AMA issue brief: Summary of studies on scope of practice

Cost and Quality of Care

Expanding the scope of practice of nurse practitioners and physician assistants may actually increase the cost of care due to inappropriate prescribing, unnecessary referrals to specialists, unnecessary orders for diagnostic imaging studies such as x-rays, and more biopsies performed compared to physicians. Below is a brief summary of these findings.

"The Productivity of Professions: Evidence from the Emergency Department," David C. Chan, Jr. and Yiqun Chen, National Bureau of Economic Research, Nov. 2022, updated July 2024

This study by leading economists compares the productivity of nurse practitioners (NPs) practicing without any physician involvement to the productivity of physicians. Using three years of Veteran's Health Administration data on emergency department (ED) visits, the study finds that NPs use more resources and achieve worse outcomes than physicians, especially when dealing with complex patients. This increased use of resources by NPs resulted in 7 percent higher cost of ED care or $66 per patient and an 11 percent longer length of stay compared to physicians. The authors note that "[c]ompared to physicians NPs are likelier to obtain external information from radiology tests and formal consults. NPs also exhibit prescription patterns consistent with responses to lower skill." Despite using more resources and keeping the patient in the ED longer than patients seen by a physician, this study finds that patients seen by an NP had worse outcomes – measured by a 20 percent increase in 30-day preventable hospitalizations.

In comparing the productivity of physicians to NPs, the authors find that "NPs exhibit lower productivity than physicians" since "NPs on average use more inputs (longer lengths of stay and higher costs) and achieve less favorable patient outcomes." The authors also find that NPs are more costly to employ than physicians. For example, they determined that allocating one quarter of VHA ED patients to NPs would increase non-wage spending by $197 million per year, or a net cost of $129 million if accounting for lower NP wages. Moreover, the authors find that increasing the number of NPs in an ED to decrease ED wait times by 30 minutes, would actually result in a 10 minute longer length of stay and increase total medical spending by $480 per case.

Of note, this study is among the upper echelon of studies in this field, employing a high-quality causal analysis, rather than correlative analysis which is more common in this body of literature. The study also leverages data from the VHA during a time when NPs were actually practicing without any physician involvement, giving a true assessment of the impact of NPs practicing without any physician involvement on the cost and quality of patient care.

"Association of State Share of Nonphysician Practitioners with Diagnostic Imaging Ordering Among Emergency Department Visits for Medicare Beneficiaries," *JAMA Network Open*, Nov. 2022

The authors used Medicare data from 2005-2020 to determine how imaging ordering patterns differed based on the share of emergency department (ED) visits by a physician or non-physician practitioner (NPP), which included nurse practitioners and physician assistants. Looking at imaging claims ordered by the evaluation and management (E&M) clinician and accounting for the increased number of NPPs providing care as the E&M clinician in EDs across the country, the authors conducted a cross-sectional analysis of more than 16 million imaging claims and found that "NPPs are associated with an increased likelihood of an ED visit involving imaging, and for ED visits with imaging, a greater number of imaging studies were performed per visit." Compared with no NPPs, the presence of NPPs in the

ED was associated with 5.3% more imaging studies per ED visit, including CT, radiography, fluoroscopy, MRI, ultrasound, etc. The authors note their findings are consistent with other studies that found increased imaging by NPPs in the outpatient setting and the ED.

"Targeting Value-Based Care with Physician-Led Care Teams," Bryan N. Batson, MD, Samuel N. Crosby, MD, and John Fitzpatrick, MD, *Journal of the Mississippi State Medical Association*, Jan. 2022

Based on a robust analysis of data, Hattiesburg Clinic, a multispecialty clinic in Hattiesburg, Mississippi, found that care provided by nonphysicians working on their own patient panels led to higher costs, more referrals, higher emergency department use, and lower patient satisfaction than care provided by physicians. Hattiesburg Clinic is a leading ACO, ranking first in quality in is cohort in 2016 and 2017. The clinic had allowed non-physicians including nurse practitioners and physician assistants to have their own primary care panel of patients. The patients in these panels were less complex than those seen by physicians and the non-physicians had access to a collaborating physician.

