California Health Care Foundation

Healthforce Center at UCSF

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Fact Sheet

EXPANDING THE ROLE OF NURSE PRACTITIONERS IN CALIFORNIA

The Impact on Quality of Care

Twenty-eight states and the District of Columbia grant nurse practitioners full practice authority, allowing them to practice and prescribe without formal physician supervision. California requires that nurse practitioners (NPs) have a written collaboration agreement with a physician and is the only western state to have a requirement for physician oversight. Opponents of full practice authority for NPs often express concerns about protecting the quality of patient care as a reason.

Analyses of the peer-reviewed research have concluded that NPs provide care of comparable quality as physicians, even when NPs practice without physician oversight.[1] The high quality of NP care is proven both in studies that looked at primary care in general and in studies that looked at specific components of care such as prescribing, chronic disease management, and ordering diagnostic tests. Researchers who have examined long-term care settings, rural settings, and community health centers have reached similar findings.

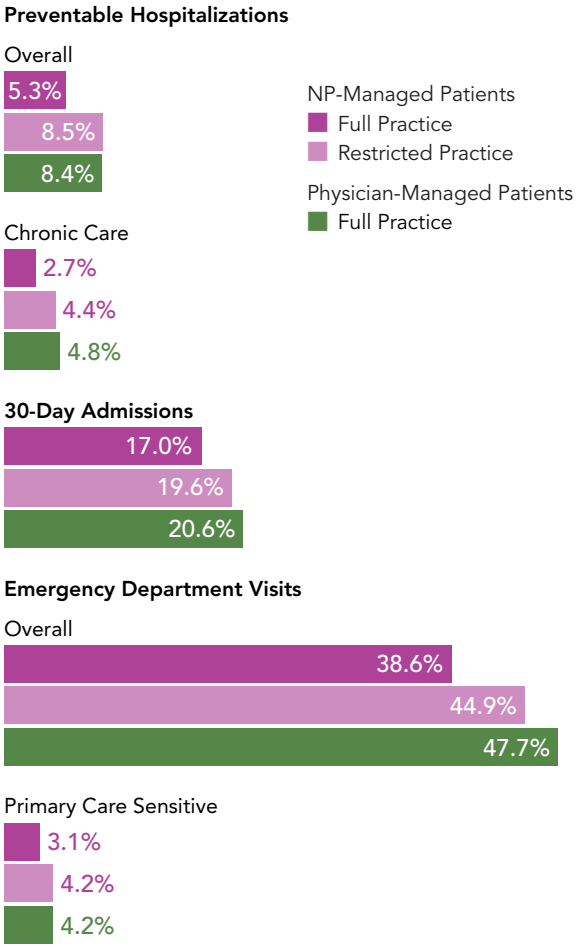
A systematic review examined 11 specific quality and patient outcomes measures for NPs, and concluded that outcomes for NPs were comparable to or better than those achieved by physicians for all outcomes reviewed.[2]

- There was strong evidence that patients achieved lower serum lipid levels when cared for by NPs as compared to physicians in primary care settings.
- There were comparable outcomes between NPs and physicians in satisfaction with care, health status, functional status, number of emergency department visits and hospitalizations, blood glucose, blood pressure, and mortality.

Patients managed by nurse practitioners have lower rates of preventable hospitalizations, readmissions, and emergency department visits than patients managed by physicians.[3] These rates are even lower when NPs have full practice authority.[4] See Figure 1, page 2.

NPs practicing in community health centers[5] provide similar quality of care as physicians, even when they have full practice authority. A study using national data from community health centers found no differences in NP care compared with primary care physicians for eight of nine outcomes:

Figure 1. Rates of Preventable Hospitalizations, 30-Day Readmissions, and ED Visits, Medicare Enrollees, by Scope of Practice



Note: *ED* is emergency department.

