EVOLVING MEDICINE: AN ANALYSIS OF THE ROLES OF PHYSICIAN ASSISTANTS AND NURSE PRACTITIONERS IN OUR CURRENT HEALTHCARE SYSTEM

by

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The Physician Assistant and Nurse Practitioner professions initially began in response to healthcare shortages after the Vietnam War in the 1960s. Highly trained combat medical personnel developed into highly skilled PAs, while during this same time nurses began advanced practices that ultimately evolved into the position of NPs. Since this time, the roles and responsibilities delegated to each of these fields have drastically evolved, and are expected to continue to do so in the face of current health care reform under President Obama’s Patient Protection and Affordable Care Act initiated in 2010.

Originally perceived as “understudies” to physicians, PAs and NPs have become much more trained in their expertise, respected in their roles, and autonomous in their practice. Due to this, it has been predicted that PAs and NPs will become the major primary care providers in the face of increasing demands
in this area of medicine. Large numbers of aging populations and up to 32 million newly insured patients seeking healthcare, coupled with physician shortages, have increased demands on PAs and NPs to fill these employment gaps.

As there has been an increased demand on the PA and NP profession, there has been a paralleled increase in the number of educational programs producing graduates, larger class sizes, and larger numbers of PAs and NPs entering the workforce. The problem is posed when PAs and NPs, who desire to pay off student loans quickly and, understandably, seek high wages and professional advancement, pursue specialty and subspecialty employment versus filling in primary care gaps as anticipated.

As the roles of PAs and NPs change, and more is expected of them in terms of practice and reliability, there are barriers to their growth. Professional tensions between these providers and physicians, poor understanding of what roles PAs and NPs hold by the public, unequal reimbursement for comparable services, and strict state legislation that limits the scope of practice of both PAs and NPs all inhibit these healthcare professionals from practicing to their fullest potential. This, in turn, may hinder persons becoming PAs and NPs from funneling into the ever increasingly demanding primary care field of medicine, and may pose future problems as patient populations increase under the Affordable Care Act.

This paper assesses the current roles and responsibilities of PAs and NPs, how each profession is expected to grow, and the evolution of these
healthcare providers as the potential “solution” to primary care needs. Statistics regarding current distributions of PAs and NPs in practice, educational expansion, obstacles that these professions must overcome, and the capabilities of PAs and NPs alike are analyzed, and conclusions drawn on what the contributions of these healthcare professionals may be in the future.

Overall, it is expected that PA and NP presence in the medical field will undoubtedly increase. Whether these professionals will serve as an adequate source of primary care providers in the face of increasing demands imposed by the Affordable Care Act is yet to be seen, however. Barriers including professional tensions, reimbursement policies, wages, and strict state restrictions on the scope of practice of these individuals will need to be addressed. While it is projected that PAs and NPs will “solve” the current and future primary care physician shortage, this fact truly remains to be seen.
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INTRODUCTION

General Background

The ever-evolving, present day healthcare system in the United States relies on the expertise, training, and background of many different medically trained professionals including Physicians, Nurses, Physician Assistants (PAs), and Nurse Practitioners (NPs) – each has their own skill set and expertise. Over the past 10-15 years, the number of PAs and NPs practicing in various facets of the medical field has noticeably increased. The demand to fill such positions has paralleled this trend, largely in order to supplement employment shortages in the area of primary care (family practice, internal medicine, pediatrics, and geriatrics). This increased demand on these professions has further spurred an evolution of the roles and responsibilities that PAs and NPs hold, as well as an evaluation of the future of these professionals in the medical world.

History of Physician Assistant and Nurse Practitioners

The discipline of PAs began as a group of personnel trained in combat medicine that became highly skilled and specialized as assistants to physicians during the Vietnam War. Following the close of the war, these individuals who obtained high level training on the front lines were left without jobs, yet were rich in medical knowledge and hands on experience (American Academy of Physician Assistants, 2013). At this same time, in the mid-1960s, there was a noticeable lack of medical manpower in the field of primary care medicine. In
order to provide healthcare and cover the primary care shortage, a position was created for these individuals to fill. This position became known as a Physician Assistant (PA) in the United States. Dr. Eugene A. Stead Jr., MD, of Duke University Medical Center enrolled the first class of professionally acknowledged PAs in 1965, with a curriculum that was closely aligned with Medical Doctor training and the fast paced learning environment instilled in Vietnam War medical personnel (American Academy of Physician Assistants, 2013).

Similar to the evolution of PAs, Nurse Practitioners originally evolved in response to primary care gaps and inadequate numbers of physician providers. The progression of NP development first began with the rise of nurse specializations in the 1940s-1950s including Nurse Anesthetists, Psychiatric Nurse Specialists, and Nurse Midwives (American association of nurse practitioners, 2013). As primary care gaps grew in the 1960s post Vietnam War, these specialized nurses were called upon in a similar manner as the specially trained combat medical assistants that became PAs. These specialized nurses became supplemental primary care providers when official NP training became established in 1965 by Dr. Henry Silver, M.D. and Loretta Ford, RN (American Association of Nurse Practitioners, 2013).

As these two fields have grown from the mid-1900s, their significance and role as critical members of the medical team evolved, and was acknowledged by professionals. For the first 30-40 years that these fields were incorporated into the healthcare system, PAs and NPs were viewed merely as “understudies” or
assistants of practicing physicians that were only able to operate and practice under direct physician supervision. As time has gone on, particularly within the last decade, the potential and capabilities of PAs and NPs has been embraced in most areas of medicine: ambulatory centers, hospitals, specialty groups, private practice, and, most notably, primary care (Carryer et al, 2007).

