

# Clinical pharmacy specialists providing consistent comprehensive medication management with increased efficiency through telemedicine during the COVID19 pandemic

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## Abstract

**Introduction:** The Veterans Affairs (VA) has been at the forefront of harnessing the skills of clinical pharmacy specialists (CPS) in patient-aligned care teams (PACT) to improve patient care outcomes and create access for veterans. With the unfortunate arrival of Coronavirus disease 2019 (COVID19), PACT CPS were duty-bound to expand telehealth services at an accelerated rate. The purpose of this quality improvement analysis is to compare CPS efficiency as well as some objective patient metrics to assess for a change in the quality of care. This is the first study to compare the efficiency and quality of care by CPS in the VA pre-COVID19 and during the COVID19 pandemic.

**Methods:** This is a retrospective review of PACT CPS comprehensive medication management from 3/10/19 to 11/30/19 and 3/10/20 to 11/30/20. Data points focused on clinic encounters, patient accountability to appointments, disease state expansion, and markers of disease-state management. Given diabetes and hypertension are the main disease states managed by most PACT CPS, the study evaluated changes in hemoglobin A1c (HbA1c) and blood pressure (BP) between the two cohorts as well. Data were analyzed using GraphPad Software or Microsoft Excel. A student T-test was used for continuous data and Chi-squared or Fishers Exact for nominal data.

**Results:** The total number of PACT CPS encounters increased 32% in 2020, and the number of unique patients increased by 12%. There were a statistically significant increase in telephone and direct-to-consumer (DCT) video visits. The rates of no shows and cancellations significantly decreased between 2019 and 2020. There was no difference in the average change in HbA1c or average blood pressure between the two study groups.

**Conclusions:** When PACT CPS services transitioned from primarily face-to-face visits to all virtual care, the consistency of care improved, and the quality of care was not compromised.

## KEYWORDS

ambulatory care, comprehensive medication management, COVID19, pharmacist, telehealth, telemedicine

## 1 | INTRODUCTION

The Veterans Affairs (VA) has been at the forefront of harnessing the skills of clinical pharmacy services to improve patient care outcomes and create access for veterans. Since the integration of clinical pharmacy specialists (CPS) into the patient-centered medical home model (PCMH) known within the VA as patient-aligned care team (PACT), literature has continued to show the impact CPS have in primary care when involved in comprehensive medication management (CMM).<sup>1-10</sup> The integration of PACT CPS into primary care in the VA has served to enhance the PCMH.<sup>11,12</sup>

While CPS services expanded and showed benefit in patient care metrics, it became evident there remained a veteran population that was underserved. Clinical pharmacy services were often unavailable in smaller, rural clinics. In recognition of this, CPS services through telemedicine in the VA emerged through adopting both direct-to-consumer (DTC) and facilitated telemedicine modalities to assist in reaching underserved populations. While telephonic care in between face-to-face appointments was already a key component for standard CMM, video telemedicine was an innovative method of delivering healthcare services. The VA is a pioneer in telehealth advancement to reach and improve access for rural veterans.<sup>13,14</sup> The 2018 “Maintaining Internal Systems and Strengthening Integrated Outside Networks” (MISSION) Act was signed in law prior to the COVID19 pandemic and had a goal of all VA providers in mental health and primary care service lines capable and experienced with providing video visits.<sup>14</sup> To address the impending doubt that the quality of care could be maintained through telemedicine modalities with no in-person visits, two observational analyses were conducted at a Tennessee VA medical center. Results illustrated that DTC and facilitated telemedicine visits were just as effective at achieving patient healthcare goals as in-person visits.<sup>15,16</sup> Evidence continued to surface as outlined by Niznik and colleagues in a meta-analysis of practices with pharmacists providing telemedicine services. Out of the 34 initiatives reviewed, 26 showed a net positive impact and seven showed an overall neutral impact.<sup>17</sup>

As telemedicine utilization diffused across healthcare systems, many benefits were widely recognized. One patient satisfaction survey indicated that the majority of patients treated through DTC telemedicine were more or just as satisfied compared to traditional in-person visits. Themes included convenience, quicker appointment times, and an overall positive experience. Only 1.5% of survey participants were less satisfied with telemedicine citing difficulties with technology or personal preference.<sup>18</sup> While the patient population of this survey differs from that of the typical veteran population, the benefits remain applicable. Despite the progressively changing perception and initiatives to catalyze utilization, DTC telemedicine accounted for less than 30% of overall PACT CPS encounters at the Tennessee Valley VA in 2019.