Source: Jennifer Perloff et al., "Association of State-Level Restrictions in Nurse Practitioner Scope of Practice with the Quality of Primary Care Provided to Medicare Beneficiaries," *Medical Care Research & Review* 18 (Sept. 1, 2017), doi:10.1177/1077558717732402.

smoking cessation counseling, depression treatment, statin treatment for hyperlipidemia, provision of physical examination, number of health education services, imaging services, number of medications, return visit scheduled, and referral made to a physician. Patients who visited NPs were more likely to receive recommended smoking cessation counseling and more health education/counseling services than those who visited physicians.[6] Another analysis of the same data determined that NPs provided similar quality of care as physicians regardless of whether NPs had full practice authority.[7]

NPs provide similar quality of care as physicians for chronic conditions. A study of care for Medicare patients with chronic obstructive pulmonary disorder (COPD) found that, compared to patients cared for by physicians, patients cared for by a NP/PA (physician assistant) were more likely to receive a short-acting bronchodilator, oxygen therapy, and been referred to a pulmonologist. Patients cared for by NP/PAs were less likely to visit an emergency department for COPD compared to patients cared for by physicians. There were no differences in hospitalization or readmission for COPD between MDs and NPs/PAs.[8]

A study of care for patients with diabetes and cardiovascular disease in Department of Veterans Affairs facilities reported that care quality was comparable between physicians and APPs (advanced practice providers), with clinically insignificant differences.[9]

An analysis of Medicare patients with diabetes found that rates of preventable hospitalizations were lower for patients cared for by NPs than for those cared for by physicians.[10]

Studies of prescribing produce mixed results about whether there are differences between NPs and physicians. Studies are challenged because NPs are more likely to see patients with acute problems while physicians are more likely to see patients with chronic problems or for postsurgical follow-up care.[11] In addition, many studies do not separate NPs from physician assistants (PAs), who have different education and often have different roles in the health care practices.

Recent studies find little difference between NPs and physicians in the frequency of patients receiving prescriptions. The most rigorous study rated prescribing patterns compared with national guidelines and found no difference for 12 of 13 measures. See "General prescribing patterns"(Table 1, page 3).

Studies of antibiotic prescribing are inconclusive because nearly all combine nurse practitioners and physician assistants. Several studies have reported that NPs and PAs are more likely to prescribe antibiotics than physicians, but nearly all these studies combined NPs and PAs, so it is not known what differences exist between NPs and PAs in antibiotic prescribing. See "Antibiotic prescribing" (Table 1).

Studies find no difference in NP ordering of expensive imaging tests compared with physicians. See "Ordering of imaging tests" (Table 1, page 4).

Compared to physicians, NPs are not more likely to refer patients to specialists. See "Specialist referrals" (Table 1, page 5).

