taking into account those who have left the workforce and those who are entering as new graduates we estimate 89,500 PAs with active licenses in 2013. There are 173 PA programs, with 60 in development. While all are trained in the generalist model, PAs are employed in primary care, specialty, and subspecialty medicine, and work in collaboration with physicians in most clinical practice settings.<sup>4</sup>

## DEFINITION AND LEGAL STATUS

Physician assistants are health professionals licensed to practice medicine with physician supervision. They share an interdependent relationship with physicians sociologically described as “negotiated performance autonomy.”<sup>5</sup> The PA scope of practice corresponds to the supervising physician's practice and varies according to the training, experience, facility policy, and state law. Qualifications for PA licensure are (1) graduation from an accredited PA program and (2) passage of the Physician

Assistant National Certification Examination administered by the independent National Commission on Certification of Physician Assistants. Licensed PAs

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**Background:** The concept of the physician assistant (PA) was developed by US physicians in the 1960s as a workforce strategy to improve the delivery of medical services. Then as now there is an anticipated shortage of physicians, particularly in primary care. Use of PAs is viewed as 1 possible strategy to mitigate this growing gap in provider services.

**Objectives:** To describe the PA in US medicine for policy background and analysis.

**Description:** In January 2013, approximately 89,500 PAs were licensed: 65% were women. Four-fifths were under the age of 55 years. PAs are trained in 2.5 years at one-fourth the cost of a physician and begin producing patient care 4 years before a physician is independently functional. One-third of PAs work with primary care physicians; 65% work in non-primary care practices. Popular specialties are family medicine, emergency medicine, surgery, and orthopedics. PAs are revenue producers for employers and expand access and clinical productivity in most practice settings. Roles for PAs have expanded into hospital settings and graduate medical education programs. About 7300 PAs graduate annually, and this number is expected to grow to 9000 by the end of the decade. Predictive modeling suggests that demand for medical services will grow faster than the combined supply of physicians, PAs, and nurse practitioners, particularly in primary care. PA quality of care appears indistinguishable from that of physician-delivered services.

**Conclusions:** Optimal organizational efficiency and cost savings in health services delivery will depend on how well the PA can be utilized.

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### Take-Away Points

Physician assistants (PAs) receive generalist training that permits their widespread use in most areas of medicine under doctor supervision.

- The PA concept has been a successful health workforce innovation in US medicine and is spreading globally.
- The contributions of PAs to primary care involving effectiveness, safety, patient satisfaction, and outcomes of care are comparable to those of physicians.
- The addition of PAs to primary care teams tends to improve coordinated, comprehensive care and helps to maintain the continuity of care.

have prescribing authority in all states, although laws vary with regard to certain prescribing privileges and supervisory requirements.<sup>6</sup>

In their work, PAs routinely perform a comprehensive range of medical duties, spanning primary care to high-technology specialty procedures. In primary care, they serve as front-line providers working typically with family physicians. In surgery they serve as first assistants as well as providing pre-operative and postoperative care.<sup>7</sup> In some rural areas where physicians are in short supply, PAs work semiautonomously, conferring with their supervising physicians as needed and as required by law.<sup>8,9</sup>

## EDUCATION

As of 2013 there were more than 173 accredited PA programs, a number that has grown rapidly over the past decade (**Figure 1**). An additional 45 programs have applied for initial accreditation; 20 more are in the development pipeline progressing toward accreditation status by 2017 (J. McCarty, CEO of the Accreditation Review Commission on Education for the Physician Assistant [ARC-PA], written communication, April 2013; ARC-PA website updated April 12, 2013). The average program length is 27 months, operates year-round, and typically comprises 1 year of classroom and laboratory instruction and a second year of clinical experience.<sup>10</sup> Physician assistant programs graduate, on average, 44 persons per program each year. The 2012 graduating cohort was 7300 (estimated); this number is projected to increase to 9000 annual graduates by 2020.<sup>11</sup> Two-thirds of matriculates are female and the median age at graduation is 29 years (range, 23-55 years).