After compiling and reviewing data on over 300 physicians, 150 non-physicians, 208,000 patient surveys, and cost data on over 3,300 unique Medicare beneficiaries, Hattiesburg Clinic found that care provided by non-physicians resulted in higher costs. Data also found non-physicians had higher rates of utilization including visits to the emergency department and referrals to specialists. Moreover, data showed that physicians performed better in 9 out of 10 quality metrics and received higher patient satisfaction scores.

The cost data was compelling. Based on Medicare cost data, the clinic found Medicare ACO patients spend was nearly $43 higher per member per month for patients with a non-physician as their primary care provider compared to those with a physician. These additional costs could translate to an additional $10.3 million in spending annually. Adjusting for patient complexity, this number jumped to over $119 per member per month or $28.5 million more annually. The authors opined, "We believe very strongly that APPs are a crucial part of the care team; however, based on a wealth of information and experiences with them functioning in collaborative relationships with physicians, we believe very strongly that nurse practitioners and physician assistants should not function independently."

"Brief Report: Outpatient Antibiotic Prescribing Among United States Nurse Practitioners and Physician Assistants," *Open Forum Infectious Diseases*

The study found that ambulatory visits involving nurse practitioners and physician assistants more frequently resulted in an antibiotic prescription compared with physician visits.

"Patient, Provider and Practice Characteristics Associated with Inappropriate Antimicrobial Prescribing in Ambulatory Practices," *Infection Control & Hospital Epidemiology*

The study found that adult patients seen by APPs were 15 percent more likely to receive an antibiotic than those seen by a physician. The rate of prescribing for pediatric patients was similar.

"Comparison of the Quality of Patient Referrals from Physicians, Physician Assistants, and Nurse Practitioners," *Mayo Clinic Proceedings*

A 2013 study by the Mayo Clinic found inappropriate referrals to tertiary referral centers by nurse practitioners and physician assistants could offset any potential savings from the increased use of nurse practitioners and physician assistants. The study compared the quality of physician referrals for patients with complex medical problems against referrals from nurse practitioners and physician assistants for patients with the same problems. Blinded to the source of the referrals, a panel of five experienced physicians used a seven-instrument assessment to determine the quality of each referral. Physician referrals received "significantly higher" scores in six of the seven assessment

areas. Physician referrals were also more likely to be evaluated as necessary compared to nurse practitioner and physician assistant referrals which were more likely to be evaluated as having little clinical value.

"A Comparison of Diagnostic Imaging Ordering Patterns Between Advanced Practice Clinicians and Primary Care Physicians Following Office-Based Evaluation and Management Visits," ***JAMA Internal Medicine***

The authors of this study found that nurse practitioners and physician assistants were associated with more ordered diagnostic imaging than primary care physicians following an outpatient visit. The authors noted, the findings suggest that expanding the authority and use of nurse practitioners may alleviate physician shortage, but the increased imaging may have ramifications on care and overall costs.

"National Trends in the Utilization of Skeletal Radiography," ***Journal of the American College of Radiology***

This study found skeletal x-ray ordering increased substantially—by 441 percent—among non-physician providers, primarily nurse practitioners and physician assistants.

"Biopsy Use in Skin Cancer Diagnosis: Comparing Dermatology Physicians and Advanced Practice Professionals," ***JAMA Dermatology***

This study compared the number needed to biopsy (NNB) per malignant neoplasm between dermatology physicians and advanced practice professionals (APPs). The dermatologists and APPs in the study practiced in the same institution. APPs treated new and established patients, most of whom were not evaluated by a physician; however, a physician was available in the clinic. The authors found the NNB of any skin cancer for APPs was double that of physicians, and that difference was most pronounced in younger patients and those without a history of skin cancer.