With the unfortunate arrival of the Coronavirus disease 2019 (COVID19) pandemic, PACT CPS were duty-bound to expand telehealth services at an accelerated rate. During the initial surge of the pandemic, many PACT CPS provided full time telemedicine in the

remote setting of home. Because of the infrastructure in place after enactment of the MISSION act, VA providers were able to quickly adapt to telehealth modalities of care to ensure continuity for every veteran.<sup>19</sup> The purpose of this quality improvement analysis is to compare PACT CPS efficiency via patient encounter data as well as to review some objective patient metrics to evaluate if quality in regards to outcomes were compromised during the COVID19 pandemic. This is the first study to our knowledge to compare the efficiency and quality of care by clinical pharmacists in PACT in the VA pre-COVID19 and during the COVID19 pandemic.

## 2 | METHODS

This is a retrospective review of Tennessee Valley PACT CPS CMM from 3/10/19 to 11/30/19 and 3/10/20 to 11/30/20. This study period was chosen to capture a clinical snapshot of pre-COVID19 and COVID19 pandemic information. During each study period, PACT CPS received a constant inflow of new referrals as well as continuing to manage patients established with a CPS prior to the selected study period. New patients were established solely through virtual care during the pandemic. Designated full-time employment (FTE) did not change between study periods. Data points requested focused on clinic encounters, patient accountability to appointments, disease state expansion, and markers of disease-state management. Specific data points collected were: CPS pharmacotherapy clinic patient encounters to include in-person, telephone, VA Video Connect (VVC), which is the VA's method for DTC telemedicine, and Clinical Video Telehealth (CVT) which is the VA's method of facilitated telemedicine; number of unique patients treated during each study period; cancellations and no show rates during each study period; diseases states managed, insulin use, and demographic data including age, race, and gender. Given diabetes and hypertension are the main disease states managed by most PACT CPS, the study evaluated changes in hemoglobin A1c (HbA1c) and blood pressure (BP) between the two-time cohorts as well. Hemoglobin A1c was measured by the average first and last documented lab and vitals values in the timeframes of each year. Patients were excluded from disease state data analysis if there were not two values documented within the study period. Data were analyzed using GraphPad Software or Microsoft Excel. A Student t test was used for continuous data and Chi-squared or Fishers Exact for nominal data.

## 3 | RESULTS

The total number of PACT CPS encounters at Tennessee Valley VA increased in 2020 to 21,491 from 16,283 in 2019, a 32% increase, and the number of unique patients increased from 4402 in 2019 to 4940 in 2020, a 12% increase as well. The majority of patients were white, >90% male, with an average age of 65 and 66 years in each cohort. See Table 1 for demographic characteristics.

	2019	2020	P-value
Unique patients	4402	4940	
Age Ave. (SD)	66.7 (10.5)	65.6 (11.0)	>.0001
Race n (%)			
White	3239 (73.6)	3551 (71.9)	.07
Black or African American	806 (18.3)	917 (18.6)	.77
Declined to answer/unknown	265(6.0)	368 (7.5)	.007
Multiple races (2 or more listed)	37 (0.8)	37 (0.7)	.7
Native Hawaiian or other pacific islander	25 (0.6)	27 (0.5)	.89
American Indian or Alaska Native	19 (0.4)	28 (0.6)	.38
Asian	11 (0.3)	12 (0.2)	1.0
Gender n (%)			
Male	4189 (95)	4641 (94)	.012
Female	213 (5)	299 (6)	
Patients on Insulin	2703 (61.4)	2743 (55.5)	.0001

