

# References

## 1. Poor Quality and Unnecessary Referrals

- a. [http://www.mayoclinicproceedings.org/article/S0025-6196\(13\)00732-5/abstract](http://www.mayoclinicproceedings.org/article/S0025-6196(13)00732-5/abstract) “Comparison of the Quality of Patient Referrals From Physicians, Physician Assistants, and Nurse Practitioners.” Mayo Clinic Proceedings , Volume 88 , Issue 11 , 1266 – 1271 “The quality of referrals to an academic medical center was higher for physicians than for NPs and PAs regarding the clarity of the referral question, understanding of pathophysiology, and adequate pre-referral evaluation and documentation.”

## 2. Increased Diagnostic Imaging

- a. <https://jamanetwork.com/journals/jamainternalmedicine/articlepdf/1939374/loi140120.pdf> “A Comparison of Diagnostic Imaging Ordering Patterns Between Advanced Practice Clinicians and Primary Care Physicians Following Office-Based Evaluation and Management Visits.”
- b. <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1939374> “Advanced practice clinicians [NP/PA] are associated with more imaging services than PCPs [primary care physicians] for similar patients during E&M office visits... this increase may have ramifications on care and overall costs at the population level.”
- c. [https://www.jacr.org/article/S1546-1440\(17\)31291-7/fulltext](https://www.jacr.org/article/S1546-1440(17)31291-7/fulltext) “National Trends in the Utilization of Skeletal Radiography From 2003 to 2015.” Journal of the American College of Radiology (In Press) [www.jacr.org/article/S1546-1440\(17\)31291-7/abstract](http://www.jacr.org/article/S1546-1440(17)31291-7/abstract) “Nonphysician providers (primarily nurse practitioners and physician assistants) increased 441%, and primary care physicians’ rate decreased 33.5%. This raises concerns about... quality.”

## 3. Prescribing Patterns

- a. **Number of prescriptions**  
[http://www.journalofnursingregulation.com/article/S2155-8256\(17\)30071-6/fulltext](http://www.journalofnursingregulation.com/article/S2155-8256(17)30071-6/fulltext)  
“Prescribing Practices by Nurse Practitioners and Primary Care Physicians: A Descriptive Analysis of Medicare Beneficiaries.” Journal of Nursing Regulation, Volume 8, Issue 1, 21-30. “Differences in prescribing patterns were found for the number of prescriptions and for the duration of the prescriptions (days’ supply per claim). NP beneficiaries received, on average, approximately one more 30-day prescription per year than PCP beneficiaries. The mean duration for an NP prescription claim was 3

days shorter than that for a PCP prescription claim, indicating that NP beneficiaries need refills sooner than PCP beneficiaries. This pattern existed in most drug classes and was more pronounced in behavioral drug classes, such as antidepressants, antipsychotics, psychotherapeutics, and opioids and in patients with more comorbidities.”

**b. Increased Antibiotic Prescribing**

- i.** “Patient, Provider, and Practice Characteristics Associated with Inappropriate Antimicrobial Prescribing in Ambulatory Practices.” (2018) *Infection Control & Hospital Epidemiology*, 1-9. doi:10.1017/ice.2017.263  
<https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/patient-provider-and-practice-characteristics-associated-with-inappropriate-antimicrobial-prescribing-in-ambulatory-practices/2E40A4927EAD8BoA624B8F169E8F4D39> “After adjustment, adult patients seen by an advanced practice practitioner were 15% more likely to receive an antimicrobial than those seen by a physician...Our results suggest that patient, practice, and provider characteristics are associated with inappropriate antimicrobial prescribing. Future research should target antibiotic stewardship programs to specific patient and provider populations to reduce inappropriate prescribing compared to a ‘one size fits all’ approach.”
- ii.** “Outpatient Antibiotic Prescribing Among United States Nurse Practitioners and Physician Assistants.” *Open Forum Infectious Diseases*. 2016;3(3)  
<https://academic.oup.com/ofid/article/3/3/ofw168/2593319> “a higher frequency of antibiotic prescribing for visits involving NPs and PAs compared with physician-only visits... higher rates of antibiotic prescribing persisted among visits involving NPs/PAs, even when [the] analysis was restricted to visits for patients with the same diagnosis.”

**c. Opioid Prescribing Patterns**

- i.** M. Hayward (2015) “Doctors aren't top opioid prescribers in NH” *New Hampshire Union Leader* December 22  
<http://www.unionleader.com/Doctors-arent-top-opioid-prescribers-in-NH>
- ii.** L. Chedekel (2015) “Connecticut Nurse Among Highest Prescribers In U.S.” *Heartford Courant Connecticut*, Feb 15  
<http://www.courant.com/health/hc-high-opioid-prescriber-20150220-story.html>

- iii. Payouts for NP malpractice claims increasing (2017)  
<https://www.fiercehealthcare.com/finance/malpractice-claims-nurse-practitioners-payouts-are-increasing-opioids>  
“Many malpractice cases in primary care or family medicine were related to a nurse practitioner's failure to order a medical test, or to obtain and address test results... The report also found that claims related to improper prescribing and management of controlled drugs... increased by about 13%”

**d. Increased Psychotropic Prescribing for Youth**

<https://www.liebertpub.com/doi/10.1089/cap.2017.0112> “There was a 50.9% increase in the proportion of psychotropic medications prescribed by psychiatric NPs (from 5.9% to 8.8%) and a 28.6% proportional increase by non- psychiatric NPs (from 4.9% to 6.3%). By contrast, the proportion of psychotropic medications prescribed by psychiatrists and by non-psychiatric physicians declined (56.9%–53.0% and 32.3%–31.8%, respectively). Conclusions: NPs, relative to physicians, have taken an increasing role in prescribing psychotropic medications for Medicaid-insured youths. The quality of NP prescribing practices deserves further attention.”