Table 1. Quality-of-Care Research Findings

General prescribing patterns	LIMITATIONS	SOURCE
➤ The quality of prescribing by NPs was not statistically different from physician prescribing for 12 of 13 prescribing quality indicators. NPs were less likely to meet standards for corticosteroid use for asthma in children.	➤ Quality indicators developed from national guidelines.	Shiyin Jiao et al., "Quality of Prescribing by Physicians, Nurse Practitioners, and Physician Assistants in the United States," *Pharmacotherapy* 38, no. 4 (April 2018): 417–27, doi:10.1002/phar.2095.
➤ There were no statistically significant differences in rates of prescribing overall between NPs and physicians, or for prescribing of statins for hyperlipidemia.	➤ Sample was only community health centers.	E. T. Kurtzman and B. S. Barnow, "A Comparison of Nurse Practitioners, Physician Assistants, and Primary Care Physicians' Patterns of Practice and Quality of Care in Health Centers," *Medical Care* 55, no. 6 (June 2017): 615–22, doi:10.1097/MLR.0000000000000689
➤ NPs/PAs were less likely than physicians to order a narcotic analgesic for neck or back pain visits, and more likely to order a nonnarcotic analgesic or muscle relaxant.	➤ One integrated health system. Study did not separate NPs from PAs.	Douglas W. Roblin et al., "Provider Type and Management of Common Visit in Primary Care," *Amer. Journal of Managed Care* 23, no. 4 (2017): 225–31, www.ajmc.com.
➤ NPs and PAs were each slower to adopt new pharmaceuticals for new chronic disease patients, resulting in lower costs.	➤ Authors could not determine if result was due to NPs and PAs being more focused on evidence-based practice, receiving less intense marketing from drug companies, or being more attentive to costs.	Z. A. Marcum et al., "New Chronic Disease Medication Prescribing by Nurse Practitioners, Physician Assistants, and Primary Care Physicians: A Cohort Study," *BMC Health Services Research* 16 (2016): 312, doi:10.1186/s12913-016-1569-1.
➤ Statewide rates of prescribing of opioid and benzodiazepine medications are not different between states with restricted practice versus full practice authority for NPs.	➤ Analysis is not at the patient level.	Lori Schirle and Brian E. McCabe, "State Variation in Opioid and Benzodiazepine Prescriptions Between Independent and Nonindependent Advanced Practice Registered Nurse Prescribing States," *Nursing Outlook* 64, no. 1 (Jan.–Feb. 2016): 86–93, doi:10.1016/j.outlook.2015.10.003.
➤ NPs more often prescribed a medication and less often prescribed a controlled substance.	➤ Analysis did not control for diagnoses or patient characteristics.	Daisha J. Cipher, Roderick S. Hooker, and Patricia Guerra, "Prescribing Trends by Nurse Practitioners and Physician Assistants in the United States," *Journal of the Amer. Academy of Nurse Practitioners* 18, no. 6 (June 2006): 291–96, doi:10.1111/j.1745-7599.2006.00133.x.
Antibiotic prescribing		
➤ NP/PA visits were more likely to have an antibiotic prescribed than physician visits.	➤ Study did not separate NPs from PAs.	Guillermo V. Sanchez et al., "Outpatient Antibiotic Prescribing Among United States Nurse Practitioners and Physician Assistants," *Open Forum Infectious Diseases* 3, no. 3 (Summer 2018): ofw168, doi:10.1093/ofid/ofw168.
➤ Adult patients seen by an NP/PA were 15% more likely to receive an antimicrobial. There was no difference for pediatric patients.	➤ Study did not separate NPs from PAs. One health system.	Monica L. Schmidt, Melanie D. Spencer, and Lisa E. Davidson, "Patient, Provider, and Practice Characteristics Associated with Inappropriate Antimicrobial Prescribing in Ambulatory Practices," *Infection Control & Hospital Epidemiology* 39, no. 3 (March 2018): 307–15, doi:10.1017/ice.2017.263.

Table 1. Quality-of-Care Research Findings, *continued*

Antibiotic prescribing, *continued*	LIMITATIONS	SOURCE
➤ NPs/PAs were more likely than physicians to order an antibiotic for acute respiratory infection visits but less likely to order a broad-spectrum antibiotic.	➤ Study did not separate NPs from PAs. One integrated health system.	Roblin et al., "Provider Type."
➤ There was no significant difference in ordering of antibiotics between office-based NPs/PAs and physicians. Among those in hospital settings, NPs/PAs ordered more antibiotics than physicians.	➤ Study did not separate NPs from PAs.	John N. Mafi et al., "Comparing Use of Low-Value Health Care Services Among U.S. Advanced Practice Clinicians and Physicians," *Annals of Internal Medicine* 165, no. 4 (2016): 237–44, doi:10.7326/M15-2152.
➤ NPs had higher rates of antibiotic prescribing compared to physicians for pediatric patients for upper respiratory tract infections.	➤ Authors could not determine if greater prescribing was an indicator of good or bad care.	Elisabeth H. Ference et al., "Antibiotic Prescribing by Physicians Versus Nurse Practitioners for Pediatric Upper Respiratory Infections," *Annals of Otology, Rhinology & Laryngology* 125, no. 12 (2016): 982–91, doi:10.1177/0003489416668193.
➤ NPs/PAs were more likely to prescribe antibiotics than physicians.	➤ Study did not separate NPs from PAs.	Christianne L. Roumie et al., "Differences in Antibiotic Prescribing Among Physicians, Residents, and Nonphysician Clinicians," *Amer. Journal of Medicine* 118, no. 6 (June 2005): 641–48, doi:10.1016/j.amjmed.2005.02.013.
Ordering of imaging tests		
➤ NP-managed patients had lower rates of MRI for low back pain than physician-managed patients.	➤ Study attributed patients to NPs or physicians based on the share of visits to each type of provider.	P. Buerhaus et al., "Quality of Primary Care Provided to Medicare Beneficiaries by Nurse Practitioners and Physicians," *Medical Care* 56, no. 6 (June 2018): 484–90, doi:10.1097/MLR.0000000000000908.
➤ NP-managed patients had lower rates of MRI for low back pain when NPs had full practice authority.	➤ Study attributed patients to NPs or physicians based on the share of visits to each type of provider.	Jennifer Perloff et al., "Association of State-Level Restrictions in Nurse Practitioner Scope of Practice with the Quality of Primary Care Provided to *Medicare Beneficiaries," Medical Care Research & Review* 18 (Sept. 1, 2017), doi:10.1177/1077558717732402.
➤ There were no statistically significant differences in rates of imaging between NPs and physicians.	➤ Sample was only community health centers.	E. T. Kurtzman and B. S. Barnow, "A Comparison of Nurse Practitioners, Physician Assistants, and Primary Care Physicians' Patterns of Practice and Quality of Care in Health Centers," *Medical Care* 55, no. 6 (June 2017): 615–22, doi:10.1097/MLR.0000000000000689.
➤ NPs/PAs were less likely than physicians to order CT or MRI for neck or back pain visits. NPs/PAs were less likely to order an x-ray for acute respiratory infection.	➤ Study did not separate NPs from PAs. One integrated health system.	Roblin et al., "Provider Type."
➤ There was no significant difference in ordering of radiography or CT/MRI between NPs/PAs and physicians.	➤ Study did not separate NPs from PAs.	Mafi et al., "Comparing Use."

