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## Employment of Advanced Practice Clinicians in Physician Practices

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### Abstract

Nurse practitioners (NPs) and physician assistants (PAs) are advanced practice clinicians that are increasingly involved in the delivery of health care services. The role of advanced practice clinicians in primary care has been described previously.<sup>1–4</sup> However, less is known about advanced practice clinicians in physician specialty practices.<sup>5</sup> In this study, we characterize levels of and changes in advanced practice clinician employment across different physician practices in the United States in 2008 and 2016, with a particular focus on specialty practices.

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**Author Contributions:** Dr Martsolf had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

*Study concept and design:* Martsolf, Barnes, Richards, McHugh.

*Acquisition, analysis, or interpretation of data:* Barnes, Richards, Ray, Brom, McHugh.

*Drafting of the manuscript:* Martsolf, Barnes, McHugh.

*Critical revision of the manuscript for important intellectual content:* All authors. *Statistical analysis:* Martsolf, Barnes, Richards, Brom.

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*Study supervision:* Martsolf, McHugh.

## Methods

We used the 2008 and 2016 SK&A outpatient provider files for our analyses. The SK&A is a proprietary data set that includes information on 90% of physician practices in the United States. We first categorized specialty practices as single medical or single surgical specialty practices (Table), examining multispecialty practices separately. We also conducted analysis on the 3 largest categories of primary care practices: family medicine, internal medicine, and pediatrics. We performed supplementary analyses for the top 10 specialties by practice counts across all years. For each practice type, we calculated the proportion of practices with an advanced practice clinician (overall and by NPs and PAs) and the percent change between 2008 and 2016. Using STATA statistical software (version 15, STATA Corp) we created choropleth maps to show variation in the state-level proportion of practices that employed advanced practice clinicians in 2016.

## Results

In 2016, approximately 28% of all specialty practices employed advanced practice clinicians. Multispecialty practices were most likely (49%) and surgical specialties least likely (21%) to employ advanced practice clinicians. Among the top 10 specialties, advanced practice clinicians were employed in at least a quarter of practices in the following specialties: cardiology, obstetrics-gynecology, dermatology, gastroenterology, and orthopedic surgery. Specialty practices were more likely to employ NPs than PAs, with the exception of surgical practices, which relied more on PAs. Overall, from 2008 to 2016, there was a 22% increase in specialty practices employing advanced practice clinicians. As a point of comparison, there has been a 24% increase in advanced practice clinician use among primary care practices, such that 35% of these practices have at least 1 advanced practice clinician by 2016. Employment of NPs in specialty practices grew faster compared to PAs (33% vs 20% increase).

In the Figure we show that specialty practice advanced practice clinician employment was greatest in the Mountain West and West North Central regions (eg, North Dakota, South Dakota, Minnesota, and Iowa) during 2016—analogue to primary care. We also note that restricting our analyses to a balanced panel of practices from 2008 to 2016 did not meaningfully change the data patterns we observed.