**e. Corticosteroid Overuse**

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2673299> “Adverse effects of systemic steroids, even for short term use, are well documented... Future research is needed to further explore regional and national trends in use of corticosteroids for patients..., as it likely represents high-cost, potentially harmful care.” “In multivariate analysis, there were significantly higher odds for steroid prescriptions among patients’ with a medical history of COPD.. asthma,.. bronchitis, and an encounter with a nurse practitioner (NP) or physician assistant (PA).”

**4. Variability of Nurse Competency re: EBP**

- a. <https://sigmapubs.onlinelibrary.wiley.com/doi/pdf/10.1111/wvn.12269> “The First U.S. Study on Nurses’ Evidence-Based Practice Competencies Indicates Major Deficits That Threaten Healthcare Quality, Safety, and Patient Outcomes.” Worldviews on Evidence-Based Nursing, 2018; 15:1, 16–25 “Tremendous variability in EBP (Evidence Based Practice) persists throughout the United States even though research supports that implementation of EBP leads to high-quality cost-effective care.” Results showed: “There is a tremendous need to enhance nurses’ skills so that they achieve competency in EBP in order to ensure the highest quality of care and best population health outcomes.”

**5. Procedure Performance Competency**

- a. <https://jamanetwork.com/journals/jamadermatology/article-abstract/1895672?redirect=true> “Mid-Level Practitioners in Dermatology: A Need for Further Study and Oversight.” JAMA Dermatol. 2014;150(11):1149–1151. doi:10.1001/jamadermatol.2014.1922
- b. Anderson AM, Matsumoto M, Saul MI, Secrest AM, Ferris LK. Accuracy of Skin “Cancer Diagnosis by Physician Assistants Compared With Dermatologists in a Large Health Care System.” <https://jamanetwork.com/journals/jamadermatology/fullarticle/2678685>  
 Compared with dermatologists, PAs 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. 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. “Compared with dermatologists, physician assistants have lower diagnostic accuracy for melanoma.”

## 6. Practice Patterns

### a. Emergency Care

[https://journals.lww.com/jaapa/Fulltext/2018/05000/Emergency\\_physician\\_evaluation\\_of\\_PA\\_and\\_NP.7.aspx](https://journals.lww.com/jaapa/Fulltext/2018/05000/Emergency_physician_evaluation_of_PA_and_NP.7.aspx) “Physician collaborations are considered “scope of practice barriers” in the recent Advanced Practice Registered Nursing Consensus Model” “Regardless of experience level, NPs were reported to use significantly more resources than PAs.” “[There was reported] great variation in PA and NP scope of practice. The results... suggest that new graduate PAs may be more clinically prepared to practice in the ED than new graduate NPs.” [This is notable as] The NP model is described fundamentally as more autonomous than the PA model, not requiring physician collaboration in about half of states and to the extent that some medical centers are run entirely by NPs.”

### b. Primary Care - Diabetes Care

- i. <https://dash.harvard.edu/bitstream/handle/1/12406977/3631881.pdf?sequence=1> “Performance of Primary Care Physicians and Other Providers on Key Process Measures in the Treatment of Diabetes.” Diabetes Care 36:1147–1152, 2013 CONCLUSIONS: PCPs (Primary care physicians) provide better care through higher rates of medication intensification and lifestyle counseling [when compared to NP/PAs].

**c. Primary Care - Treatment decisions for Complex Patients**

- i. [https://www.ajmc.com/journals/issue/2009/2009-06-vol15-n6/ajmc09jun\\_subramania373to380](https://www.ajmc.com/journals/issue/2009/2009-06-vol15-n6/ajmc09jun_subramania373to380) “Treatment decisions for complex patients: differences between primary care physicians and mid-level providers.” American Journal of Managed Care 2009 Jun; 15(6): 373–380. Controlling for current and past BPs and patient characteristics, physicians were significantly more likely than mid-level providers to initiate a treatment change at a visit for an elevated BP (53.8% vs. 36.4%; p=0.001). After controlling for additional visit specific factors, provider practice style, measurement and organizational factors, physicians were still more likely to initiate a treatment change for elevated BP at a visit (52.5% vs. 37.5%; p=0.02). “Mid-level providers were significantly less likely than physicians to change BP treatment for diabetic patients with multiple chronic conditions presenting with elevated BP at a single visit. We could not find good explanations for this difference despite examining a broad array of potential explanatory variables: factors relating to the complexity of the patient, the time available for visits, or attitudes about BP targets and prioritization of BP.”

**d. Primary Care - Resource Utilization (Compared to residents)**

- i. <http://ecp.acponline.org/novdec99/hemani.htm> Greater Resource Utilization (even in 1999 when greater supervision was prevalent) “A Comparison of Resource Utilization in Nurse Practitioners and Physicians.” Effective Clinical Practice: 1999;2:258-265 “In a primary care setting nurse practitioners may use more health care resources than physicians.” This study was completed at a VA clinic. Resource utilization was higher for nurse practitioners than attending physicians and resident physicians.

**7. Other**

- a. <https://hbr.org/2016/12/why-the-best-hospitals-are-managed-by-doctors>
- b. Hospitals hire physician CEOs - <http://www.modernhealthcare.com/article/20140510/MAGAZINE/305109988>
- c. Improved performance of ACOs led by physicians <https://jamanetwork.com/journals/jama/fullarticle/1861359>