Roles and Responsibilities

When asked to describe the duties, responsibilities, or roles that PAs and NPs hold, a concise and explicit definition of these professions is quite difficult to provide. For one, PAs and NPs both practice under a wide range of diverse state laws. These state laws differ in what responsibilities they delegate to PAs and NPs (such as prescriptive powers), what boundaries PAs and NPs can practice within (direct supervision versus providing care on their own, for example), requirements and qualifications for specialty practice, and what protocols PAs and NPs are expected to adhere to in terms of providing patient care. There are, however, certain federal education requirements and licenses/certificates that must be obtained by all PAs and NPs regardless of state or field of practice (Carryer et al, 2007).
Current Profession Definitions and Public Perception

Currently, a large portion of the public cannot adequately, and correctly, describe the scope of practice in which PAs and NPs are able to provide care. As defined by the American Academy of Physician Assistants (AAPA), a PA is a “medical professional who works as part of a team with a doctor. A PA is a graduate of an accredited PA educational program who is nationally certified and state-licensed to practice medicine with the supervision of a physician” (American Academy of Physician Assistants, 2013). PAs are certified to perform routine physical examinations, make diagnoses and treat ailments, assist and even lead surgical procedures (as delegated by an overseeing physician), and make rounds in hospital and nursing home settings (American Academy of Physician Assistants, 2013). While state laws may restrict PA practice, federal law allows all PAs in the United States to prescribe medications to patients.

Nurse Practitioners, as defined by the American Association of Nurse Practitioners (AANP) are “clinicians that blend clinical expertise in diagnosing and treating health conditions with an added emphasis on disease prevention and health management” (American Association of Nurse Practitioners, 2013). Similar to PAs, NPs work in collaboration with health care professionals and perform physical examinations, order/interpret diagnostic tests, make diagnoses, and counsel patients on treatment and overall health. The most recognized difference between PAs and NPs is that not all NPs may prescribe medications. This is determined by the specifications regarding prescriptions governed by
state laws in which the NP is licensed to practice. Also, educational platforms differ in terms of training: PAs are trained based on the medical school model, while NPs are trained based on the nursing model (Physician Assistants Versus Nurse Practitioners, 2013).

During the rise of these professions, PAs and NPs have not always been regarded as autonomous medical providers. However, that is more and more what PAs and NPs have become, and many PAs and NPs practice in an autonomous fashion (particularly in primary care settings). As primary care needs have continued to grow, the autonomy of these practicing providers has also increased. Successes and patient satisfaction with care from PAs and NPs has, over time, noticeably improved, calling into discussion the ways in which the capabilities of these fields can be capitalized upon. Many healthcare professionals, patients, and administrative healthcare professionals have high hopes for expanding the depth and breadth of practice for PAs and NPs, all the while encouraging their extensive employment in primary care facilities.

**PAs and NPs in Primary Care: A True Solution?**

Although PAs and NPs may carry different titles, the initial rise of both professions stems from three basic needs of the healthcare system: to aid in the balancing of continually increasing health care costs, to correct an inefficient and inconsistent distribution of health resources, and, foremost, to quickly increase the number of health care providers in the primary care field (Health law fact
sheets, 2013). Despite this original aim, however, PAs and NPs alike have graduatedly funneled in to more specialized fields such as surgery, dermatology, orthopedics, and obstetrics/gynecology. This, in turn, potentiates the problem of primary care provider shortage.

PAs and NPs in Specialty Practice

The reasons for PAs and NPs migrating towards specialty and subspecialty positions are multi-fold. For one, higher wages that ultimately lead to quicker pay off of student loans and expenses are a principal incentive towards this employment shift. More opportunity for specialty advancement, more flexible hours in specialty practices, and higher professional regards by patients and colleagues alike may also play a part in PA and NP specialty interest. In the end, however, the solution to primary care provider shortages being filled by an increasing number of PAs and NPs is ineffective when specialty interests pull these resources away from family medicine.

Therefore, the question has now been revamped to address not who can fill primary care employment gaps, but rather how PAs and NPs can be compensated appropriately in order to draw them towards this “starving” field. As these concerns develop, and uneven redistribution of these physician extenders continues, as do the roles, expectations, and responsibilities allotted to said providers. More and more PAs and NPs are providing high levels of care to patients in specialty settings and becoming more trusted by overseeing
physicians to perform specialized examinations/surgeries/tests/etc. without direct supervision. These specialty opportunities lead to professional advancement and higher wages, a more desirable outlook than is provided in primary care.

**Continuing Primary Care Needs and the Affordable Care Act**

What complicates the situation further is that the need for primary care providers is not decreasing. Rather, with the large number of aging baby boomers requiring extensive elderly care and with a vast new population on the cusp of receiving medical benefits under new Obama Care legislation (Affordable Care Act), the demand on primary care is only expected to grow. PAs and NPs entering practice will be forced to choose between primary care or a more lucrative specialty path. Roles and individual responsibilities of PAs and NPs will surely change in response to these primary care demands, and the future of PAs and NPs will undoubtedly change as compared to what these professions call for today.

**Obama Care Potential Influence on PAs and NPs: Brief Introduction**

As abovementioned, newly enacted Obama Care legislation will become an important player in placing increased demand on primary care roles. Many of the statutes of this plan have already been enacted present day, while further reforms will begin October 1, 2013 and roll out in its entirety through the year 2022 (Health Law Fact Sheets, 2013). While this healthcare plan, also referred to
as the *Patient Protection and the Affordable Care Act*, entails many different points, the general premise behind the act comprises the following goals: to provide a greater number of Americans with affordable healthcare, to provide a quality level of care to each American, and to ultimately reduce growing health care spending nationwide (Health Law Fact Sheets, 2013).

In particular, a few of the main provisions that Obama Care plans to incorporate into this overhauled system include: requiring all insurance plans to cover preventive services provided to patients, prevention of gender discrimination with regards to service charges, prevention of allowing insurance companies to cease coverage for individuals who become seriously ill, and requirement of insurance companies to cover people with pre-existing conditions. According to (Health Law Fact Sheets, 2013), these reforms have already benefited over 100 million American citizens. It is projected that with latter laws coming in to play in October 2013 and onward, this number will only grow further.

