

# Clinical Pharmacists Improve Patient Outcomes and Expand Access to Care

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The United States Public Health Service National Clinical Pharmacy Specialist Committee issues a report on the impact of pharmacy-managed clinics across the Bureau of Prisons, Immigration and Customs Enforcement, Indian Health Service, and US Coast Guard.

The US is in the midst of a chronic disease crisis. According to the latest published data available, 60% of Americans have at least 1 chronic condition, and 42% have  $\geq 2$  chronic conditions.<sup>1</sup> Estimates by the Health Resources and Services Administration (HRSA) indicate a current shortfall of 13 800 primary care physicians and a projected escalation of that shortage to be between 14 800 and 49 300 physicians by the year 2030.<sup>2</sup>

The US Public Health Service (USPHS) has used pharmacists since 1930 to provide direct patient care to underserved and vulnerable populations. Clinical pharmacists currently serve in direct patient care roles within the Indian Health Service (IHS), Federal Bureau of Prisons (BOP), Immigration and Customs Enforcement (ICE), and the United States Coast Guard (USCG) in many states (Figure). These pharmacists play a vital role in improving access to care and delivering quality care by managing acute and chronic diseases in collaborative practice settings and pharmacist-managed clinics.

It has previously been reported that in the face of physician shortages and growing demand for primary health care providers, pharmacists are well-equipped and motivated to meet this demand.<sup>3</sup> A review of the previous 2 years of outcomes reported by clinical pharmacists certified through the USPHS National Clinical Pharmacy Specialist (NCPS)

Committee are presented to demonstrate the impact of pharmacists in advancing the health of the populations they serve and to showcase a model for ameliorating the ongoing physician shortage.

## BACKGROUND

The USPHS NCPS Committee serves to promote uniform competency among clinical pharmacists by establishing national standards for protocols, collaborative practice agreements (CPAs), credentialing and privileging of pharmacists, and by collecting, reviewing, and publishing health care outcomes. The committee, whose constituents include pharmacist and physician subject matter experts from across USPHS agencies, reviews applications and protocols and certifies pharmacists (civilian and uniformed) to recognize an advanced scope of practice in managing various diseases and optimizing medication therapy. NCPS-certified pharmacists manage a wide spectrum of diseases, including coagulopathy, asthma, diabetes mellitus (DM), hepatitis C, HIV, hypertension, pain, seizure disorders, and tobacco use disorders.

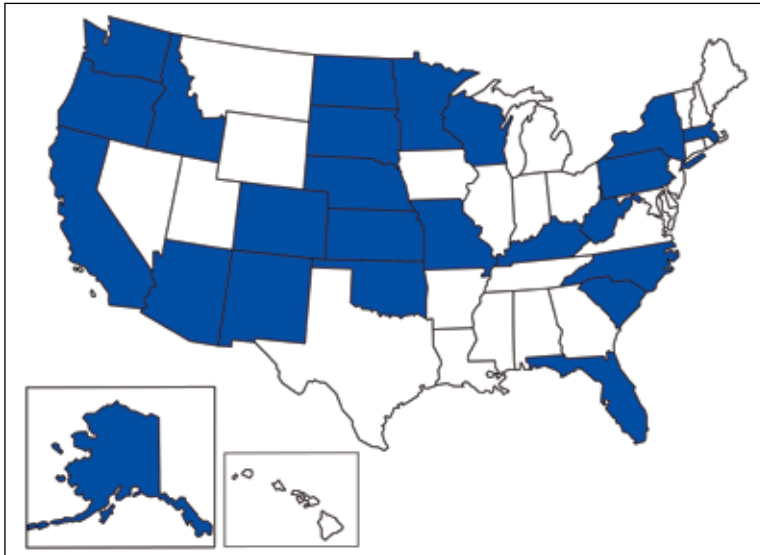
Clinical pharmacists practicing chronic disease management establish a clinical service in collaboration with 1 or more physicians, physician assistants, or nurse practitioners. In this collaborative practice, the health care practitioner(s) refer

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**FIGURE** States With NCPS Pharmacists Representation (blue)



**TABLE 1** National Clinical Pharmacy Specialist Committee Data

| Clinic Types      | Outcome Reports, No. | Patient Visits, No. |
|-------------------|----------------------|---------------------|
| Anticoagulation   | 100                  | 68 255              |
| Diabetes mellitus | 30                   | 16 518              |
| Hypertension      | 16                   | 7997                |
| HIV               | 6                    | 1532                |
| Tobacco cessation | 29                   | 9773                |

patients to be managed by a pharmacist for specific medical needs, such as anticoagulation management, or for holistic medication-focused care (eg, cardiovascular risk reduction, DM management, HIV, hepatitis, or mental health). The pharmacist may order and interpret laboratory tests, check vital signs, perform a limited physical examination, and gather other pertinent information from the patient and the medical record in order to provide the best possible care to the patient.

