Half a century of research definitively demonstrates that nurse practitioners (NPs) provide high-quality primary, acute and specialty health care services across the lifespan and in diverse settings, including NP-owned practices. NPs have graduate-level education, with master’s or doctoral degrees, and possess the knowledge and clinical competency to provide health care beyond their initial registered nurse preparation. As clinicians who blend clinical expertise in diagnosing and treating acute and chronic health conditions with an added emphasis on disease prevention, health management and patient education, NPs bring a comprehensive perspective to health care.

Since the NP role was established in 1965, research has consistently demonstrated the excellent outcomes and high quality of care provided by NPs. The body of literature supports the position that NPs provide care that is safe, effective, patient-centered, efficient, equitable and evidence based. Furthermore, NP-delivered care is comparable in quality to that of their physician colleagues, demonstrated by numerous studies that conclude no statistically significant difference across outcome measures. Research has found that patients under the care of NPs have fewer unnecessary hospital readmissions, fewer potentially preventable hospitalizations, higher patient satisfaction and fewer unnecessary emergency room visits than patients under the care of physicians. This paper summarizes several empirical, peer-reviewed articles supporting the quality of NP practice and is presented in two sections: 1) original research and 2) systematic reviews and meta-analyses. These references are listed as an annotated bibliography.

Section I. Original Research


Borgmeyer et al. evaluated the perception of pediatric nurse practitioners (PNPs) as a direct patient care manager and the pediatric patient outcomes (e.g., length of stay [LOS], cost, readmission rates) between Asthma Intervention Model (AIM) PNP-managed patients, intern-managed patients and peer children’s hospitals. Physicians, nurses, pediatric interns and families were surveyed about their experiences between July 1, 2003, and July 30, 2004. The authors concluded that PNPs were effective educators and managed patients appropriately. A comparison of AIM PNP-managed patients and intern-managed patients showed no significant difference in LOS or cost. None of the patients in either group experienced readmission.


Quality of care administered by primary care nurse practitioners (NP PCPs), primary care physicians (MD PCPs) or both types of clinicians was examined using 2012 and 2013 Medicare part A and part B claims. A retrospective cohort design using standard risk-adjustment methodologies and propensity score weighting assessed 16 claims-based quality measures, which were grouped into several primary care domains: chronic disease management, preventable hospitalizations, adverse outcomes and cancer screening. Buerhaus, et al. found that beneficiaries treated by NP PCPs had lower rates of hospital admissions, readmissions and inappropriate ED use, as well as low-value imaging, as compared to PCMDs or jointly attributed clinicians.


To compare quality indicators of Medicare beneficiaries managed by PCNPs and PCMDs, DesRoches, et al. used a retrospective cohort design that examined 2012 and 2013 Medicare claims for three subpopulations among beneficiaries: qualifying due to disability, dually eligible for both Medicare and Medicaid, and disabled and eligible for both programs. Overall, the authors found that beneficiaries managed by PCNPs had a lower risk of preventable hospitalizations and a reduced use of emergency room services and other health care resources.

Using electronic health record data from the Veterans Health Administration (VHA), Everett et al. examined differences in diabetes outcomes among 609,668 patients being treated at primary care clinics by physicians, PAs and NPs serving in both primary care provider (PCP) and supplemental provider roles. Outcomes were examined for patients who experienced care provided by medical doctor (MD) PCPs, PA PCPs, NP PCPs or combinations of PCPs with supplemental providers. Everett et al. found no clinically significant differences in intermediate diabetes outcomes (e.g., A1C, Systolic BP, LDL-C) between provider groups, regardless of their role as usual PCP or supplemental providers.


To improve the delivery of care, patient-centered medical homes often rely on a team of clinicians with common goals and defined roles. Everett et al. examined Medicare data from a large physician group to compare the outcomes of two groups of adult Medicare patients with diabetes at various levels of complexity who received primary care from PA and NP teams and physician-only teams. Everett et al. found that most PA and NP outcome measurements were comparable or better than physician-only care.


This study addresses whether the integration of acute care nurse practitioners (ACNPs) in a "semiclosed" critical care delivery system would increase clinical practice guidelines (CPGs) compliance. It was conducted in two phases, in which 1,380 admissions took place at the surgical intensive care unit (SICU) at the Hospital of the University of Pennsylvania. During Phase 1, patients were admitted to the "mandatory consultation"/non-ACNP team (standard care) or to the "semiclosed"/ACNP team (new model) (January-May 2003). During Phase 2, surgical critical care service (SCCS) teams crossed over to the "semiclosed"/ACNP model (June-December 2003). Critical care patients were prospectively assigned to a NP or non-NP team. Findings indicate that CPG adherence was significantly higher among patients assigned to the NP team.