What this means in terms of primary care is obvious: increased demand and increased pull on PAs/NPs to meet these demands. However, with a large number of PAs and NPs seeking specialty positions instead of primary care, providing sufficient manpower to meet these demands may be difficult. Incentives will more than likely have to be provided, primarily financial incentives, to draw NPs and PAs towards serving this large, diverse, and largely government-supported patient population. It is agreed by many healthcare professionals that PAs and NPs could adequately supply this role, and do so very successfully.
However, others argue that by attempting to funnel PAs and NPs into these positions, and placing restrictive measures on protocols in this field, this may inhibit the capabilities that PAs and NPs present to other fields of healthcare which are unique to these professions such as their flexibility and adaptability to changing occupational boundaries (American Academy of Physician Assistants, 2013; American Association of Nurse Practitioners, 2013).

**Evaluating the Future of PAs and NPs & Specific Aims of Paper**

This primary care dilemma, as well as the expectations and future of PAs and NPs in the face of changing healthcare standards, has been continually discussed over the past 8-10 years. The way in which PAs and NPs are viewed professionally, what these professionals are capable of contributing to a medical team, and the future roles they may carry are several issues being published and discussed amongst healthcare professionals. Of utmost importance, however, is whether an increase in PA and NP incorporation into the primary care field is truly the solution to primary care issues, or whether there are underlying problems with the system that need to be dealt with independent of filling employment gaps. Assessments of publications that address these issues, PA and NP role progression, and the projected outlook for these professionals will be evaluated in order to assess where these individuals fit into the present, and future, world of healthcare.
Published Data

Current Roles and Restrictions of Physician Assistants and Nurse Practitioners

The first article to be assessed, *The contribution of Physician Assistants in primary care: a systematic review* by Halter et al, examines the number, role, contributions, appropriateness, receptiveness, and employment distribution of PAs in the United States. It also briefly compares these appraisals to developing PA presence in other countries such as the United Kingdom, Canada, Australia, and Netherlands. The authors not only examine roles and responsibilities of PAs currently in practice, but use advanced search models to assess how many other current publications are available that discuss PA contributions in primary care in order to measure how extensive research on this particular topic actually is.

According to this systematic review of other PA related literature sources, there has been a noticeable increase in the number of PAs practicing in primary care since the 1960s when the profession began. However only 50% of the PAs work in family practice, this percentage is low compared to initial goals of the profession that was aimed at filling primary care gaps (Halter et al, 2013). In these family practice settings, PA roles largely include providing care to patients in terms of an acute patient workload, while physicians tend to take appointments
and oversee a workload with elderly patients, chronic illnesses, and complicated medical scenarios. While these appointments are not exclusively delegated to physicians, and PAs are capable of taking on this type of workload as well, this patient distribution varies by region and practice.

The roles of PAs are examined further and related to workload balance with colleagues and physicians. As aforementioned, roughly 50% of PAs currently practice in family medicine settings. In these settings, the main responsibility of PAs to see patients with acute illnesses (or “same day appointments”) is suggested to be a role that may allow physicians to focus the majority of their attention and expertise on complex patient cases. This, in turn, leaves PAs to provide more “straightforward” care to acute cases, all the while never compromising the quality of care that is expected by patients from either physicians or PAs. It is expected, according to this study, that while this is the common role that PAs may take in primary care, they will continue to be sought after to supply primary care needs and, in turn, take on more responsibility of individualized care.

In terms of productivity of PAs in primary care settings, evidence appears to be varied. Of the publications reviewed, lower productivity of PAs was reported compared to physicians, while other authors reported PAs either providing similar levels of consultation efficiency or even greater capacity/productivity of practice (Halter et al, 2013). Others reported that the efficiency of physicians with PAs in their practice increased with the incorporation of a PA into their practice (Halter et
al, 2013). This may be due to the ability to share workloads, triage patients in a more efficient fashion, and collaborate effectively. However, other reviewed publications, such as *The impact of nonphysician clinicians: do they improve the quality and cost-effectiveness of healthcare services* by Laurant et al, suggest the opposite: the presence of a practicing PA may hinder physician productivity because of the need for PAs to consult with overseeing physicians during their appointments. This may occur with less experienced PAs as residents in allopathic programs who may decrease overall efficiency (Halter et al, 2013).

Together these indicate that PAs significantly impact practice procedures and efficiency, and generally in a positive manner.

The review by Halter et al also evaluates the acceptability and receptiveness of patients to the role of PAs and treatment by these individuals. Ten studies were reviewed and the general consensus was that the vast majority of study respondents were accepting towards treatment (or potential of treatment) from PAs. For those individuals that were actually seen and treated by a PA, the level of satisfaction was very high. It was found that, even when posed with scenarios in which patients were able to see a physician without a time delay, many patients continued to elect seeing a PA instead. In this limited study on analysis of acceptability and productivity of PAs, the impact that primary care PAs have on a patient population that has also seen physicians is a positive one. Halter et al do mention, however, that there is not an extensive amount of study
information pertaining to this specific “acceptability” factor when assessing PAs, despite a generally positive report from those patients that were assessed.

Overall, the roles and perception of PAs, based on the review of 49 publications that met all inclusion criteria for this systematic review (terms physician assistant, primary care, family medicine, general practice) were consistently appreciated and accepted as contributors to primary care practices and medical teams. While opposite views were mentioned by some reviewed authors, including views that PAs can be more cumbersome on practice productivity and cost, the general view still holds that PAs can aid with workload distributions, can serve patients with a noticeably high level of satisfaction, and will continue to be supported as increased expectations and numbers rise in primary care (Halter et al, 2013).

This next article, *The Role of Nurse Practitioners in Reinventing Primary Care* by Mary Naylor and Ellen T. Kurtzman, is, similar to the previous publication, a review of sources that assess the current roles and projected capabilities of NPs in primary care today. Assessment of various literature sources provide evidence to support the significance of NP contributions to the primary care workforce, capability of expanding their roles to provide a greater degree of patient care, and impact in reducing health care costs are all examined in order to define NPs as mid-level, primary care providers.