Medications may be started, stopped, or adjusted, education is provided, and therapeutic lifestyle interventions may be recommended. The pharmacist-run clinic provides the patient more frequent interaction with a health care professional (pharmacist) and focused disease management.

As a result, pharmacists increase access to care and allow the medical team to handle a larger panel of patients as the practitioner delegates specified diseases to the pharmacist-managed clinic(s). The number of NCPS-certified pharmacists grew 46% from 2012 (n = 230) to 2017 (n = 336), reflecting an evolution of pharmacists' practice to better meet the need of patients across the nation.

**METHODS**

The NCPS Committee requires NCPS pharmacists to report data annually from all patients referred for pharmacist management for specific diseases in which they have been certified. The data reflect the patient's clinical outcome goal status at the time of referral as well as the same status at the end of the reporting period or on release from the pharmacist-run clinic. These data describe the impact prescribing pharmacists have on patients reaching clinical outcome goals acting as the team member specializing in the medication selection and dosing aspect of care.

These records were reviewed for the fiscal year (FY) periods of October 1, 2015 to September 30, 2016 (FY 2016) and October 1, 2016 to September 30, 2017 (FY 2017). A systematic review of submitted reports resulted in 181 reports that included all requested data points for the disease as published here for FYs 2016 and 2017. These include 66 reports from FY 2016 and 115 reports from FY 2017; they cover 76 BOP and IHS facilities located across 24 states. Table 1 shows the number of outcome reports collected from 104 075 patient visits in pharmacist-run clinics in FYs 2016 and 2017.

**RESULTS**

The following tables represent the standardized outcomes collected by NCPS-certified pharmacists providing direct patient care. Patients on anticoagulants (eg, warfarin) require special monitoring and education for drug interactions and adverse effects. NCPS-certified pharmacists were able to achieve a mean patient time in therapeutic range (TTR) of 67.6% (regardless of indication) over the 2 years (calculated per each facility by Rosendaal method of linear

interpolation then combined in a weighted average per visit). The TTR produced by NCPS-certified pharmacists are consistent with *Chest* Guidelines and Expert Panel Report suggesting that TTR should be between 65% and 70%.<sup>4</sup> Table 2 shows data from 100 reports with 68 255 patient visits for anticoagulation management.

DM management can be complex and time-intensive. NCPS data indicate pharmacist intervention resulted in a mean decrease in hemoglobin A<sub>1c</sub> (HbA<sub>1c</sub>) of 1.8% from a baseline of 10.2% (decrease calculated per each facility then combined by weighted average per visit). Table 3 shows data from 30 reports with 16 518 patient visits for DM care.

In addition to diet and exercise, medication management plays a vital role in managing hypertension. Patients managed by an NCPS-certified pharmacist experienced a mean decrease in blood pressure from 144/83 to 133/77, putting them in goal for both systolic and diastolic ranges (decrease calculated per each facility then combined by weighted average per visit). Table 4 shows data from 16 reports and 7997 patient visits for treatment of hypertension.

HIV viral suppression is vital in order to best manage patients with HIV and reduce the risk of transmission. Pharmacist-led clinics have shown a 32.9% absolute improvement in patients at goal (viral load < 50 copies/mL), from a mean baseline of 46.0% to a mean final assessment of 71.6% of patients at goal (combined by weighted average visits). Table 5 shows data from 6 reports covering 1532 patient encounters for management of HIV.

Nicotine dependence includes the use of cigarettes, cigars, pipe tobacco, chewing tobacco, and vaping products containing nicotine. NCPS-certified pharmacists have successfully helped patients improve their chance of quitting, with a 6-month quit rate of 22.2% (quit rate calculated per each facility then combined by weighted average by visits), which is higher than the national average of 9.4% as reported by the Centers for Disease and Control and Prevention.<sup>5</sup> Table 6 shows 29 reports covering 9773 patient visits for treatment of nicotine dependence.

**TABLE 2** Anticoagulation Clinic Data

| Fiscal Years | Reporting Facilities, No. | Patient Visits, No. | Total Patients, No. | Pharmacist Providers, No. | Mean TTR by Clinic |
|--------------|---------------------------|---------------------|---------------------|---------------------------|--------------------|
| 2016         | 37                        | 27 548              | 2039                | 211                       | 66.7%              |
| 2017         | 63                        | 40 707              | 3156                | 368                       | 68.1%              |

Abbreviation: TTR, time in therapeutic range.

**TABLE 3** Diabetes Mellitus Clinic Data

| Fiscal Years | Reporting Facilities, No. | Patient Visits, No. | Total Patients, No. | Pharmacist Providers, No. | Mean HbA <sub>1c</sub> Baseline, % | Mean HbA <sub>1c</sub> Change, % |
|--------------|---------------------------|---------------------|---------------------|---------------------------|------------------------------------|----------------------------------|
| 2016         | 11                        | 7008                | 840                 | 36                        | 10.2                               | -1.8                             |
| 2017         | 19                        | 9510                | 2458                | 79                        | 10.1                               | -1.7                             |

Abbreviation: HbA<sub>1c</sub>, hemoglobin A<sub>1c</sub>.