"Accuracy of Skin Cancer Diagnosis by Physician Assistants Compared with Dermatologists in a Large Health Care System." ***JAMA Dermatology***

This study compared the accuracy of dermatologists with physician assistants in diagnosing skin cancer, finding physician assistants performed more skin biopsies per case of skin cancer diagnosed and diagnosed fewer melanomas in situ, suggesting that the diagnostic accuracy of PAs may be lower than that of dermatologists. The study found, "compared with dermatologists, physician assistants have lower diagnostic accuracy for melanoma." Authors from the study opined that although the availability of PAs may help increase access to care and reduce waiting times for appointments, these findings have important implications for the training, appropriate scope of practice, and supervision of PAs and other nonphysician practitioners in dermatology.

"Opioid Prescribing by Primary Care Providers: a Cross-Sectional Analysis of Nurse Practitioner, Physician Assistant, and Physician Prescribing Patterns," ***Journal of General Internal Medicine***

Using 2015 Medicare claims data, the authors conducted a retrospective cross-sectional analysis to determine the opioid prescribing patterns of physicians, nurse practitioners and physician assistants who worked in primary care and prescribed at least 50 prescriptions. Based on their analysis, the authors found a greater number of NPs (8.0%) and PAs (9.8%) overprescribed opioids compared to physicians (3.8%). They also found NPs/PAs in states with independent prescription authority for schedule II opioids were 20 times more likely to overprescribe opioids than NPs/PAs in states with restricted prescription authority. Of note, the study also found from 2013 to 2017, when almost every medical specialty decreased opioid prescribing, NPs/PAs significantly increased opioid prescribing. The authors opined on potential solutions for reducing NP/PA prescribing, such as implementing mandatory continuing education in safe opioid prescribing and restricting NPs/PAs prescribing authority. Based on their analysis, they also found 6.3 percent of nurse practitioners and 8.4 percent of physician assistants prescribed opioids to more than 50 percent of their patients compared to just 1.3 percent of physicians.

Education and Training

"Types, Frequency, and Depth of Direct Patient Care Experiences of Family Nurse Practitioner Students in the United States" ***Journal of Nursing Regulation*****, April 2021**

This study examined the number of patient care experiences family nurse practitioner (FNP) students complete as part of their education and training using results from a cross-sectional, observational, complex samples survey. A total of 3,946 FNP students geographically distributed and representative of NP programs in the United States completed the survey. The survey instrument included 84 specific tasks FNP students are expected to complete as part of their clinical training across four domains of assessment, diagnosis, treatment, and evaluation of adult, geriatric, and pediatric patients. This included basic tasks such as performing a comprehensive physical exam, obtaining a comprehensive health history, assessing a patient for pain, and performing a mental health assessment. The survey asked FNP students how many times during their training specific tasks were performed across each population foci, including "never," "1-2 times," "3-6 times," "7-10 times," and ">10 times." **A large number of students reported never experiencing some clinical tasks during their training, including mental health assessment, ordering diagnostic tests, performing primary care procedures (e.g. wart removal, suturing, cerumen removal), and evaluating treatment and educational outcomes related to chronic pain.** This was even more prevalent among the pediatric population, with "a large number of students reporting never on all eight clinical tasks in the evaluation task area" for the pediatric population.

In many instances just over half the students surveyed said they completed these clinical tasks more than 10 times. For example,