Nurses represent the largest subset of health care providers in the United States primary care field. While there is a rapid increase in this Registered Nurse
(RN) workforce, there is also a paralleled increase in the number of advanced practice registered nurses (APRNs). Namely, the field of NP studies (a subset of APRNs) and the number of practicing NPs in primary care are on the rise. Similar to PAs, NPs mainly partake in acute patient treatment in primary care/family medicine facilities. According to Naylor and Kurtzman, roughly 70-80% of these APRNs work in primary care with 141,000 of these APRNS being practicing NPs.

With regards to the roles of NPs, they are highly diversified based on state restrictions. They work in large and small practices, schools, and clinics either as autonomous providers (depending on state of practice) or as collaborative medical team members. It is stated that NPs are high quality contributors to primary care populations, and will continue to be valued in the face of current (and growing) employment shortages (Naylor & Kurtzman, 2010). These shortages could potentially hinder the quality of care provided to patients if they are not dealt with appropriately by, for example, allowing more practice power and more responsibilities to be allotted to NPs that can allow for more respected, and acknowledged, autonomous practicing techniques. This, in turn, would increase the primary care work force, while freeing up physicians to deal with more severe/chronic cases.

Despite the continued acknowledgement of NP potential and capabilities that may be capitalized upon to add valued service to high quality primary care, barriers continue to persist that largely prevent this from happening. Carrying the most weight is that of state law scope of practice restrictions. Often restrictions
are so stringent that NPs resort to leaving highly restrictive states in order to practice in others that allow more practice “freedom” (Naylor & Kurtzman, 2010). These state laws impose limits on the roles of NPs, the prescriptive powers of these professionals, the requirements of oversight by physicians, and the day-to-day workings of NP practice. In the end, however, it is believed that such “unnecessarily” tight limitations are actually holding NPs back from being able to provide high end, comprehensive, and quality care that is permitted by professional education and licensing (Naylor & Kurtzman, 2010). These limitations, albeit imposed by each state for reasons backed by state legislative medical professionals, severely hinders the contributions that NPs may be able make to primary care services, and diminishes their ability to expand their expertise in other potential areas of need. Nationwide standardization of state enforced NP restrictions seems to be a potential start to breaking down this barrier, yet deeper issues, including professional tensions and mutual respect of practice may be the deeper issue at hand (Naylor & Kurtzman, 2010).

These professional tensions, which undeniably exist and continually fluctuate between physicians, NPs, and PAs, also contribute to the opposing force of expanding the NP scope of practice. It is suggested that this sometimes “tug of war” between physicians and mid level providers exists due to a power struggle in uneven monetary reimbursement and overseeing professional practice (Naylor & Kurtzman, 2010). Resistance to recognizing NPs as autonomous providers in practices that are typically run and controlled by
physicians further exacerbates the situation in which the NP scope of practice and professional potential is thwarted.

A third obvious barrier that seems to be holding NPs back from reaching their practice potential is the reimbursement policies currently in place for the same services provided by NPs and other mid level providers versus physicians. Typically, for example, services billed through Medicare and Medicaid reimburse NPs roughly 75-85% of what is paid to physicians for the cost of same services rendered (Naylor & Kurtzman, 2010). Following assessment of quality of care received by patients for comparable services by both NPs and physicians, the difference was negligible. Therefore, it is proposed that these reimbursements policies be looked at in detail, reassessed, and possibly revamped in order to meet the potential greater scope of practice that NPs can undertake (Naylor & Kurtzman, 2010).

Naylor and Kurtzman ultimately go on to suggest prospective solutions to the abovementioned barriers. Firstly, it is suggested that restrictions imposed on NP practice, despite adequate education and licensing, shall be revised in order to ensure that NPs can practice within the expanse of their licensures. Unnecessary limitations, at both the state and federal level, tend to restrict NPs to practice in a smaller scope of practice than they are formally educated, trained, and licensed to do. Similarly, it is suggested that these restrictions, once loosened, should be standardized across all states in order to support a collaborative and supportive NP network nationwide.
Another solution includes equalizing payments in terms of reimbursement for NP versus comparable services provided by physicians. This would, in turn, attempt to equalize and level the professional field on which physicians and NPs (as well as other mid level professionals) provide high quality primary care in terms of diagnostics and test ordering. Through monetary acknowledgement of equal services performed by NPs and physicians alike, the acknowledgement and value of the practicing potential of NPs can be further acknowledged in hopes of incorporating said abilities into current practice (Naylor & Kurtzman, 2010).

Finally, through increasing the accountability of NP actions and contributions to primary care services, this information can be relayed to consumer populations for increased awareness of current, and future, roles of NPs in the ever-demanding world of primary care medicine. Overall, Naylor and Kurtzman have identified NPs as critical members of the current primary care system. The barriers holding NPs back from reaching their potential in providing high quality primary care are asserted, then followed up with solutions that may aid in diminishing the obstacles that NPs face in expanding their scope of practice. In general, however, a similar message exists for NPs and other mid level providers (such as PAs): they are valued providers, with high satisfaction rates from patients, and will continue to be sought after in primary care employment (Naylor & Kurtzman, 2010).
Physician Assistants and Nurse Practitioners: Education, Statistics, Affordable Care Act, and Future Projections

While the previous articles addressed the current roles, barriers, and restrictions placed on currently practicing PAs and NPs, *Physician Assistants: From Pipeline to Practice* by Anita Duhl Glicken and Anthony A. Miller explores the education, statistical information regarding PA employment/practice distribution, and future expectations/contributions of PAs in the face of newly enacted Affordable Care Act (Obama Care) legislation. These numbers and trends will provide insight into the progression of the PA profession, its projected direction of growth, and response to healthcare reforms and increasing demands.