Table 1. Quality-of-Care Research Findings, *continued*

Ordering of imaging tests, *continued*	LIMITATIONS	SOURCE
➤ NPs/PAs ordered more imaging services than primary care physicians.	➤ Study did not separate NPs from PAs. Study did not separate primary care NPs/PAs from specialty care. The difference was only 0.3% for new patients and 0.2% for established patients.	Danny R. Hughes, Miao Jiang, and Richard Duszak, "Comparison of Diagnostic Imaging Ordering Patterns Between Advanced Practice Clinicians and Primary Care Physicians Following Office-Based Evaluation and Management Visits," *JAMA Internal Medicine* 175, no. 1 (2015): 101–7, doi:10.1001/jamainternmed.2014.6349.
➤ NPs were more likely to order tests than physicians.	➤ Small sample with only nine NPs, 35 residents, and 10 physicians. Tests were attributed to provider of record; test may have been ordered by another provider.	Alnoor Hemani et al., "A Comparison of Resource Utilization in Nurse Practitioners and Physicians," *Effective Clinical Practice* 2, no. 6 (Nov./Dec. 1999): 258–65, ecp.acponline.org.
Specialist referrals		
➤ Patients referred by NPs were less likely to require surgery.	➤ Single-facility study.	Gelinne et al., "Differential Patterns of Referral to Neurosurgery: A Comparison of Allopathic Physicians, Osteopathic Physicians, Nurse Practitioners, Physician Assistants, and Chiropractors," *World Neurosurg.*, (2019), doi.org.
➤ There were no statistically significant differences in rates of referrals between NPs and physicians.	➤ Sample was only community health centers.	Kurtzman and Barnow, "Comparison of Nurse Practitioners."
➤ There was no significant difference in referrals to other physicians for office-based NPs/PAs compared with physicians. Hospital-based NPs/PAs were more likely to refer to other physicians.	➤ Study did not separate NPs from PAs.	Mafi et al., "Comparing Use."
➤ Referrals from physicians were higher quality than from NPs/PAs and less likely rated as unnecessary.	➤ Study did not separate NPs from PAs.	Lohr et al., "Comparison of the Quality of Patient Referrals from Physicians, Physician Assistants, and Nurse Practitioners," Mayo Clinic Proceedings, 2013;88(11):1266–1271.
➤ NPs were more likely to order tests and referrals than physicians.	➤ Small sample with only nine NPs, 35 residents, and 10 physicians. Tests were attributed to provider of record; test may have been ordered by another provider.	Hemani et al., "Comparison of Resource Utilization."

ABOUT THIS SERIES

This fact sheet is one of a series that examines the scope of practice of nurse practitioners (NPs) in California. Scope of practice laws establish the legal framework that controls the delivery of medical services.

In February 2019, the **California Future Health Workforce Commission** and released a plan to address the state's shortages of primary care and behavioral health providers. One of the Commission's top recommendations was to maximize the role of nurse practitioners (NPs) and to expand their practice authority. California is one of 22 states — and the only western state — that restricts NPs by requiring them to work with physician oversight.