- **Obtaining a comprehensive health history:** 64.9% of FNP students surveyed said they obtained a comprehensive health history on an adult patient more than 10 times with 31.4% stating they only completed this task 7-10 times during their clinical training.
- **Performing a comprehensive physical examination:** 69.4% of FNP students surveyed said they performed a comprehensive physical examination on an adult patient more than 10 times, with 10.6% stating they completed this task only 1-2 times during their clinical training.
- **Prescribing medications:** 61.5% of FNP students said they prescribed medications to an adult patient more than 10 times, with 15% stating they only prescribed medications to an adult patient 1-2 times. Only 44.6% and 56.3% of FNP students surveyed said they prescribed medications more than 10 times to a pediatric patient and geriatric patient respectively, with 5.5% and 4.0% of FNP students indicating they never prescribed medications to pediatric or geriatric patients respectively during their clinical training.
- **Ordering diagnostic tests:** Only 64.1% of FNP students surveyed indicated they ordered diagnostic tests more than 10 times for adult patients, with 25.6% indicating they only ordered diagnostic tests 3-6 times for adult patients during their clinical training. For geriatric patients, 57.2% of FNP students said they ordered diagnostic tests more than 10 times and 26.5% indicated they only ordered diagnostic tests for geriatric patients 3-6 times during their training. For pediatric patients, the numbers are even lower with 37.5% of FNPs stating they ordered diagnostic tests for pediatric patients more than 10 times and 26.3% and 23.9% indicating they ordered diagnostic tests for pediatric patients 3-6 times or 7-10 times respectively.
- **Developing differential diagnoses:** Only 60.8 % of FNPs surveyed said they developed differential diagnoses for geriatric patients during their clinical training with 27.4% indicating they completed this task only 7-10 times. Similarly, 67.5% and 16.2% of FNPs indicated they developed differential diagnoses for pediatric patients greater than 10 times and 7-10 times respectively. For adult patients, the numbers were slightly higher with 78.8% of FNP students surveyed indicating they developed differential diagnoses for adult patients more than 10 times and 14.4% indicating they performed this task only 3-6 times during their clinical training.

The authors concluded, "For many students, clinical experiences in their FNP program did not provide patient encounters reflecting the tasks deemed essential as outlined in the ANCC FNP Role Delineation Study and used in the development of the national certification examination (American Association of Colleges of Nursing, 2012)." The

authors also note that their findings align with other studies of new NPs that "reported uncertainty in their role, including self-doubt and feeling minimally prepared in caring for patients with complex problems, including mental health issues and geriatric health, and in providing certain procedures. (Dumphy et. al., 2019; Faraz, 2016, 2019, Hart and Bowen, 2016)."

Note: It is useful to compare the findings from this study and the frequency data points used in the survey instrument to standards for family medicine residency programs. The survey instrument ranged from "never" to "greater than 10 times" that a NP performed each task during their clinical training, which is a fraction of the minimum in-person patient encounters required of family medicine resident physicians. The Accreditation Council for Graduate Medical Education (ACGME) family medicine residency standards require resident physicians to complete a minimum number of hours and in-person patient encounters across patient populations and settings: family medicine residents must complete a minimum of 1,650 in-person patient encounters at the family medicine program site, 600 hours (or six months) and 750 patient encounters dedicated to the care of hospitalized adult patients, 200 hours and 250 patient encounters dedicated to pediatric patients in the hospital or emergency care setting, 200 hours or 250 patient encounters caring for children and adolescents in an ambulatory setting, and 100 hours or 125 patient encounters dedicated to caring for older patients. (ACGME Program Requirements for Graduate Medical Education in Family Medicine, July 1, 2020)

"Alignment of Nurse Practitioner Educational Preparation and Scope of Practice in United States Emergency Departments: A Systematic Review of the Literature" ***Journal of Emergency Nursing,*** **July 2021**

A systemic review of existing literature in which the authors concluded they were "unable to find evidence that supports the alignment of nurse practitioner educational preparation and training with scope of clinical practice in United States emergency departments." The authors noted that according to the American Academy of Nurse Practitioners about 15,000 NPs practice in emergency departments (EDs), but NPs "have variable levels of clinical experience, education, and training." Typically NPs were added to ED staff to care for nonurgent patients, however, according to Medicare provider use and payment data, NPs are increasingly providing care for all levels of severity in an emergency department, independent of physicians. This is problematic because most NPs are trained to provide nonurgent care, with more than 60% of the NP workforce certified as family NPs. In addition, unlike physicians who have clear requirements for emergency medicine residency programs, "NPs do not have a standardized curriculum. Some academic programs are online with limited hands-on clinical training" and "NPs can graduate without any EM experience." Even the limited number of NPs who pursue fellowship training in emergency care, have varied experiences.