Although accredited PA programs have demonstrated compliance with a core set of educational standards (ARC-PA *Standards*, 4th edition), they have the discretion to offer a variety of academic degrees, with the master's degree as the norm. The curriculum resembles a competency-based (and shorter) form of medical education with basic sciences and clinical rotations. Students complete an average of 2000 hours of supervised clinical practice prior to graduation with

the average length of clinical clerkships approximately 52 weeks.<sup>10</sup>

From a policy standpoint, PA education has been supported through Title VII, section 747, which provides incentives for programs to have diverse student selection, a primary care training focus, and deployment to rural and underserved settings.<sup>12</sup> Since the early part of this century Title VII funding has been reduced for PA education with

an exception in 2010 when one-time funding was created under the American Recovery and Reinvestment Act of 2009. During this phase, Expansion of Physician Assistant Training grants were used to bolster primary care. As of 2012, 39 of the 173 PA programs received some amount of federal training support.

Typical PA programs are sponsored by a university school of medicine, school of health sciences, or similar college within the institution.<sup>13</sup> An average start-up cost of a PA program is approximately \$2.5 million (direct cost in 2010 dollars) spread over the first 5 years.<sup>14</sup> Without federal start-up funds, the cost is borne by the home institution. Tuition cost of a PA education averages \$65,000 (2010 dollars; 28 months).<sup>10</sup> Student debt is estimated around \$55,00 on average with a range between \$0 and \$150,000 for 2012.<sup>15</sup>

## DEMOGRAPHICS

In 2013, more than 89,500 PAs held an active state license to practice. Approximately 80% of all PAs are under the age of 55 years, making this one of the more youthful health professions (**Figure 2**).<sup>3,16</sup> The median age of PAs in clinical practice is 41 years (range, 23-74 years); 65% are women.<sup>4,10</sup>

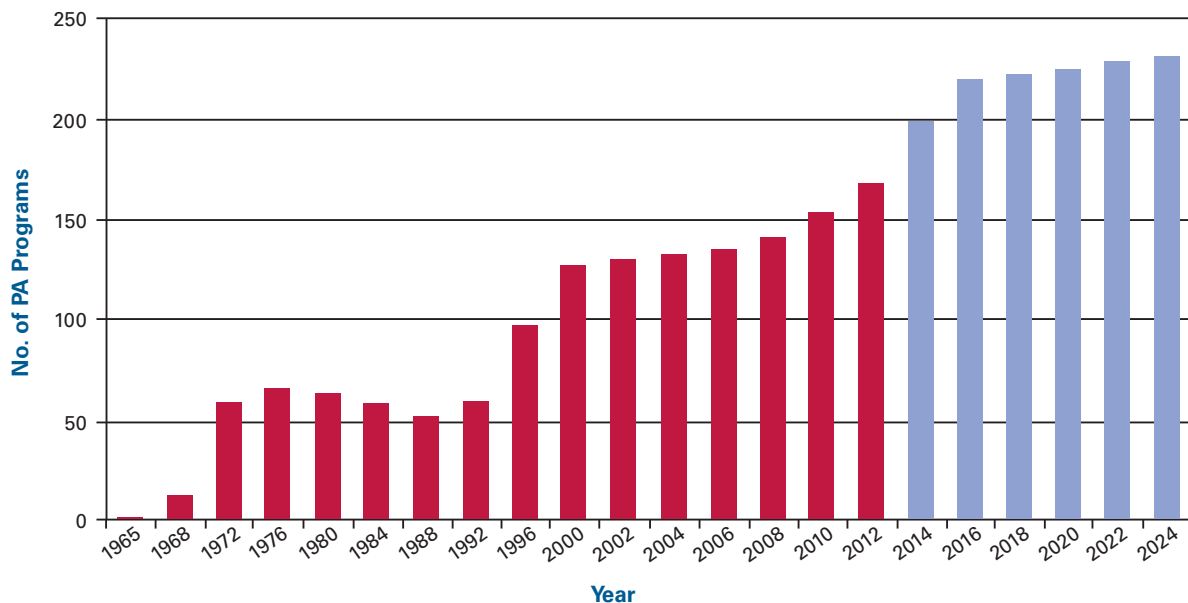
Although PAs are widely distributed across the nation, the highest density per capita is in Alaska and the lowest in Mississippi. New York, Pennsylvania, Florida, California, and Texas have the greatest number of PAs and also have the largest concentration of PA programs per capita. Physician assistants working in nonmetropolitan census tracts are found in every region, but more so west of the Mississippi River.<sup>17</sup>