TABLE 1 Patient demographics

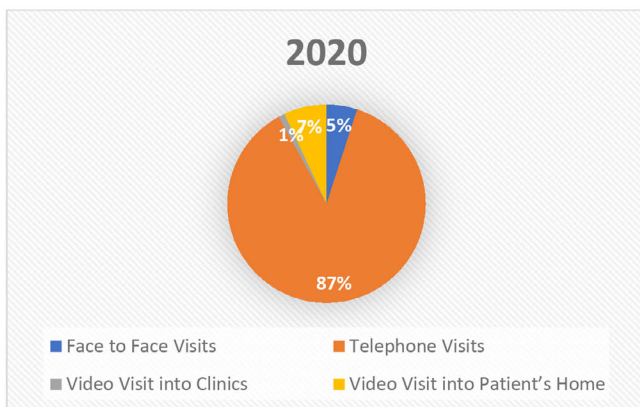
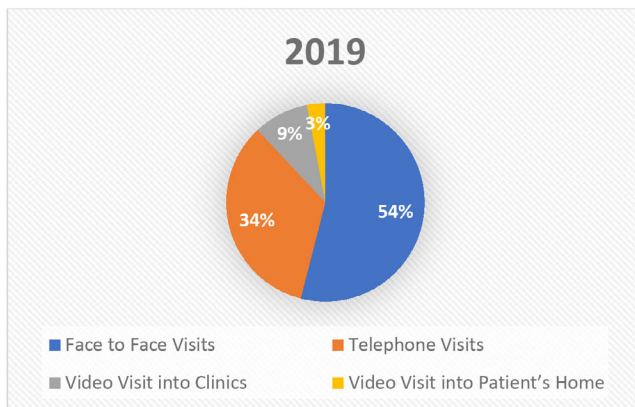


FIGURE 1 Types of encounters

As expected with the COVID19 pandemic, face-to-face visits decreased from 56% in 2019 to just 5% in 2020 ( $P = .0001$ ), while the amount of telephone visits increased from 32% in 2019 to 87% of all encounters in 2020 ( $P = .0001$ ). Video visits into clinics decreased from 9% to 1% ( $P = .0001$ ) and video visits into patients' homes

TABLE 2 Types of encounters

VISITS n (%)	2019	2020	P-value
Total	16283	21491	
Face to face visits	9099 (56)	1093 (5)	.0001
Telephone visits	5230 (32)	18715 (87)	.0001
Video visit into clinics	1496 (9)	151 (1)	.0001
Video visit into patient's home	458 (3)	1532 (7)	.0001
No shows	1268 (6)	1054 (4)	.0001
Cancelled by patient	2690 (13)	2032 (8)	.0001

TABLE 3 Diagnoses addressed at each encounter

Diagnoses addressed n (%)	2019	2020
Total	34147	37403
Diabetes	14279 (41.8)	19588 (52.4)
Hypertension	9299 (27.2)	8669 (23.2)
Hypercholesterolemia	8273 (24.2)	6595 (17.6)
Other	1376 (4.0)	690 (18.4)
Coronary artery disease	212 (0.6)	637 (17.0)
Chronic obstructive pulmonary disease	160 (0.5)	109 (2.9)
Tobacco cessation	150 (0.5)	790 (2.1)
Heart failure	110 (0.3)	74 (0.2)
Anticoagulation	107 (0.3)	87 (0.2)
Kidney disease	77 (0.2)	53 (0.1)
Pain	47 (0.1)	75 (0.2)
Gout	22 (<0.1)	20 (<0.1)
Sleep apnea	20 (<0.1)	6 (<0.1)
Thyroid	8 (<0.1)	6 (<0.1)
Erectile dysfunction	7 (<0.1)	4 (<0.1)

**TABLE 4** Changes in hemoglobin A1c and blood pressure

	2019	2020	P-value
A1c first average	8.52	8.38	
A1c last average	7.95	7.8	
Change in A1c	0.57	0.58	0.94
1st SBP average	131.6	133.9	
Last SBP average	128.5	130.7	
Change in SBP	3.1	3.2	0.97
1st DBP average	76.6	77.8	
Last DBP average	75.5	75.8	
Change in DBP average	1.1	2	0.3

Abbreviations: A1c, hemoglobin A1c; DBP, diastolic blood pressure; SBP, systolic blood pressure.

increased from 3% to 7% of overall CPS encounters ( $P = .0001$ ) (see Figure 1). The rates of no shows and cancellations significantly decreased between 2019 and 2020 (see Table 2).