Glicken and Miller begin by assessing the PA educational programs nationwide in number and degree of training. Workforce data was collected from the Physician Assistant Education Association (PAEA) and the nccPA Health Foundation, a supporting organization to the National Commission on Certification of Physician Assistants (NCCPA), which examined PA candidates (pool of initial applicants), current PA educational programs, current PA students enrolled, and certified/practicing PAs (Glicken & Miller, 2013). Applicant data (2011-2012 published data) was also drawn from the Central Application Service for Physician Assistants (CASPA), an application service that 150 (88%) of the 173 accredited United States PA programs utilize (Glicken & Miller, 2013).
The applicant pool to accredited PA programs has increased significantly since the early 2000s. In fact, the annual applicant population has increased from 11% to 20% since 2007, with 19,786 applications being received by CASPA in 2013 alone (Glicken & Miller, 2013). However, there was only a 6% increase in the past year. This has raised some concern over whether there will be a large enough applicant pool to provide for the primary care shortage (Glicken & Miller, 2013).

As aforementioned, 173 fully accredited PA programs currently exist in the United States. It is projected that at least 65 other programs will become established and apply for provisional accreditation by the year 2016 (Glicken & Miller, 2013). In addition to an increased number of PA programs opening and gaining accreditation, a similar trend is seen in the climbing number of PA graduates entering the PA workforce. In 2011, roughly 6,545 graduates began work as accredited PAs – this number is expected to increase by approximately 72% by the year 2025 (Glicken & Miller, 2013). This increasing graduate output trend is displayed below, dating back to 1984 when formal PA education and training data collection began (Figure 1).
Figure 1. Increasing number of graduates from accredited United States PA programs sorted by graduation year. The vertical line delineates the start of the projected growth trend reaching 2017. Figure amended from: Physician Assistant Education Association. Twenty-Seventh Annual Report on Physician Assistant Educational Programs in the United States, 2010-2011. Alexandria, VA: Physician Assistant Education Association; May 2013.
In Figure 2 below, the distribution of PAs age-wise (of those that responded to the survey) shows that the majority of practicing PAs fall in the lower age bracket of 25-40 years.

**Figure 2.** Distribution of practicing certified PAs by age. Percentages are calculated based on responses from 54,982 PAs. Figure amended from: Physician Assistant Professional Profile. National Commission on Certification of Physician Assistants (NCCPA) 2012 Certified Physician Assistant unpublished data.
The trends in both Figures 1 and 2 bode well for the anticipated increase in primary care demands and employment gaps in this field that can be filled with this increasing number of PA graduates, and a younger PA demographic that will be in practice for a longer period time before considering retirement (Glicken & Miller, 2013).

Despite the quite obvious trend of increasing PA educational programs and successful graduate growth, Glicken and Miller note that incorporating these qualified PAs into the workforce may be hindered by several factors including: clinical site shortages and subsequent competition for clerkship slots, diminishing faculty due to a migration of educational providers back to active practice status, and earlier retirement of curriculum based educators/clinical center educators. This could potentially impede the expansion of PA program class size, as clinical sites and staff would be inadequate to serve a larger student population, and, in turn, hinder primary care services that said PAs could provide (Glicken & Miller, 2013).

In addition to shrinking numbers of clerkship preceptors and faculty shortages, shifts of PAs from primary care to specialty and subspecialty areas of practice have also contributed to furthering primary care manpower deficiencies. As PAs practice with the oversight of their physicians, an increasing amount of autonomy is granted and delegated to these individuals. These individuals, in turn, begin to follow similar patterns as their physician colleagues in terms of making a shift towards specialty practice and, hence, away from primary care.
According to Glicken and Miller, just over 33% of currently practicing PAs report primary care as their active arena of practice including internal medicine, family practice, pediatrics, and geriatric medicine. In a profession that was initially formed to serve as a primary care supply, changes in education, specialty opportunities, and abilities of PAs to expand their expertise into other medical areas have reformed what a PA is today. Therefore, these changes must be embraced, and PAs must not be solely relied on as a solution to primary care needs, especially in the face of recent Affordable Care Act implementation that will vastly, and relatively rapidly, expand the population of insured individuals seeking primary care services (Glicken & Miller, 2013). With this said, however, the flexibility of the PA profession as compared to their physician counterparts allows for movement between specialties and shifts to areas of medicine is which provider power is needed. Appropriate incentives and compensation would need to be provided in order to pull PAs from specialty practice to, for example, currently lower paid primary care positions.

In terms of the future influence of PAs in the medical workforce, the general trend of PA growth and increased demand for their services is again reiterated. PAs presently make up 10% of the primary care workforce, and, as stated by Glicken and Miller, PAs make important contributions to physician led medical teams as long as PAs are permitted to work within their fully licensed scope of practice. Further, shorter time frames of educational programs allow PAs to enter the demanding primary care workforce at a much faster rate. These
shorter programs, in turn, lead to PA graduates beginning careers with less accrued education related debt. Finally, the educational programs in which PAs are trained embody the flexibility of the profession in practice. The overarching generalist educational approach trains PAs to be very adaptable, quick-adjusting healthcare professionals that are able to migrate between specialties and primary care as healthcare demands change (Glicken & Miller, 2013). As previously mentioned, this PA characteristic is one that is expected to be capitalized upon as aging populations are increasing and those newly insured under the Affordable Care Act quickly seek care.

In all, the future of the PA profession and the contributions of these providers to the current healthcare system rely largely on three key factors: the continuing rise of applicants to the growing number of accredited PA programs, recruitment and retention of PA school faculty members to meet the increasing number of PA students expected to enroll in these expanding programs, and loosening of national and state legislative measures that currently restrict PAs from practicing to their full capacity (Glicken & Miller, 2013). Initiatives have already begun in order to attract applicants and staff both to pursue PA education and preceptor roles, respectively. These, quite obviously, include monetary benefits to staff members – it remains to be seen how this will impact student interest/ability to afford PA school attendance (Glicken & Miller, 2013). Finally, increased research, literature, and petitioning to legislative powers that emphasize the capabilities of PA professionals and their contributions if allowed
to practice to their fullest have begun to lead to statewide reform of restrictive PA laws. The ultimate goal is to be able to convey that taking advantage of PA flexibility to legislative bodies, all the while finding ways to allow overseeing physicians to appropriately and safely delegate responsibilities to PAs in order to increase quality, efficient, high end primary care services (Glicken & Miller, 2013).