"Radiologic Imaging Content in Family Nurse Practitioner Programs: A Needs Assessment" ***The Journal for Nurse Practitioners*****, Feb. 2018**

The authors surveyed over 1,000 family nurse practitioners practicing in Texas to assess the amount and nature of radiologic content received in the FNP curriculum. Over 71% of respondents reported that their FNP program contained inadequate content concerning radiology, and 91% indicated that more imaging content would have been useful to them in their current practice. While 2.4% reported receiving "a few weeks" of radiologic content during their training**, over 95% of respondents reported receiving only 1 to 2 days or less of radiologic content throughout their entire FNP program**. Specifically, 32.6% reported 1 to 2 days, 40% reported less than 10 hours, and 25% reported no radiologic content at all.

Respondents commented on the nature of the radiologic training. Those who responded receiving a few weeks of content (2.4%) spent time with board certified radiologists covering content in basic skeletal films, chest radiographs, and other diagnostic imaging modalities. Those responding 1-2 days (32.6%) commented that content included basic chest and skeletal films and online modules. Those responding less than 10 hours (40%) commented that content included "You Tube," "online modules," and "instructions to study other university online modules." Among the 25% who did not receive any radiologic content, comments included "left to preceptors."

Further, 75% of respondents indicated they were either not confident or only somewhat confident in their ability to interpret basic skeletal radiographs. 78% were “not confident,” only “somewhat confident,” or “unsure” of their ability to interpret a basic chest radiograph. Only 26% of respondents indicated familiarity with American College of Radiology Appropriateness Criteria and, of those who were familiar, only 22% reported referring to such guidelines when ordering imaging studies. Despite all this, 61% of respondents reported practicing in an area with expectations for ordering and interpreting radiographic films on a regular basis.

Workforce Studies

Vermont Secretary of State, Office of Professional Regulation, Study of Optometric Advanced Procedures, Jan. 2020.

In response to proposed statewide scope expansions for optometrists, the Vermont Office of Professional Regulation (OPR) conducted a study to evaluate education and training for optometrists, patient need for access to additional practitioners, patient access to care, effects and patient safety, and costs to the health care system. OPR could not conclude that optometrists are properly trained in or can safely perform proposed advanced procedures. They also found that there is little need for, and minimal cost savings associated with, expanding the optometric scope of practice to include advanced procedures, and that scope expansions would not improve access to care as ophthalmologists and optometrists tend to practice in the same areas of the state.

New York State Nurse Practitioners, Martiniano R, Wang S, Moore J. A Profile of New York State Nurse Practitioners, 2017. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany; Oct. 2017.

This study is based on information from NPs active in New York in 2015-2016. Among the study’s findings is that newly graduated nurse practitioners are more likely to enter specialty or subspecialty care rather than primary care, compared to NPs who graduated before 2010.

Centers for Medicare and Medicaid Services, The Graduate Nurse Education Demonstration Project: Final Evaluation Report, Centers for Medicare and Medicaid Services, Aug. 2019.

The Graduate Nurse Demonstration Project was mandated as part of the Affordable Care Act of 2010 and involved Centers for Medicare & Medicaid Services (CMS) providing payments to five eligible hospitals, each of which partnered with schools of nursing, community-based care settings, and other hospitals to expand clinical education for additional APRN students. The project aimed to test whether funding clinical APRN education would increase the number of APRN graduates, and it tracked the employment choices of APRNs following graduation. A study of alumni from this program found that only 25% of alumni served medically underserved communities, and the vast majority were in urban settings. Only 9% went on to work in rural areas and only 2% worked in FQHCs.