Jackson et al. wanted to examine whether any differences existed in intermediate diabetes patient outcomes between physicians, NPs or PAs within a primary care setting. The authors conducted a cohort study using administrative data from the U.S. Department of Veterans Affairs (VA) electronic health record. The sample included 368,481 patients from 568 VA primary care facilities. Jackson et al. did not find any significant differences in diabetes outcomes across provider groups, providing further evidence that NPs, PAs and MDs provide comparable care.


To compare the quality of care in prescribing practices between physicians and NPs, National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey data from 2006-2012 was analyzed using serial cross-sectional analysis. There were no differences in 10 out of 13 prescribing practices across clinical practice settings between NPs and physicians after analyzing 8.33 billion ambulatory patient visits. NPs had two significantly better prescribing practices and one significantly, but not clinically relevant, lower prescribing practice compared to physicians. NPs’ prescribing practices across specialties are equitable to those of physicians.

To expand upon previous studies conducted that examine patient satisfaction among NPs and MDs, the authors analyzed responses from the Consumer Assessment of Healthcare Providers and Systems survey (n=53,885), which included several provider types: NP, MD, doctor of osteopathy and PA. Kippenbrock et al. found that patient satisfaction was higher for NPs than other provider types.


Using data from a national sample of 64,354 Medicare beneficiaries, a retrospective cohort study was used to compare process and cost of care for patients with diabetes mellitus in 2009 who had received primary care from an NP or an MD PCP. The authors concluded that low-density lipoprotein cholesterol testing and nephropathy monitoring rates were similar between both provider types. There was no statistically significant difference in adjusted Medicare spending between NPs and MD PCPs.


The rate of potentially preventable hospitalizations of Medicare beneficiaries with a diagnosis of diabetes were compared between patients of NPs and physicians. Patients with a diagnosis of diabetes between 2007 and 2010 (n=345,819) who received all primary care from an NP only or a physician only were selected from a sample of Medicare beneficiaries. The NP cohort and physician cohort were selected from national Medicare data using diabetes indicator data from the CMS Chronic Disease Data Warehouse, while additional data was captured by administrative claims. Several statistical methods demonstrated that receipt of care from NPs decreased the risk of potentially preventable hospitalizations. These findings suggest that NPs are exceptionally effective at treating diabetic patients.


The authors compared the quality of care and practice patterns of NPs, PAs and MD PCPs within community health centers (CHCs) using data from the National Ambulatory Medical Care Survey (2006-2011). Analyses were composed of 23,704 patient visits to 1,139 practitioners within CHCs, examining nine patient-level outcomes, such as smoking cessation, depression treatment, statin for hyperlipidemia and imaging services. Findings suggested that NPs were more likely to provide recommended smoking cessation counseling and more health education, as compared to MDs; however, no significant differences were found in any other outcome measure examined across provider groups.


A prospective cohort study of adult medical intensive care unit (ICU) admissions at an academic tertiary care center was conducted between 2011 and 2013. Landsperger et al. compared 90-day survival rates between care administered to patients by ACNPs and resident teams using Cox proportional hazards regression. Among the 9,066 admissions the study addressed, patients cared for by ACNPs had lower ICU mortality rates and shorter lengths of hospital stays. Hospital mortality and ICU length of stay was similar between the two providers.


The purpose of this study was to collect follow-up data from a randomized trial described in Mundinger et al. (2000), which compared outcomes of patients seen by an NP versus those seen by a physician. Eligible participants were interviewed by mail, phone calls or home visits. Data was also collected from medical center billing records for the two-year period after the initial visit. No significant differences were found between the two groups in self-reported health status; satisfaction; disease-specific physiologic measures; or use of specialist, emergency room or hospital care. However, physicians’ patients had a higher average primary care utilization than NPs' patients.
USE OF TERMS SUCH AS MID-LEVEL PROVIDER AND PHYSICIAN EXTENDER

Discussion Paper:
QUALITY OF NURSE PRACTITIONER PRACTICE


The authors examined differences in utilization, cost and clinical outcomes between NP-assigned patients and MD-assigned patients. VA administrative data containing the characteristics, outcomes and provider assignments of 806,434 patients from 530 VA facilities assigned to an MD PCP who left their position within the VA in 2010 and 2012 was used. To compare patients reassigned to MD and NP PCPs, a difference-in-difference approach was selected. Liu et al. found that patients assigned to NPs were less likely to utilize primary care, specialty care and inpatient services; had no difference in costs; and experienced similar chronic disease management compared to MD-assigned patients.