*Nurse Practitioner Workforce: A Substantial Supply of Primary Care Providers* by Poghosyan et al is similar to the paper previously reviewed, and evaluates the NP profession in terms of education, practicing NP statistics, newly enacted healthcare reform (Affordable Care Act), and predicted contributions of these professionals in the future. Comparable to the trend noticed with PAs, the NP workforce has grown steadily over the past decade, in particular expanding practice largely in primary care settings. According to Poghosyan et al, roughly 65% of all NPs are employed in primary care or ambulatory settings. They also make up, in total, about 20% of the entire primary care healthcare workforce (Poghosyan et al, 2012). According to Poghosyan et al, with data retrieved from the 2011-2012 Pearson Report, there are 180,233 NPs currently practicing in the United States. As aforementioned, the demand on NPs is certainly expected to increase and, it is predicted, that the number of practicing NPs will grow 130% until the year 2025 (Poghosyan et al, 2012).

With regards to NP education, a similar trend to PA programs has been noticed: an increase in number of programs being accredited, expansion of
existing programs in terms of increasing class size, and hence an increasing number of graduates entering the workforce than in previous years. It is stated that this increasing number of NPs being produced can be exploited to help supply primary care needs, in particular the roughly 32 million patients who will have insured access to primary care once President Obama’s Affordable Care Act is fully implemented (Poghosyan et al, 2012).

Not only can NPs be used to attempt to supplement primary care needs, and will tend to do so in greater numbers than PAs due to flexibility of specialty migration for PAs, but it is projected that by supplanting physicians with NPs as the main primary care providers instead will cut costs drastically. To give an example of this, Poghosyan et al quote a prediction from the RAND Corporation that estimates the state of Massachusetts could save between $4.2 and $8.4 billion over the course of ten years. More cost effective care allows for funds that would have originally been funneled to primary care physicians, who require higher wages and service reimbursements, to be routed to other areas of healthcare that are in financial need (Poghosyan et al, 2012).

Poghosyan et al go on to further explore the Affordable Care Act and the effects that said legislation will have on NPs in the future. The Affordable Care Act aims to increase accessibility to a high standard of care, all the while emphasizing cost effectiveness, disease prevention, quality acute illness treatment, and management of chronic disease. It is stated that these are all areas of medicine heavily emphasized in NP education, further adding more
significance and value to what NPs can contribute to revamped primary care under the Affordable Care Act (Poghosyan et al, 2012). In addition to adding more support and importance to NPs role as primary care providers, the Affordable Care Act will allot $50 million for Nurse-Managed Health Centers (NMHCs). These centers are intended to provide leadership roles for NPs, to provide a facility where medicine can be practiced based on important nursing philosophies including patient-centered care, and to mainly provide primary care services to underserved areas/vulnerable patient populations (Poghosyan et al, 2012).

Further, the Affordable Care Act will promote the autonomy of NP practice and, in turn, promote billing for services under the name of NPs themselves versus physicians who they may practice with. This development will then allow for tracking of services provided by NPs, assessment of quality of care administered by these professionals, and eventual collaboration of data to present to the public in order to support growing NP professionalism and scope of practice (Poghosyan et al, 2012). In order to keep up with the increasing primary care demands that the Affordable Care Act will inevitably pose, there are provisions included that increase funding for NP education and residency training programs. While all of these future implementations support NP recognition and value as primary care providers, a problem is still posed in that reimbursements from major insurance companies (namely Medicare and Medicaid) will return a lower percentage to NPs than physicians for comparable services and quality of
care. As is a similar case for PAs, it will be a goal of both professions to rally for expansion of scope of practice and, in turn, monetary reimbursements for identical services in which they are fully licensed to provide to the same degree as physicians (Poghosyan et al, 2012).

In terms of what the future holds for the NP profession and what roles they will fill, the abovementioned Affordable Care Act will increase demands on these valued primary care providers. In order for NPs to be used most effectively to serve in this role, regulations on scope of practice should be standardized across all states, primary care environments need to be made conducive and accepting of NP practice, and public perception of quality of care provided by NPs needs to continue to be cultivated in a positive light (Poghosyan et al, 2012). In particular, if scope of practice laws are unified amongst all states, overall expansion of the NP workforce will be more uniformly supported, NP educational programs will be evenly sought after versus more students enrolling in states with less restrictive practice laws, and in turn there will be less likelihood of regional primary care depletion (Poghosyan et al, 2012).

In all, like PAs, NPs are on the upsurge in terms of applicants to schools, number of graduating students entering the workforce, size of educational and residency programs, number of NPs entering primary care fields, and demand on these and future resources to meet primary care demands. Obstacles, including reimbursement policies, restrictive scope of practice laws, and professional acknowledgement, do however exist and may hinder the growth of the profession
in terms of providing the highest degree of quality care possible (Poghosyan et al., 2012).

Discussion

The roles of PAs and NPs have drastically evolved since each profession was initially founded. Numbers have quite obviously grown in terms of these practicing healthcare professionals, roles and responsibilities of each have evolved in response to health care reform and patient population needs, and the future of each profession is one that is expected to change the face of primary care. Of all the literature pieces reviewed, this overarching theme is echoed continually.

The breakdown of PAs and NPs, according to data collected in the year 2010, can be seen side by side in both Table 1 and Figure 3 below, adapted from the U.S. Department of Health and Human Services Agency for Healthcare Research and Quality website (The number of nurse practitioners and physician assistants practicing primary care in the United States, 2011). The distribution of each profession as a whole, percentage of the whole profession practicing primary care, and the actual number of PAs and NPs practicing primary care in the United States is listed in Table 1. Figure 3 presents a pie graph of the percentage of persons practicing in primary care versus subspecialty practice.
### Table 1.