The PA profession has grown from 29 graduates in 1969 to 100,000 ever-graduated in 2012, with growth particularly pronounced in recent years.<sup>3</sup> More specifically, the number of people with an active license to practice will exceed 100,000 by the year 2016. This annual growth is projected at 7% and an annual attrition rate is estimated at 4% to 5% out to 2025.<sup>11</sup>

## INTERPROFESSIONAL PRACTICE

Team-based care is the byword among various health professionals as the demand for services increases. It is a term

■ **Figure 1.** Total and Projected Number of Accredited Physician Assistant Programs, Select Years, 1965-2024



PA indicates physician assistant.

mentioned frequently by family medicine practitioners as they face a growing demand for their services.<sup>18</sup> Evidence of the benefit of team-based care as it applies to PAs is growing; in 1 health maintenance organization they improved the outcomes of some chronic diseases in the elderly, and at the same time patient satisfaction with care was higher than it was for physician-only care.<sup>19</sup> A Wisconsin primary care network study demonstrated that service delivery by physicians, PAs, and nurse practitioners (NPs) was similar regardless of the complexity of the patient and the type of service. In this example, panels of patients assigned to PAs and NPs had higher proportions with Medicaid, disability, and depression.<sup>20</sup> Findings on PAs in primary care are growing, and a shortage of primary care physicians in the pipeline suggests that the employment of PAs is likely to grow more in this domain.<sup>21</sup> In orthopedics the use of PAs as first assistants freed up family medicine physicians for more clinical work, increased the throughput of hip and knee replacements by 42%, and decreased the wait times by one-third compared with the preceding year without PAs.<sup>7</sup>

## FEDERAL POLICY SUPPORT

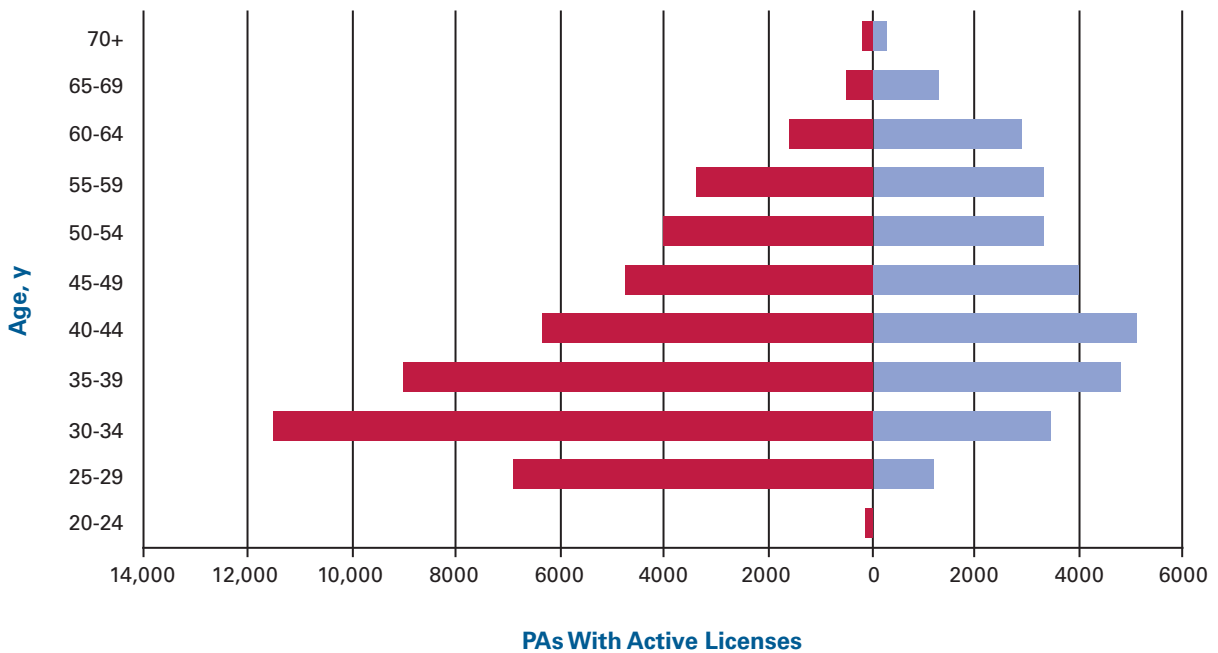
The development of the PA arose from federal health policy initiatives, and the results gained wide support in the public and medical sectors. The major funding source, Title VII, section 747, provides support for PA education and has waned, with roughly one-fifth of programs receiving federal support of less than \$10 million.<sup>12</sup> This decreased funding is in contrast to the Department of Health and Human Services

awarding about \$200 million to 5 hospitals to train additional advanced practice registered nurses.