Lutfiyya et al. wanted to examine if Medicare patients who received primary care Type 2 diabetes (DM2) management differed in scope and outcomes by provider type: NP or physician. A cross-sectional quantitative analysis of 2012 U.S. Medicare National Claims History, also known as the 5% Standard Analytic File (SAF), was conducted. For patient comparison, a medical productivity index (MPI) was used to stratify Medicare DM2 patients, which was defined by the least healthy and most healthy patients. Lower cost and better quality of care was attributed to chronic care patient management by NPs.


The authors used National Ambulatory Medical Care Survey (NAMCS) data and National Hospital Ambulatory Medical Care Survey (NHAMCS) data from 1997 to 2011 to compare the use of low-value services (e.g., upper respiratory infections, back pain and headache) commonly seen within the primary care setting. Comparisons were made between advanced practice providers (APPs [NPs and PAs]) and physicians. The authors found that both clinician groups provided equivalent low-value services.


Melillo et al. investigated the differences in NP and physician practice models in long-term care (LTC) nursing facilities. The data for this study was taken from the Medicare Current Beneficiary Survey for the years 2006–2010, and the comparison cohorts consisted of patients who received all primary care (PC) from an MD or patients who received PC from an NP during the year reported. The reported health status of patients did not differ between comparison groups; however, the cohort with NP involvement had higher completion rates of advance directives than the MD-only cohort. The authors suggested that “By having a higher completion rate of do not resuscitate [DNR] orders, the inclusion of NPs in LTC nursing facility care teams potentially increases resident quality of life and reduces the cost of care by minimizing the use of costly, unwanted treatments.” Overall, NPs provided comparable care to that of MDs in LTC facilities.


Muench et al. used weighted propensity score matching combined with logistic regression to examine differences in good medication adherence, office-based and specialty care costs, and ER visits between patients seen by NPs and those seen by MD PCPs, using Medicare Part A, B and D claims between 2009 and 2013. The three drug class cohorts for analysis consisted of anti-diabetics, renin-angiotensin system antagonists (RASA) and statins. Muench et al. found no differences in good medication adherence for anti-diabetics or RASA among NP and MD PCP provider type. Across all three medications, beneficiaries seeing NPs experienced lower office-based and specialty care costs and ER visits.

The purpose of the study was to compare outcomes of primary care delivered by NPs and physicians for patients receiving follow-up care after visiting the ED or urgent care. Adults were recruited from an urgent care and two EDs that were part of the Columbia Presbyterian Medical Center system. Patients were randomly assigned to either an NP or physician clinic for care between August 1995 and October 1997. Data was collected from telephone and in-person interviews and health services utilization data. Patient satisfaction, health status, physiological tests and health service utilization had no significant differences between the two provider groups at six months. NPs' patients with hypertension had statistically significant lower diastolic values. Overall, when NPs were in the same setting and held similar authority as physicians, patient outcomes for NPs and physicians were found to be comparable.


The purpose of the study was to evaluate if the quality of diabetes care differs between physician-only practices and practices with APPs and to identify any contributing characteristics related to differences in care. The authors conducted a cross-sectional analysis of baseline data of adult patients treated for Type 1 or Type 2 diabetes in the past year from 46 practices, measuring adherence to American Diabetes Association clinical guidelines. The study addresses that family medicine practices with NPs performed better than physician-only practices and significantly better than practices with PAs regarding quality measures of diabetic care (e.g., monitoring hemoglobin A1C, lipid and microalbumin levels). Practices with NPs were also more likely to have patients attain lipid targets than practices with PAs.


To examine the impact of advanced practice registered nurses (APRNs) on quality measure (QM) scores within the Missouri Quality Initiative (MOQI) intervention, Rantz et al. conducted a two-group comparison analysis, in which a matched group was selected from facilities within the same county as the intervention nursing homes that were similar in QM scores, size and ownership between September 2013 and September 2016. Rantz et al. found that QM scores for the APRN intervention group were better than the comparison group.