<table>
<thead>
<tr>
<th>Provider type</th>
<th>Total</th>
<th>Percent primary care</th>
<th>Practicing primary care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse Practitioners</td>
<td>106,073</td>
<td>52.0%</td>
<td>55,625</td>
</tr>
<tr>
<td>Physician Assistants</td>
<td>70,383</td>
<td>43.4%</td>
<td>30,402</td>
</tr>
</tbody>
</table>

Table 1. Estimated number of NPs and PAs practicing primary care in the United States as of 2010. Table amended from U.S. Department of Health and Human Services: Agency for Healthcare Research and Quality, 2010.

### Figure 3.

Percentage of NPs and PAs practicing in primary care versus subspecialty care as of 2010. Figure amended from U.S. Department of Health and Human Services: Agency for Healthcare Research and Quality, 2011.
These numbers, already on the upswing, will continue to grow in response to primary care demands imposed by aging populations, newly insured individuals under current healthcare reforms such as the Affordable Care Act, and as physician shortages are emphasized due to these factors. It is expected that, by 2025, PAs and NPs will almost entirely replace the primary care workforce in the United States, while physicians will migrate towards more specialized care of patients with severe and chronic illnesses (Poghosyan et al, 2012). Practices that focus on acute illness appointments, therefore, will be where PAs and NPs are expected to be seen practicing in the greatest numbers over the next decade (Poghosyan et al, 2012).

Despite these growth expectations, barriers and obstacles exist that presently prevent PAs and NPs from practicing to their greatest abilities. Unnecessarily stringent state restrictions, which are not uniform across all states, limit the scope of practice for PAs and NPs. Some of these limitations are so strict that PAs and NPs are not even practicing within the fullest extent of their formal educational training and licensures. The question then becomes: how are these sources supposed to be the “solution” to primary care employment shortages if they are not able to practice to their fullest capabilities?

Effectively, it can be deduced that this primary care “solution” cannot become reality without a major overhaul of the healthcare system with regards to PAs and NPs and their currently accepted roles by the public and physicians alike. Professional tensions between physicians and PAs/NPs should be
mediated by fostering a workplace that emphasizes medical team perspectives and collaboration of ideas to provide the highest quality of patient care. Once professional tensions dissipate in medicine (primary care, specialty and subspecialties, ambulatory settings, research, hospitals, etc.), then PAs and NPs, may be appreciated for their extensive, and flexible, qualities that they bring to the medical team. Instead of professional power struggles existing between physicians and these other “mid-level” providers, an embracing environment should prevail to create a team mentality towards reaching a quality healthcare goal.

If professional inequalities are removed, this could, in turn, pave the way for readdressing the firm state laws in place that currently hinder PA and NP professional growth by eliminating opposition from physicians/medical legislative powers. By allowing this to happen, PAs and NPs may potentially be able to practice more autonomously, with even higher regard for their services by the public, and serve as at least a portion of the solution to rising primary care demands.

In addition to the barriers that hinder NP and PA growth, and hence maximal utilization in primary care medicine, there exists the issue of NP and PA migration towards specialty and subspecialty practice versus retention in primary care. Specialty practice has its own appeal, in particular to newly emerging PAs and NPs, including: higher wages and thus quicker student debt pay off, usually a higher degree of professional acknowledgement, and increased flexibility of
practice (Halter et al, 2013). In order to draw PAs and NPs towards primary care, which is and will continue to be in high demand, appropriate compensation must be provided. This not only includes monetary benefits in terms of wages, but also potential for equal reimbursement percentages for comparable quality services that physicians provide. Figure 4 below represents this noticeable trend in increasing wages, yet these numbers are thought to continue to grow in order to retain PAs and NPs in primary care where they are increasingly needed. The jump in salary of over $20,000 for each provider type is indicative of the growing importance and value of PAs and NPs in medical practice, and increasing incorporation into medical teams (Stempniak, 2013). Other initiatives towards loosening state restrictions on PA and NP practice, allowing them to practice to their fullest and enter leadership positions in primary care practices, may also serve to increase PA and NP motivation to practice in primary care. The question still persists, however, if exploiting the number, expertise, and flexibility of these professions will actually meet the primary care demand to ensue during Affordable Care Act execution.
Figure 4. Increasing salary trend of PAs and NPs. The uppermost line represents PAs and the lower line represents NPs. Figure amended from The National Salary Survey of Nurse Practitioners and the American Academy of Physician Assistants National Physician Assistant Census Reports, 2012.
Roles and responsibilities of NPs and PAs will continue to be ever-evolving – the flexibility of these professions, the fast-paced adaptive skills that are a hallmark of PA and NP training, and the developing perception of value added to these providers (both public and interprofessional) will continually shape who and what NPs/PAs are in the medical world. If physicians shift out of primary care and PAs/NPs take on the main role as these providers, then increased autonomy of practice may follow. This, in turn, would lead to a greater amount of data available to be assessed and provided to the public on the productivity, quality of care, and scope of practice of NPs and PAs. Further, perceptions and acceptance, albeit already positive in terms of public feedback about care received from PAs/NPs, will likely increase in positivity. As a result, increased trust may be gained from patients that proper quality care is being received from both groups of professionals.

The number of educational programs, and expanding class size of existing programs, will also contribute to a larger PA and NP workforce entering the medical field. Coupled with potential incentives, such as grants for NP and PA education under Affordable Care Act legislation, a greater number of graduates could be produced and funneled into primary care where manpower is needed. While all signs surely point to increased PA and NP practicing presence in primary care, the fact of the matter is that this trend remains to be seen depending on how the Affordable Care Act actually pans out, how many newly
insured individuals actually seek out care, and how much the primary care demand actually increases as it is projected to.