## PRIMARY CARE

There appears to be an increasing reliance on PAs and NPs to deliver primary care services.<sup>22</sup> A report from the National Center for Health Statistics indicated that care managed by PAs and NPs in nonfederal hospital outpatient departments increased from 10% in 2001 to 15% in 2009.<sup>23</sup> This increase indicates that PAs are being more widely utilized, particularly in settings where a large number of primary care services are delivered. Physician assistant involvement in providing services varied by location, with these providers handling 36% of visits in nonmetropolitan centers versus only 6% of visits in urban hospitals. Also, the size of the hospital correlated with increased use of PAs or NPs; the smaller the hospital, the more likely that the hospital was using them.<sup>23</sup> Physician assistants and NPs also delivered care more often in clinics associated with nonteaching hospitals and handled a higher percentage of Medicaid, Children’s Health Insurance Program, or uninsured patients, as well as younger patients. Physician assistants and NPs saw a higher percentage of patients where a new problem was the major reason for the visit (22%) compared with visits for a chronic condition (11%) or pre/post-surgical care (6%). In addition PAs and NPs saw a higher percentage of patients with preventive care visits (17%) compared with visits for a routine chronic condition or pre/post-surgical care.<sup>23</sup>

■ **Figure 2.** Physician Assistants Holding an Active License, 2013



PA indicates physician assistant.  
Source: Optum, Provider 360.

Ambulatory visit analyses suggest that PAs and NPs are used to a greater degree in smaller facilities located in non-urban areas to serve populations that may be otherwise medically underserved, trends that are consistent with the policy intentions of their creators. The National Center for Health Statistics report confirms that PAs and NPs “continue to provide a critical healthcare function” by administering care in communities that are prone to physician shortages, including rural, small, and nonteaching hospitals. Physician assistants and NPs tend to provide care that is more prevention oriented than physician care and are proportionally more likely than physicians to see patients without private insurance.<sup>24,25</sup>

In primary care, the major issue is provider supply.<sup>21</sup> While the absolute number of primary care providers is expected to rise in the coming years, these changes are not expected to be sufficient to meet the demands of an aging population, changes in service use, new technology, and trends connected with a major expansion of insurance coverage.<sup>18,26</sup> The best estimates of the primary care provider supply continue to indicate that there are significant shortages. According to 2009 numbers from the Agency for Healthcare Quality and Research, only about one-third of the nation’s 625,000 practicing physicians, or about 208,000 providers, work in primary care; and, as of 2010, about 43.4% (n = 30,300) of the estimated 70,333 PAs in practice and 43% (n = 55,626) of the estimated 106,000 NPs in practice are currently in primary care.<sup>27</sup>

## RURAL HEALTH

Significant shifts in PA distribution and utilization patterns have resulted in an increase in rural primary care since the early 2000s. Historically, PAs provided such services in rural and urban areas that often lacked sufficient access to healthcare.<sup>9,28,29</sup> Many small rural clinics in the far West are staffed with a PA alone; arrangements are worked out to supervise the PA remotely and for the physician to visit the clinic periodically to review charts and see patients together with the PA.<sup>8</sup>

For populations with large groups of medically underserved and economically disadvantaged individuals, the PA is making an impact.<sup>29</sup> Some evidence is emerging that PAs and NPs are proportionally more likely than family physicians to be in these settings.<sup>28</sup> Community Health Centers, another creation of the 1960s, are sometimes medically staffed at 50% PA/NPs, more than twice that of private practices.<sup>23</sup> Many Community Health Centers are considered highly efficient centers for primary care experimentation and delivery and are rapidly achieving patient-centered medical home status. Between 2010 and 2016 Community Health Centers are scheduled to grow 50%, and recruitment for all 3 types of clinicians has intensified.<sup>30</sup>

The numbers of PAs and NPs involved in chronic disease management are growing. One study that examined 10 million primary care visits in the Veterans Health Administration between 2005 and 2010 found that PAs and NPs attended

30% of all visits, with little difference in patient characteristics or diagnoses among the 3 types of clinicians.<sup>31</sup> Significant regional variations in ratios of the 3 types of providers suggest primary care staffing configuration is more a function of attitude than administrative rationale.