This original Centers for Disease Control and Prevention (CDC) research evaluated the rate of health education provided by NPs and certified midwives, PAs and physicians to patients with chronic diseases. A secondary analysis was conducted using a sample of 136,432 adult patient visits (2005–2009) with chronic conditions (asthma, chronic obstructive pulmonary disease [COPD], depression, diabetes, hyperlipidemia, hypertension, ischemic heart disease and obesity) drawn from the National Hospital Ambulatory Medical Care Survey (NHAMCS). The authors found that health education delivery to patients with chronic conditions was higher among NPs and PAs than physicians.


This study evaluates the relationship between patient satisfaction and practitioner type during primary care visits at a managed-care organization. A retrospective observational study of 41,209 patient satisfaction surveys randomly sampled between 1997 and 2000 for visits by pediatric and medicine departments identified higher satisfaction with NP and/or PA interactions than those with physicians, for the overall sample and by specific conditions.
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A sample of 1,598 families were randomly allocated, so that two-thirds continued to receive primary care from a family physician and one-third received care from an NP. Four outcome measurements (i.e., mortality rates and physical, emotional and social function) were applied to patients in the trial to observe clinical effectiveness and safety. Results demonstrated comparable outcomes. Mortality rates had no significant differences between the two study groups. The measurements of physical, emotional and social function in both groups had similar levels after one year of care.

Schuttner, L., Richardson, C., Parikh, T., & Wong, E. S. (2023). "Low-value" glycemic outcomes among older adults with diabetes cared for by primary care nurse practitioners or physicians: A retrospective cohort study. *International Journal of Nursing Studies, 104532.*

Schuttner et al. used a retrospective cohort design to examine diabetes outcomes and glycemic overtreatment for patients at risk of hypoglycemia who were assigned to NPs or physicians. National VHA data between 2010 and 2012 (N=38,543) was used. Patients assigned to NPs were 20% less likely to have hemoglobin A1C less than 7 two years later, compared to patients assigned to physicians. This finding indicates NPs manage high-risk patients with diabetes as well as or better than physicians.


Smith et al. examined diabetic outcomes and cost savings using VHA data from 2012 (N=279,009). Patients of NPs had lower odds of ED use, as compared to patients of physicians. Additionally, NPs had significantly lower inpatient, outpatient and pharmacy costs for patients, resulting in $563 less for patients who saw NPs. NPs provide care that results in patients needing fewer hospital visits and saves patients and hospitals money.


From July 1971 to July 1972, a randomized controlled trial was conducted in two family practices in Burlington to compare the effects of utilizing NPs or physicians to provide primary care services. The purpose of this paper was to detail the study design, logistics, data and summary of results, also described in Sacket et al. (1974). The chosen unit for randomization was families; 1,598 families were eligible for the trial, and two-thirds were assigned to standard care with a family physician. The other third were assigned to care provided by NPs. A household survey was conducted before and after the experimental period to collect health status and medical services utilization. During this one-year period, management of preselected indicator conditions and drug prescriptions were assessed for quality of care.


Tapper et al. examined the effect of care quality and outcomes for adult cirrhosis patients managed by APPs. A retrospective analysis was conducted using Optum, an American commercial claims database, which yielded 389,257 unique patients. Patients of APPs had higher rates of hepatocellular carcinoma (HCC) screening and varices screening, increased use of rifaximin after discharge for hepatic encephalopathy, lower risk of readmission within 30 days and lower risk of death. When working with gastroenterologists/hepatologists, APPs were associated with improved quality of care and patient outcomes.
Use of terms such as mid-level provider and physician extender

Discussion Paper: Quality of Nurse Practitioner Practice


Virani et al. compared the quality of care delivered by APPs and physicians to patients with diabetes and cardiovascular disease (CVD) within a primary care setting. Clinical and administrative data was used to identify diabetes or CVD patients from all 130 VHA facilities who sought care during the 2014 fiscal year (October 2013–September 2014). Quality of care for diabetes and CVD patients delivered in a primary care setting was comparable between APPs and physicians, noting no significant differences.


The purpose of the study was to determine if there were any clinical differences in quality of care given by APPs, as compared to physicians. Performance measures compared for care included: quality of coronary artery disease (CAD), heart failure (HF) and atrial fibrillation (AF) care. Patients enrolled in the registry who had an outpatient cardiology visit in 2012 were included in the study, and two analyses were conducted: 1) comparing patients receiving care from APPs to patients receiving care from physicians in a practice with physicians and APPs, and 2) comparing patients receiving care in practices with physicians and APPs to patients receiving care from physician-only practices. Patient data was extracted from the American College of Cardiology’s PINNACLE (Practice Innovation and Clinical Excellence) registry, and National Provider Identifier (NPI) numbers were used to determine if the treating practitioner was a physician or an APP. Quality measures were comparable among both groups, and smoking cessation screening intervention for CAD patients was higher among the APP group.