**Conclusion**

It cannot be reiterated enough how PAs and NPs will become major contributors to medical practice, in particular primary care, over the next decade or two. Current roles and perceptions place PAs and NPs in less autonomous roles, and more so in specialty practice than in primary care settings (Figure 3). This is expected to change once the Affordable Care Act is in full effect and requires the services of healthcare professionals in primary care. What must be considered through evaluations of the roles and responsibilities of PAs and NPs, however, is that how the roles, expectations, value, and scope of practice of these professionals will change is truly unknown. Projections based on statistics, past models, and predictions of how the Affordable Care Act will impact PA and NP workforce distribution can surely make credible estimations of future outcomes, but not matter-of-fact ones.

As aforementioned in each of the articles reviewed, barriers and obstacles exist not just to growth of the profession for PAs and NPs, but also barriers to the expectations of legislative powers that are depending on PAs and NPs to fill in physician shortages in primary care. While these two professions seem to be the obvious, well qualified selections to fill this role, who is to say that NPs and PAs
will want to? Incentives should be provided. Wages should be appropriate to meet the demands of NPs and PAs, especially those fresh in to practice, to be able to live and pay off student debt. Reimbursement policies for medical services should be readdressed, especially for major insurance companies such as Medicare and Medicaid. Professional acknowledgement and mutual respect amongst medical team members, including physicians, should be fostered in order to cultivate smooth-running primary care practices. Most importantly of all, PAs and NPs should be allowed to practice within their entire scope of practice for which they are licensed: state regulations will change, responsibilities delegated to PAs and NPs must reflect the abilities of these professionals, and trust must be encouraged between medical team members as well as the patients that will likely be seeing PAs/NPs for their primary care needs over the next decade and onward.

In taking these issues into consideration, this anticipated shift of reliance on to PAs and NPs for nationwide primary care services, particularly in the face of the Affordable Care Act, will not occur without such drastic changes mentioned above. Surely, the increasing PA and NP workforce bodes well for tapping a supply of adequate primary care providers, but one has to anticipate that these professionals will not be willing to take said positions without proper compensation, wage-wise and professionally. Over the next two decades, as the Affordable Care Act rolls out in its entirety, the true impact of this health care reform on PAs and NPs will surface and the predictions that are being made (and
publish) will be tested. The PA and NP profession will surely increase in size and depth, yet their true contributions to increasing primary care demands are yet to be seen.

Future Plans

To track how the PA and NP profession grows, and in particular plays a role in primary care during the unfolding of the Affordable Care Act, data could be obtained in terms of: productivity, number of patients seen daily, percentage of primary care population being cared for by PAs and NPs, number of newly graduating PAs and NPs entering primary care versus specialty practice, number/size of PA and NP educational programs, salary changes, reimbursement changes, and overall number of PAs and NPs practicing in primary care settings based on year. Measuring these factors, and comparing them to values obtained prior to Affordable Care Act implementation, would aid in assessing whether PA and NP influence in primary care truly panned out as predicted in the current literature.
REFERENCES


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Education

Boston University School of Medicine, August 2012 - Present
Candidate, M.A. in Medical Sciences

James Madison University, August 2008 – May 2011
Bachelor of Science
Major: Biology
Cumulative GPA: 3.849
Transferred from Virginia Tech after freshman year

Old Dominion University, June 2009 – August 2009
Non-degree Seeking
University Physics I and II Completed
Cumulative GPA: 3.2

Virginia Polytechnic Institute and State University, August 2007 – May 2008
Non-degree Seeking
Major: Biology
Cumulative GPA: 3.5

Research

Undergraduate Research; Comparative Mycobacteriophage Genomics & Isolation of Novel Phages

- Undergraduate Independent Researcher under a mentor
• Purpose of project was to isolate, identify, and ultimately sequence novel mycobacteriophages that infect *Mycobacterium smegmatis* as a model organism to eventually study other virulent mycobacterial species that cause disease (ex: Buruli ulcer, *Mycobacterium ulcerans*); may use these phages to treat bacterial disease as an alternative to antibiotics in the future
• Worked with other lab members to collaborate results, review relevant literature, and give a presentation on this research at JMU’s Biosymposium seminar in May 2011

**Employment**

Bayview Physician Services, June 2011 – August 2012

• Medical Receptionist and Records Associate
• Exposure to private medical practice
• Served the needs of a diverse patient population
• Coordinated appointments, referrals, and medication requests
• Assisted physicians and nurse staff with patient care
• Handled insurance policies and billing for medical services

Southeastern Virginia Training Center, May 2008 – December 2008

• Direct Care Professional I for intellectually and physically disabled residents
• Completed four weeks of 40 hour per week training
  o CPR
  o Behavioral Management
  o Medication management and side effects
  o Physical restraints
  o TOVA (specialized movement of disabled residents)
  o Basic first aid administration
  o Medical and behavioral documentation
• Provided day to day care and support to residents

**Teaching Assistant Experience**

BIO 214: Cell and Molecular Biology Laboratory Teaching Assistant
James Madison University, August 2009 – December 2009
• Assisted students with assignments and laboratory practices
  o Proper pipetting techniques
  o Plasmid mapping
  o Enzyme assays
  o SDS Page gels and Agarose Gel Electrophoresis

BIO 124: Ecology and Evolution Laboratory Teaching Assistant
James Madison University, January 2009 – May 2009
• Assisted students with assignments and laboratory practices
  o Project design for Photosynthesis experiments
  o Provided tutoring
• Assisted in laboratory set up and take down for student experiments

Honors and Awards

• Graduated with Honors, Magna Cum Laude from James Madison University, May 2011
• Excellence in Biology Award, awarded to top five students with the highest GPAs of all Biology major undergraduates at JMU, May 2011
• Excellence in Biology Scholarship ($100), May 2011

Volunteer Activities

Special Olympics, March 2013 – Present
• Gymnastics coach
• Summer Games 2013 Planning Committee

Boston Medical Center – Radiology Department, March 2013 – September 2013
• Patient volunteer
  o Assist patients in directing them to correct locations for appointments, answering questions regarding wait times, and general patient assistance with needs and concerns.