## DISCUSSION

These data demonstrate the ability of advanced practice pharmacists in multiple locations within the federal sector to improve targeted clinical outcomes in patients with varying diseases. These results are strengthened by their varied origins as well as the improvements observed across the board. Limitations include the general lack of a comparable dataset, manual method of self-reporting by the individual facilities, and the relatively limited array of diseases reported. Although NCPS-certified pharmacists are currently providing care for patients with hepatitis C, asthma, seizure, pain and other diseases not reported here, there are insufficient data collected for FYs 2016 and 2017 to merit inclusion within this report.

Pharmacists are trusted, readily available medication experts. In a clinical role, NCPS-certified pharmacists have increased access to primary care services and demonstrated beneficial impact on important health outcomes as exhibited by the data reported above. Clinical pharmacy is a growing field, and NCPS has displayed continual growth in both the number of NCPS-certified pharmacists and the number of patient encounters performed by these providers. As more pharmacists in all settings collaborate with medical providers to offer high-quality clinical care, these providers will have more opportunity to delegate disease management. Continued reporting of clinical pharmacy

**TABLE 4** Hypertension Clinic Data

| Fiscal Years | Reporting Facilities, No. | Patient Visits, No. | Patients, No. | Pharmacist Providers, No. | Baseline SBP, mean, mm Hg | Baseline DBP, mean, mm Hg | Change in SBP, mm Hg | Change in DBP, mm Hg |
|--------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------------|----------------------|----------------------|
| 2016         | 5                         | 1256                | 278           | 14                        | 143                       | 84                        | -10.0                | -5.8                 |
| 2017         | 11                        | 6741                | 2190          | 59                        | 144                       | 83                        | -11.2                | -6.1                 |

Abbreviation: DBP, diastolic blood pressure; SBP, systolic blood pressure.

**TABLE 5** HIV Clinic Data

| Fiscal Years | Reporting Facilities, No. | Patient Visits, No. | Patients, No. | Pharmacist Providers, No. | Baseline Viral Load, mean < 50 copies/mL, % | End Viral Load, mean < 50 copies/mL, % | Absolute Change in Patients at Goal | Relative Change in Patients at Goal, % |
|--------------|---------------------------|---------------------|---------------|---------------------------|---|--|-------------------------------------|--|
| 2016         | 1                         | 527                 | 145           | 4                         | 41.2  | 58.8                                   | 17.6                                | 42.8                                   |
| 2017         | 5                         | 1005                | 171           | 8                         | 46.9  | 82.9                                   | 36.0                                | 76.7                                   |

**TABLE 6** Nicotine Dependence Clinic Data

| Fiscal Years | Reporting Facilities, No. | Patient Visits, No. | Patients, No. | Pharmacist Providers, No. | 6-Month Cessation Rate, mean, % |
|--------------|---------------------------|---------------------|---------------|---------------------------|---------------------------------|
| 2016         | 12                        | 3699                | 1537          | 69                        | 21.9                            |
| 2017         | 17                        | 6074                | 2921          | 111                       | 22.4                            |

outcomes is expected to increase confidence in pharmacists as primary care providers, increase utilization of pharmacy clinical services, and assist in easing the burden of primary care provider shortages across our nation.

Although these outcomes indicate demonstrable benefit in patient-centered outcomes, the need for ongoing assessment and continued improvement is not obviated. Future efforts may benefit from a comparison of alternative approaches to better facilitate the establishment of best practices. Alignment of clinical outcomes with the Centers for Medicare and Medicaid Services (CMS) Electronic Clinical Quality Measures, where applicable, also may prove beneficial by automating the reporting process and thereby decreasing the burden of reporting as well as providing an avenue for standard comparison across multiple populations. Clinical pharmacy interventions have positive outcomes based on the NCPS model, and the NCPS Committee invites other clinical settings to report outcomes data with which to compare.

## CONCLUSIONS

The NCPS Committee has documented positive outcomes of clinical pharmacy intervention and anticipates growth of the pharmacy profession as additional states and health systems recognize the capacity of the pharmacist to provide high-quality, multidisciplinary patient care. Clinical pharmacists are prepared to address critical health care needs as the US continues to face a PCP shortage.<sup>2</sup> The NCPS Committee challenges those participating in clinical pharmacy practice to report outcomes to amplify this body of evidence.

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### Author disclosures

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### Disclaimer

The opinions expressed herein are those of the authors and do not necessarily reflect those of *Federal Practitioner*, Frontline Medical Communications Inc., the US Government, or any of its agencies.

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