### SPECIALIZATION AND SETTING

Although their training is focused on primary care, two-thirds of PAs practice in surgical specialties or medical subspecialty areas such as cardiology, rheumatology, and inpatient medicine; orthopedics, dermatology, and emergency medicine are particular areas of strong demand and utilization. While the majority of PAs are in full-time clinical practice, some also incorporate their clinical knowledge into other employment settings such as clinical research, education, and administration. One-fourth (24%) of PAs work in single-specialty group practices; the largest single practice setting for PAs is multispecialty group practices.<sup>4</sup> The specialty fields with the largest proportion of those in clinical practice are family/general medicine (25%), surgical subspecialties (22%), subspecialties of internal medicine (11%), emergency medicine (10%), and general internal medicine (7%). Types of employment settings with the largest proportions of PAs include single-specialty and multispecialty group practices, solo practice physician offices, hospital operating rooms, emergency departments, and inpatient and outpatient units of hospitals.<sup>4</sup>

### QUALITY OF CARE AND LIABILITY

The liability of PAs in the United States is considerably less than that of physicians in comparable roles, as measured by medical insurance premiums and malpractice cases. Physician assistants have fewer than 1% of all medical malpractice payment reports.<sup>32</sup> Several studies have shown the quality of care provided by PAs is at the level of that provided by physicians in comparable situations, with high levels of patient satisfaction.<sup>25</sup> In primary care practices, PAs handle common patient complaints, follow-up visits, and patient counseling. Use of PAs permits patients to receive prompt attention, with routine problems addressed effectively with the expertise of the available physician if needed. This strategy can provide more time for a physician to focus on different aspects of the practice (eg, managing more complex or time-consuming patients).

The quality of care provided by PAs was assessed in the US Air Force, where PAs deliver a considerable portion of primary care formerly provided by physicians. Quality-of-clinical-care determinations were made on the basis of responses to predetermined diagnostic, therapeutic, and referral and disposition criteria. Therapeutic criteria included desirable actions on the

part of the healthcare provider (eg, prescribing the appropriate class of antibiotic for infectious otitis media at the first visit) and undesirable actions (eg, prescribing an antibiotic for viral syndrome with gastroenteritis). On 5 of 6 such criteria, PAs performed as well as or better than physicians in identifying desirable therapeutic actions.<sup>33</sup>