To compare the proportion of hypertensive patients with controlled blood pressure (BP) being treated by NPs to the proportion of comparable patients with controlled BP being treated by MD PCPs, Wright et al. conducted a cross-sectional retrospective medical record review at 21 physician-based practices across the U.S. and three independent NP-based practices in northeastern U.S. between December 2007 and November 2009. Wright et al. found comparable controlled BP rates across provider groups.


Yang et al. examined hemoglobin A1C levels over the course of natural diabetes in VHA patients cared for by NPs, PAs and physicians, all of whom practice under a similar scope of practice within this integrated health care system. A retrospective cohort study was comprised of veterans who had been newly diagnosed with diabetes in 2008, experienced the continuation of primary care between 2008 and 2012 and had 75% or greater percentage of primary care visits with one of the three provider types. The authors concluded that patient care administered by NPs and PAs was comparable to that of physicians at diagnosis and during the four-year follow-up period.

Section II. Systematic Reviews and Meta-Analyses


Bakerjian conducted an extensive review of the literature, particularly of NP-led care, and found that long-term care patients managed by NPs were less likely to have avoidable geriatric complications, such as falls, urinary tract infections (UTIs), pressure ulcers, etc. They also had improved functional status, as well as better managed chronic conditions.

A meta-analysis of 38 studies, comparing outcomes for a total of 33 patients of NPs with those of physicians, demonstrated that NP outcomes were equivalent to or greater than those of physicians. NPs’ patients had higher levels of compliance with recommendations in studies where provider assignments were randomized and when other means to control patient risks were used. Patient satisfaction and the resolution of pathological conditions were greatest for NPs. NP and physician outcomes were equivalent on all other outcomes.


This systematic review of 36 articles examines whether the hiring of NPs in emergency rooms can reduce wait time, improve patient satisfaction and result in the delivery of cost-effective, quality care. Results showed that hiring NPs can result in reduced wait times, leading to higher patient satisfaction. NPs were found to be equally as competent as physicians at interpreting X-rays and more competent at following up with patients by phone, conducting physical examinations and issuing appropriate referrals.


As early as 1979, the Congressional Budget Office reviewed findings of the numerous studies of NP performance in a variety of settings and concluded that NPs performed as well as physicians with respect to patient outcomes, proper diagnosis, the management of specified medical conditions and the frequency of patient satisfaction.


Published literature on patient outcomes between NPs and physicians in specialty outpatient settings between 1995 and 2016 was reviewed. Eleven studies based in the United States and internationally were included. Published research consistently demonstrated NPs performed as well as physicians in patient safety, quality of life, treatment complications, symptom management and adverse effects. Furthermore, multiple studies found better mortality rates, disease progression, treatment adherence, treatment success and patient satisfaction in patients treated by NPs, compared to physicians.


Htay and Whitehead evaluated articles from 2000 to 2019 that addressed the role of NPs in health care and how NPs address complex patient care. The review of 13 studies showed strong quality of care by nurse practitioners, including adherence to guidelines, medication costs and requirements, health status, patient satisfaction, time spent in clinics and physical functioning.


A systematic review synthesized 14 papers published between 2006 and 2014 on the impact of emergency nurse practitioners on cost, quality of care, satisfaction and waiting times in EDs. NPs’ quality of care was equal to or higher than that of doctors or medical provider groups. Additionally, patients managed by ED NPs had shorter wait times for care, ranging from 7-28 minutes less across nine studies, compared to patients managed by ED physicians.

Kreeftenberg et al. conducted a systematic review and meta-analysis of all published research until 2018 on nurse practitioners’ impact on critical care settings. Meta-analytic findings of eight studies showed no significant differences in mortality or length of stay in hospitals between patients treated by NPs, compared to those treated by physician residents or fellows in critical care settings.


This meta-analysis included 25 articles, related to 16 studies, comparing outcomes of primary care nurses (nurses, NPs, clinical nurse specialists or other APRNs) and physicians. The quality of care provided by nurses was as high as that of physicians. Overall, health outcomes and outcomes such as resource utilization and cost were equivalent for nurses and physicians. The satisfaction level was higher for nurses. Studies included a range of care delivery models, with nurses providing first contact, ongoing care and urgent care for many of the patient cohorts.


This meta-analysis of studies comparing the quality of primary care services of physicians and NPs demonstrates the role NPs play in reinventing how primary care is delivered. The authors found that comparable outcomes are obtained by both providers, with NPs performing better in terms of time spent consulting with the patient, patient follow-ups and patient satisfaction.