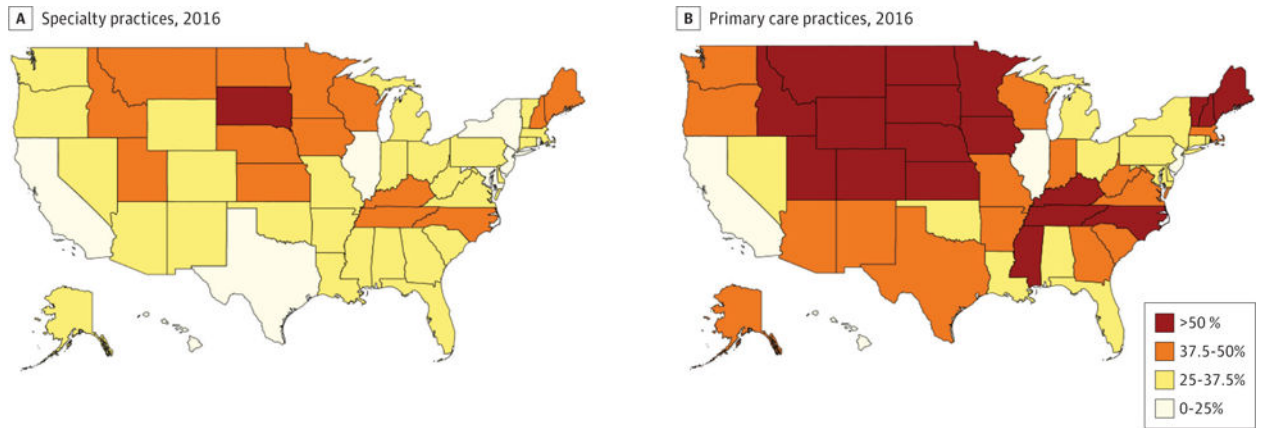
## Conclusions

We found that about 1 in 4 specialty practices employ advanced practice clinicians, compared with 1 in 3 primary care practices. Because the NP role was historically developed to focus on primary care and most advanced practice clinicians are NPs, one would expect that advanced practice clinicians would have a greater presence in primary care practices. The proportion of practices with advanced practice clinicians grew modestly over the past 8 years and the growth was similar across specialty and primary care practices. Overall growth in advanced practice clinicians may be driven by recent increases in graduates from advanced practice clinician programs, the emergence of value-based purchasing models that are incentivizing team-based care, and downward price pressure from public and private

payers—making the lower costs of advanced practice clinician employment more attractive. Advanced practice clinicians may also be increasingly moving into specialty practices as specialist physicians embrace new roles for advanced practice clinicians.<sup>6</sup> These data have important limitations. They only include outpatient providers and they have no information about the specific duties of advanced practice clinicians in the practice. As the presence of advanced practice clinicians in the delivery of specialty care increases, future research will need to understand their contributions to access, quality, and value.

## References

1. DesRoches CM, Clarke S, Perloff J, O'Reilly-Jacob M, Buerhaus P. The quality of primary care provided by nurse practitioners to vulnerable Medicare beneficiaries. *Nurs Outlook*. 2017; 65(6): 679–688. [PubMed: 28803624]
2. Graves JA, Mishra P, Dittus RS, Parikh R, Perloff J, Buerhaus PI. Role of geography and nurse practitioner scope-of-practice in efforts to expand primary care system capacity: health reform and the primary care workforce. *Med Care*. 2016; 54(1):81–89. [PubMed: 26565526]
3. Perloff J, DesRoches CM, Buerhaus P. Comparing the cost of care provided to Medicare beneficiaries assigned to primary care nurse practitioners and physicians. *Health Serv Res*. 2016; 51(4):1407–1423. [PubMed: 26707840]
4. Barnes H, Maier CB, Altares Sarik D, Germack HD, Aiken LH, McHugh MD. Effects of regulation and payment policies on nurse practitioners' clinical practices. *Med Care Res Rev*. 2017; 74(4):431–451. [PubMed: 27178092]
5. Ray KN, Martsolf GR, Mehrotra A, Barnett ML. Trends in visits to specialist physicians involving nurse practitioners and physician assistants, 2001 to 2013. *JAMA Intern Med*. 2017; 177(8):1213–1216. [PubMed: 28586817]
6. Brush JE Jr, Handberg EM, Biga C, et al. 2015 ACC Health policy statement on cardiovascular team-based care and the role of advanced practice providers. *J Am Coll Cardiol*. 2015; 65(19): 2118–2136. [PubMed: 25975476]



**Figure.**  
Percent of Physician Practices With Advanced Practice Clinicians by State

Table

Percent of Physician Practices With Advanced Practice Clinicians and the Percent Change From 2008 to 2016