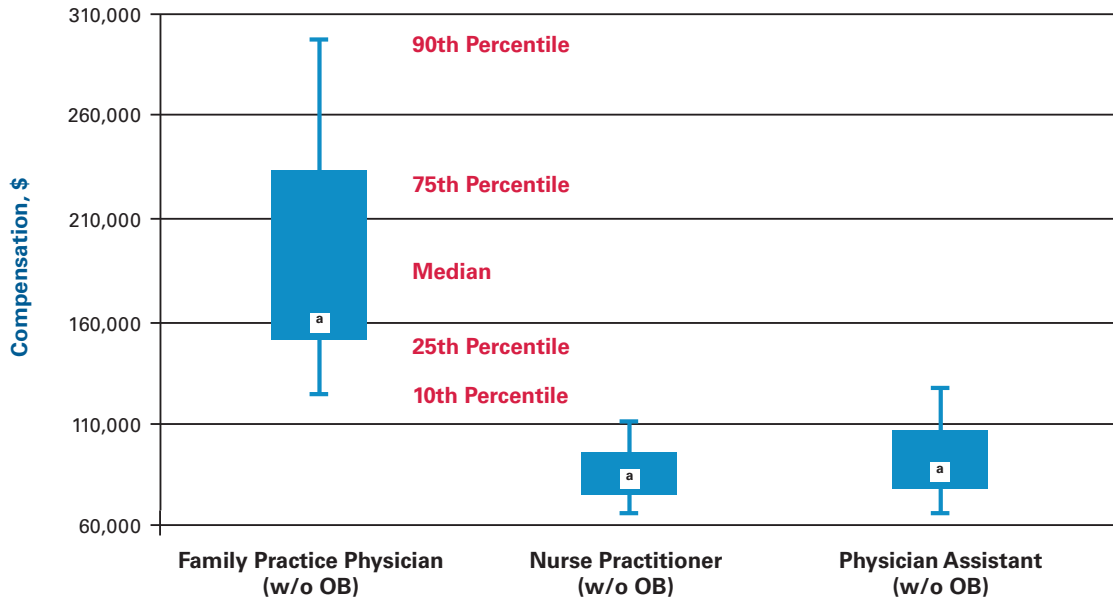
### ECONOMICS

The benefit of PA employment is rooted in labor economics and industrial engineering. From a management standpoint, PAs receive less compensation than physicians. While compensation differs substantially across specialties and employment settings, the salary differential of a PA and a family physician in the same location is approximately 45% (Figure 3<sup>34</sup>). The employing organization, duration of a PA career, contract arrangements, return on revenue, and benefits will affect the overall salary. This 45% salary differential between a board-certified family physician and a family medicine PA, as measured by the Medical Group Management Association, has been a constant for over a decade.<sup>34</sup> However, substantial differences occur in other areas such as cardiology, dermatology, emergency medicine, neurology, cardiovascular surgery, and orthopedics. In the entrepreneurial setting, the labor input of PAs can generate multiples of their salary in revenue received.

The organizational aspect of PA employment strongly influences how they are used—either as *substitutes* or *complements*—to improve productivity (economically a substitute usually is not identical to what it is replacing). By any measure, PAs are productive and would not be employed if they were not so. Their annual compensation-to-production ratio (as measured by revenue) is one of the highest in the health professions industry.<sup>34</sup> They are used in high ratios to physicians in most vertically integrated systems such as Kaiser Permanente, Geisinger, Cleveland Clinic, Group Health Cooperative of Puget Sound, and the Mayo Clinic, to name a few. Their output compares favorably with that of physicians when they are employed largely as labor substitutes in specialties such as emergency medicine, family medicine, and dermatology (although patients can be differentiated for select PA services and to improve system throughputs).<sup>35,36</sup> The PA in family medicine sees a wide variety of patients with diagnoses that are 85% to 90% of the full range of a family medicine physician.<sup>29</sup>

In terms of utilization, the federal government has been an employer of PAs since 1968 and the largest single employer to date.<sup>37</sup> The Veterans Health Administration could not meet the needs of its growing and aging population in 150 medical centers and 900 community-based outpatient clinics without a large cadre of PAs and NPs.<sup>31,38</sup> The military is a major employer of PAs, and these PAs must be prepared for multiple

■ **Figure 3.** Compensation for Family Physicians, Physician Assistants, and Nurse Practitioners, 2010<sup>a</sup>



OB indicates obstetrics; w/o, without.

<sup>a</sup>Sample sizes for the comparison of compensation for primary care providers are as follows: family practice physician (n = 5524), nurse practitioner (n = 718), and physician assistant (n = 800).

Source: Medical Group Management Association 2010.<sup>34</sup>

roles such as battlefield traumatologists, family medicine clinicians in military treatment facilities, public health officers in refugee situations, and occupational medicine officers in barracks.<sup>37</sup> Within the US Coast Guard, the ratio of PAs to medical doctors is 2.5 to 1, and PAs may be the sole medical officer on polar-bound ships. The Interservice Physician Assistant Program graduates approximately 180 PAs per year.