McMenamin et al. reviewed the roles and effects of NPs on primary care patients with chronic conditions and examined cost, quality and utilization. A total of 15 articles met inclusion criteria and were published between 2003-2021. Several articles found either modest improvements in patient outcomes, such as diabetes and blood pressure, or no difference from their previous care plans. Additionally, NPs were associated with improved patient empowerment, confidence and self-management after receiving care from NPs. These findings highlight that NPs provide care that is equal to or no different than past patient care and can enhance patient confidence in self-care management.


The outcomes of NP-delivered care were examined through a systematic review of 37 published studies, most of which compared NPs’ outcomes with those of physicians. Outcomes included measures such as patient satisfaction; patient perceived health status; functional status; hospitalizations; ED visits; and biomarkers such as blood glucose, serum lipids and blood pressure. Newhouse et al. concluded that NPs’ patient outcomes are comparable to those of physicians.


The Office of Technology Assessment reviewed studies comparing NP and physician practice, concluding that “NPs appear to have better communication, counseling and interviewing skills than physicians have.” The authors found malpractice premiums and rates supported patient satisfaction with NP-delivered care, and they pointed out that successful malpractice rates against NPs remained extremely rare.
The authors reviewed 26 studies comparing care provided by NPs and physicians, concluding that NPs scored higher in many areas. These included: amount/depth of discussion regarding child health care, preventive health and wellness; amount of advice, therapeutic listening and support offered to patients; completeness of history and follow up on history findings; completeness of physical examination and interviewing skills; and patient knowledge of the management plan given to them by the provider.

The full Summer 1992 issue of this journal was devoted to the topic of advanced practice nursing, including documenting the cost-effective and high-quality care provided, and calling for the elimination of regulatory restrictions on their care. Safriet summarized the U.S. Office of Technology Administration study, concluding that NP-delivered care was equivalent to that of physicians. Safriet pointed out that 12 of the 14 studies reviewed in this report, which showed differences in quality, found higher quality for NP-delivered care. Reviewing a range of data on NP productivity, patient satisfaction and prescribing, Safriet concluded, “APNs are proven providers, and removing the many barriers to their practice will only increase their ability to respond to the pressing need for basic health care in our country.”

Smigorowsky et al. conducted a systematic review and meta-analysis to evaluate literature published between 2007 and 2017 on the effectiveness of NP-led cardiovascular care. Meta analytic results of five studies showed no differences between readmission for heart failure, length of stay and health-related quality of life were found between NP-led care and previous care.

Evidence regarding the impact of NPs compared to MDs on health care quality, safety and effectiveness was systematically reviewed. Data from 37 of 27,993 articles published from 1990 to 2009 was summarized into 11 aggregated outcomes. Outcomes for NPs, as compared to MDs, are comparable or better for all 11 outcomes reviewed. A high level of evidence indicated better serum lipid levels in patients cared for by NPs in primary care settings. A high level of evidence also indicated that patient outcomes on satisfaction with care, health status, functional status, the number of ED visits and hospitalizations, blood glucose, blood pressure and mortality are similar for NPs and MDs.

Swan et al. conducted a systematic review of all randomized control trials on the safety and effectiveness of primary care by NPs. Ten articles were found to meet their inclusion criteria. Two articles showed patients seen by NPs had better cholesterol and diastolic blood pressure. Four studies found higher patient satisfaction among NPs, two found lower cost of care, and three showed lower consultation times by NPs compared to that of physicians and fewer primary care visits two years after an initial consultation.

Fifteen articles were reviewed on the impact of advanced practice nursing on the quality of care, clinical outcomes, patient satisfaction and cost in emergency and critical care settings between 2006 and 2016. Among NPs, the review found they provided equal or better quality of care in time to consultation, treatment, patient satisfaction and length of stay, as compared to usual service models. Additionally, NPs had equal patient mortality compared to that of physicians.

This study examined the effects of state NP practice regulations on health care delivery through a systematic review of published studies between 2000 and 2019. Across 33 studies, Full Practice Authority (FPA) was associated with an increase in NP supply in health professional shortage areas and community health centers. States with FPA had higher odds of NPs practicing in rural areas and in primary care, as well as increased visits to primary care offices, mammograms and education in community health centers. Lower rates of ED use were also associated with FPA. Finally, states with FPA either had no differences or better quality of care or health outcomes, as compared to states without FPA.