| Variable                            | Total Practices, No. |         |        | Any Advanced Practice Clinician, % |       |        | Any NP, % |      |        | Any PA, % |      |        |
|-------------------------------------|----------------------|---------|--------|------------------------------------|-------|--------|-----------|------|--------|-----------|------|--------|
|                                     | 2008                 | 2016    | Change | 2008                               | 2016  | Change | 2008      | 2016 | Change | 2008      | 2016 | Change |
| Specialty practices <sup>a</sup>    | 132 682              | 165 655 | 23.2   | 28.3                               | 21.7  | 14.4   | 19.2      | 32.6 | 11.6   | 14.0      | 20.3 |        |
| Medical specialties                 | 87 178               | 109 125 | 20.2   | 23.3                               | 15.7  | 13.6   | 16.3      | 19.9 | 8.3    | 9.9       | 19.3 |        |
| Surgical specialties <sup>b</sup>   | 22 881               | 22 185  | 17.8   | 20.6                               | 15.8  | 5.8    | 7.7       | 32.6 | 13.6   | 15.3      | 12.0 |        |
| Multispecialty                      | 22 623               | 34 345  | 40.5   | 49.0                               | 20.9  | 26.3   | 35.5      | 34.9 | 22.4   | 26.1      | 16.4 |        |
| Psychiatry                          | 12 909               | 16 535  | 14.7   | 17.4                               | 18.4  | 13.1   | 15.9      | 20.9 | 2.2    | 2.7       | 19.2 |        |
| Obstetrics/gynecology               | 12 676               | 13 148  | 29.5   | 29.3                               | -0.7  | 25.3   | 25.3      | 0.2  | 6.1    | 6.5       | 5.7  |        |
| Ophthalmology                       | 9939                 | 10 505  | 0.8    | 0.7                                | -10.8 | 0.3    | 0.3       | 3.7  | 0.6    | 0.5       | -9.1 |        |
| Cardiology                          | 6142                 | 8483    | 30.3   | 31.0                               | 2.4   | 22.1   | 24.3      | 9.6  | 12.7   | 12.9      | 1.8  |        |
| Orthopedic surgery                  | 6758                 | 7293    | 28.0   | 29.1                               | 3.9   | 4.9    | 7.0       | 43.0 | 25.3   | 25.4      | 0.6  |        |
| Generalsurgery                      | 6213                 | 6400    | 11.2   | 13.8                               | 24.0  | 5.4    | 7.6       | 40.1 | 6.6    | 7.5       | 14.6 |        |
| Neurology                           | 3814                 | 5162    | 13.8   | 21.3                               | 54.2  | 9.5    | 15.6      | 64.5 | 5.4    | 8.2       | 52.4 |        |
| Plastic surgery                     | 6067                 | 4177    | 6.4    | 9.8                                | 54.2  | 2.7    | 3.8       | 39.8 | 3.9    | 6.4       | 62.9 |        |
| Dermatology                         | 5428                 | 6041    | 27.4   | 36.3                               | 32.5  | 8.4    | 11.5      | 36.8 | 21.7   | 29.5      | 35.6 |        |
| Gastroenterology                    | 3873                 | 5496    | 25.1   | 28.7                               | 14.2  | 15.4   | 19.2      | 24.7 | 12.5   | 14.4      | 15.1 |        |
| Primary care practices <sup>c</sup> | 68 317               | 69 755  | 28.4   | 35.3                               | 24.3  | 18.8   | 26.1      | 38.8 | 12.5   | 14.6      | 16.8 |        |
| Family practice                     | 30 322               | 31 936  | 36.7   | 44.8                               | 22.1  | 22.4   | 31.6      | 41.0 | 18.4   | 21.0      | 13.9 |        |
| Internalmedicine                    | 22 514               | 22 424  | 18.3   | 23.9                               | 30.8  | 12.0   | 17.6      | 46.2 | 7.7    | 9.3       | 21.3 |        |
| Pediatrics                          | 12 164               | 12 939  | 27.9   | 34.3                               | 22.8  | 23.0   | 29.3      | 27.3 | 7.3    | 9.0       | 22.4 |        |

Abbreviations: NP, nurse practitioner; PA, physician assistant.

<sup>a</sup>Specialty practices include medical specialties: addiction medicine, adolescent medicine, aerospace medicine, allergy/immunology, anesthesiology, cardiology, critical care medicine, dermatology, dialysis, emergency medicine, endocrinology, gastroenterology, general preventive medicine, genetic specialist, gynecologic oncology, holistic medicine, infectious disease, nephrology, neurology, nuclear medicine, obstetrics/gynecology, occupational medicine, oncology/hematology, ophthalmology, otolaryngology, pain management, physical medicine/rehab, psychiatry, pulmonology, rheumatology, sleep medicine, sports medicine, urology, vascular and interventional radiology.

<sup>b</sup>Surgical specialties include bariatrics, colorectal surgery, general surgery, head and neck surgery, neurological surgery, orthopedic surgery, plastic surgery, thoracic surgery, transplant surgery, trauma surgery, and vascular surgery.

<sup>c</sup>Primary care includes family practice, general practice, geriatric medicine, internal medicine, internal medicine/pediatrics, and pediatrics.