Clinical productivity of PAs has been demonstrated in health maintenance organization organizational efficiency studies where staffing in family medicine, pediatrics, and obstetrics/gynecology sometimes exceeded 50% PA/NPs.<sup>39</sup> Physician assistants are first assistants in surgery, oversee the admission and discharge of patients, staff intensive care units, and are the main providers of care in low- and mid-acuity emergency medicine.<sup>36,40</sup> Productivity is comparable to that of physicians when trauma acuity scores and patient characteristics are held constant.<sup>41</sup> Generally PAs improve work flow and organizational efficiency when economies of scale and divisions of labor are introduced.<sup>42</sup>

Employing PAs appears to be cost-effective. A study of state practice environments reported: “Within their areas of competency, and within appropriate training and supervision, these practitioners may provide medical care similar in quality to that of physicians at less cost.”<sup>36</sup> In Utah, the utilization of PAs in primary care results in more annual productivity than comparable roles for physicians and NPs.<sup>43,44</sup> Physician assistants enable surgeons to delegate performance of preoperative histories

and physical examination, ordering and compiling of necessary tests, and part of the postoperative care. Familiarity and experience of the physician-PA surgical team result in efficiency in the theater that can reduce operative and anesthesia times.<sup>7,45</sup>

## ROLES IN GRADUATE MEDICAL EDUCATION

The 2004 Accreditation Council for Graduate Medication Education resident work hour restrictions accelerated the use of PAs in graduate medical education in lieu of and with physician residents, along with cutbacks in house staff and the diminishing availability of international medical graduates. Graduate Medical Education programs report positive experiences in major centers when PAs are used to provide inpatient services.<sup>46</sup> Such utilization has allowed in-house coverage of patients, protects the educational integrity of the physician residency programs by allowing time for residents’ conferences, maintains the continuity of clinics, and prepares residents for practice on multidisciplinary teams.<sup>47</sup> In a number of instances, PAs are performing advanced procedures such as cardiac catheterization as safely and effectively as physician residents.<sup>48</sup>

The downsizing of residencies and the migration of trainees to outpatient settings created an increased need to maximize residents’ educational experiences and to maintain standards of hospital care. The literature about the safety and efficacy of using PAs as resident substitutes in teaching hospital settings

is growing.<sup>49,50</sup> The primary reason cited by most academic health centers for employing PAs and NPs was resident duty hour restrictions (27%). Secondary reasons for employing PAs and NPs include increasing patient throughput (88%), increasing patient access (77%), improving patient safety and quality of care (77%), reducing length of stay (73%), and improving continuity of care (73%). However, 69% of academic health centers report they have not successfully documented the financial impact or outcomes associated with individual PA or NP care.<sup>49</sup> The biggest concentration of care resides in the 6000 or so acute care hospitals in this nation with a bed census of approaching 1 million. More than 40% of PAs work in hospital-based settings. New roles for PAs in these settings are as hospitalists and intensivists to offset the increasing demand for hospital-based physician services.<sup>51</sup>

Physician assistants appear to be an alternative for trauma centers unable to maintain a surgical residency program.<sup>52</sup> Although surgical residents who were able to provide skilled and cost-effective labor have traditionally staffed these centers, cut-backs in surgical specialty house officers have required substitutions for traditional trauma care providers.<sup>53</sup> In 1 example, the use of PAs in a large community hospital's level III trauma center resulted in decreases in transfer time to the operating room (43%), transfer time to the intensive care unit (51%), the length of stay for new admissions (13%), and the length of stay for neurotrauma intensive care unit (33%) patients.<sup>53</sup>

In an era of health reform, graduate medical education is undergoing scrutiny. In 2012, the Institute of Medicine formed a committee to examine the structure of Graduate Medical Education and to make recommendations regarding the issue of revising the number of Medicare-funded residency positions. In an era of growing debt and expansion of healthcare, Congress does not appear ready to put more money into training more physicians. However, redistribution of existing dollars should certainly be on the table. It is estimated that the 2010 Graduate Medical Education training system is costing the country \$100,000 per resident per year. If the average residency is 4 years in length, then it costs \$400,000 to train the typical doctor, and that is only after graduating from medical school (doctors are graduating from medical school with an average of \$150,000 of debt). Physician assistants can be trained to provide many of the same tasks (especially in primary care) at an equal level of quality, and finding the right proportion of PAs and doctors could provide a ready-made mechanism for overall cost savings.