To see other publications in this series, visit **www.chcf.org/npscope**.

About the Author

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About Healthforce Center at UCSF

Healthforce Center at UCSF prepares health care organizations for success by combining a deep understanding of the issues facing their workforce with the leadership skills to drive progress. They work with foundations, hospitals, delivery systems, organizations, and individuals to ensure more effective health care delivery and to inform health care policy. Their efforts are focused in the core areas of leadership programs and workforce research.

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About the Foundation

The California Health Care Foundation is dedicated to advancing meaningful, measurable improvements in the way the health care delivery system provides care to the people of California, particularly those with low incomes and those whose needs are not well served by the status quo. We work to ensure that people have access to the care they need, when they need it, at a price they can afford.

CHCF informs policymakers and industry leaders, invests in ideas and innovations, and connects with changemakers to create a more responsive, patient-centered health care system.

For more information, visit www.chcf.org.

Endnotes

1. M. Swan et al., "Quality of Primary Care by Advanced Practice Nurses: A Systematic Review," *International Journal for Quality in Health Care* 27, no. 5 (2015): 396–404; and Robin P. Newhouse et al., "Advanced Practice Nurse Outcomes 1990–2008: A Systematic Review," Nursing Economic$ 29, no. 5 (Sept.–Oct. 2011): 230–50, www.ncbi.nlm.nih.gov.
2. Julie Stanik-Hutt et al., "The Quality and Effectiveness of Care Provided by Nurse Practitioners," *Journal for Nurse Practitioners* 9, no. 8 (Sept. 2013): 492–500, doi:10.1016/j.nurpra.2013.07.004.
3. P. Buerhaus et al., "Quality of Primary Care Provided to Medicare Beneficiaries by Nurse Practitioners and Physicians," *Medical Care* 56, no. 6 (June 2018): 484–90, doi:10.1097/MLR.0000000000000908.
4. Jennifer Perloff et al., "Association of State-Level Restrictions in Nurse Practitioner Scope of Practice with the Quality of Primary Care Provided to Medicare Beneficiaries," *Medical Care Research & Review* 18 (Sept. 1, 2017), doi:10.1177/1077558717732402.
5. CHCs include FQHCs, FQHC Look-Alikes, and other health center program grantees.
6. E. T. Kurtzman and B. S. Barnow, "A Comparison of Nurse Practitioners, Physician Assistants, and Primary Care Physicians' Patterns of Practice and Quality of Care in Health Centers," *Medical Care* 55, no. 6 (June 2017): 615–22, doi:10.1097/MLR.0000000000000689.
7. E. T. Kurtzman et al., "Does the Regulatory Environment Affect Nurse Practitioners' Patterns of Practice or Quality of Care in Health Centers?," *Health Services Research* 52, supp. 1 (Feb. 2017): 437–58, doi:10.1111/1475-6773.12643.
8. A. Agarwal et al., "Process and Outcome Measures Among COPD Patients with a Hospitalization Cared For by an Advance Practice Provider or Primary Care Physician," *PLoS One* 11, no. 2 (Feb. 24, 2016): e0148522, doi:10.1371/journal.pone.0148522.
9. Salim S. Virani et al., "Comparative Effectiveness of Outpatient Cardiovascular Disease and Diabetes Care Delivery Between Advanced Practice Providers and Physician Providers in Primary Care: Implications for Care Under the Affordable Care Act," *Amer. Heart Journal* 181 (Nov. 2016): 74–82, doi:10.1016/j.ahj.2016.07.020.
10. Yong-Fang Kuo et al., "Potentially Preventable Hospitalizations in Medicare Patients with Diabetes: A Comparison of Primary Care Provided by Nurse Practitioners Versus Physicians," *Medical Care* 53, no. 9 (2015): 776–83, doi:10.1097/MLR.0000000000000406.
11. Daisha J. Cipher, Roderick S. Hooker, and Patricia Guerra, "Prescribing Trends by Nurse Practitioners and Physician Assistants in the United States," *Journal of the Amer. Academy of Nurse Practitioners* 18, no. 6 (June 2006): 291–96, doi:10.1111/j.1745-7599.2006.00133.x.