### SUPPLY OF PHYSICIAN ASSISTANTS

The Affordable Care Act of 2010 is intended to strengthen primary care and will provide opportunities for PAs and NPs. It

is estimated that expanded insurance coverage under the Affordable Care Act will bring in an additional 25 million newly insured Americans by 2015, who will be seeking care from an already overburdened primary care system. Some predict that in order to deliver care to these newly insured persons, the workforce will require additional PAs, NPs, and other health professionals.<sup>54</sup> However, expansion of the number of enrolled students is limited by the shortage of qualified faculty and available clinical training sites. Expanding and new medical schools, PA programs, and NP programs all compete for similar clinical training slots. In addition, nursing education programs under Title VIII increase the amount available for federal nursing student loans.

### CLINICAL FLEXIBILITY

A unique aspect of the PA role is career flexibility: the opportunity to change specialties over the course of their career. Because PAs are prepared as medical generalists, they are able to adapt to the clinical practice setting of the physician. Physician assistants might work in an emergency department for a decade, switch to orthopedics for a few years, and then settle into a rural health practice in family medicine. In the course of a career, at least half of PAs have changed specialties at least once.<sup>14</sup> This role flexibility is believed to contribute to a high degree of job satisfaction and the retention of PAs in clinical medicine.<sup>14,55,56</sup>

Increased demand for primary care as more people gain coverage will likely stress system capacity in some sectors and is expected to lead to greater reliance on PAs and NPs in primary care. Under health reform, millions of newly insured people are expected to enter the healthcare system. As the Affordable Care Act expands coverage to 32 million individuals—mostly adults who were previously uninsured—through expansion of Medicaid and health insurance exchanges, an estimated shortage of 91,000 physicians has been predicted by 2020.<sup>57</sup> By most accounts, the demand for physician services will continue to exceed supply by large margins and the ratio of physician to population will shrink for the foreseeable future.<sup>58</sup> Although a growing cadre of PAs and NPs offsets this ratio to some extent, the ratio will not keep up with a demand that increases annually.<sup>18</sup> The theory of pent-up demand suggests that more Americans will want more medical services since they will be able to afford them. The confluence of lifestyle of physicians, scaling back of the house officer work week, and more technology and intensity of service mean less annual productivity than has been historically seen. Other drivers of this excess demand are the growing number of Accountable Care Organizations, patient-centered medical homes, and internists selecting to limit their panels of patients in concierge medicine arrangements.

To augment physician shortages, policy makers have suggested boosting the supply of NPs and PAs in the pipeline.<sup>59</sup> The Affordable Care Act aims to bolster the primary care practitioner workforce through scholarships, loans, and loan repayment programs, as well as through the creation and expansion of training opportunities. A sum of \$1.5 billion is available for the National Health Service Corps for scholarships and loan repayment for primary care physicians, PAs, and NPs. Physician assistant students can also qualify for the Primary Care Loan program and will benefit from the limited service obligation, decreased penalties for noncompliance, and exclusion of parental financial status when determining need.

## INTERNATIONAL VIEWPOINTS

There are PA education programs in Australia, Canada, The Netherlands, the United Kingdom, and South Africa. There are emerging PA programs in Germany, India, Korea, Ghana, and Saudi Arabia.<sup>60,61</sup> This concept is not new, and throughout Africa and South America there are many names for formally trained health personnel who produce medical services in the absence of a doctor.<sup>62</sup> Although having less formal education than American PAs, they tend to function in a wide variety of settings, provide primary care services, and contribute to the health of community.<sup>63</sup>

## CONCLUSION

The PA movement in America began in the 1960s and has flourished for half a century.<sup>2</sup> The educational preparation is rigorous and prepares graduates for medical service in most healthcare environments. Acceptance by consumers seems as high as that of physicians.<sup>25,64</sup> Uniform education, accreditation, and a national certification process have created a framework of standards for all state licenses (although limited licensure remains in one-fifth of states). Physician assistants work under the supervision of a physician but in a negotiated role of autonomy. They are permitted to prescribe and obtain reimbursement in all 50 states. Of the 100,000 individuals ever formally trained as PAs, more than 80% are in practice. Because this is a largely youthful profession (the average age of a clinical PA is 42 years and 80% are under the age of 50 years), the number of American PAs is expected to top 100,000 by 2017. As expansion of Medicaid coverage increases the annual number of primary care visits, the demand for additional primary care physicians, PAs, and NPs will grow.<sup>65</sup> Physician assistants will best serve the American system as adaptable health professionals able to move into areas of greatest need, but equally as likely to move as the market dictates.

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