Diabetes was still the primary diagnosis encountered by the CPS with 14,279 in 2019 and 19,588 in 2020, a 37% increase. In 2019, hypertension management was part of 9299 visits compared to 8669 in 2020. See Table 3 for other diagnoses encountered by CPS in the given timeframes. The average reductions in A1c were 0.57% in the 2019 cohort and 0.58% in the 2020 cohort,  $P = .94$ . The average reductions in SBP were 3.1mmHg and 3.2mmHg ( $P = .968$ ) in 2019 and 2020, respectively, with a reduction in DBP of 1.1 mmHg in 2019 and 2 mmHg in 2020 ( $P = .3$ ), see Table 4.

## 4 | DISCUSSION

COVID19 quickly changed the direct patient care model in 2020. Prior to COVID19, the majority of CPS encounters in PACT at this VA system were face-to-face, and this drastically decreased as expected in 2020. Despite this substantial decrease in face-to-face encounters, there was a 32% increase in total number of visits from 2019 to 2020 and an increase in number of unique patients with a CPS visit. Not only did the number of encounters and percent of virtual care increase, but also the no show and cancellation rates significantly decreased. This shows that in a large VA healthcare system with 24 full time CPS in PACT whose PACT assignment nor hours changed related to COVID, the shift in modality of patient care did not compromise the impact of CPS interventions on patient care. Additionally, the number of video visits into patients' homes increased greater than 200%. This is a significant advancement as it potentially indicates that this primarily elderly veteran population is capable of becoming increasingly comfortable with virtual modalities of care. Furthermore, even with a significant increase in the number of unique patients treated and an increase in number of patient encounters, the quality of care was not decreased. In fact, expansion was seen in disease state management with a greater than 400% rise in encounters for tobacco cessation. Diabetes and hypertension were still the top

disease states managed by clinical pharmacists; however, the efficiency of telemedicine undoubtedly abetted the PACT CPS to expand beyond traditional management.

The similarities in change in A1c and BP values in 2019 and 2020 show that these specific outcomes were not affected negatively. Data collected was all comers as opposed to newly initiated with CPS services and the final average A1c was less than 8% both years with final blood pressure <140/90.<sup>20</sup> Of note, there was a statistically significant difference in age, gender, unknown race patients, and patients on insulin, potentially illustrating a diversifying veteran population. Previous literature has consistently shown the impact clinical pharmacists have in primary care when involved in CMM,<sup>1-10</sup> particularly in VA medical centers. The integration of PACT CPS's into primary care in the VA has allowed for increased access for veterans to primary care services and has served to enhance the PCMH.<sup>11,12</sup> In an attempt to further improve access to primary care, clinical pharmacists have been at the forefront of implementing telehealth technology to enhance patient care, especially since the American College of Clinical Pharmacy (ACCP) published a white paper in 2018 encouraging utilization of telehealth in CMM to align with the Standards of Practice for Clinical Pharmacists<sup>21</sup> and provided guidelines for implementation and evaluation of telehealth practices.<sup>22</sup> Many studies have shown the benefit of clinical pharmacists providing CMM through telemedicine<sup>15,23,24</sup> with a meta-analysis in 2018 identifying 34 studies of pharmacists providing direct patient care via telemedicine with an outcomes and comparator arm, with 33 out of 34 showing a positive or neutral impact.<sup>17</sup> However, until the COVID19 pandemic, the integration of virtual modalities into patient care was an extra luxury for improving patient care, rather than a necessity out of safety concerns. Despite the drastic change in modality of care provided, this data proves that care was not compromised, but overall improved when looking at the number of patients able to be cared for by the CPS with a neutral effect on outcomes like A1c and BP.

A few limitations were identified. First, the study did not distinguish between new referrals and established patients in these two timeframes. The standard of practice regarding new referrals, management, and discharge of patients who are stable and achieving treatment goals in PACT CPS clinics did not change from 2019 to 2020. Therefore, because the number of unique patients increased from 2019 to 2020, it assumed that the number of new referrals to the PACT CPS clinic increased as well; however, this was not defined by the data evaluation. The study also anticipated that the minor changes in A1c and BP were due to pulling a mix of well-established patients and new patients in the clinics in each time period. Additionally, though the study showed that shifting the primary modality of care from face-to-face to virtual has not affected consistency in care or quality of care for the veterans, the veterans' viewpoints and satisfaction with this major shift in provision of care has not yet been assessed. Further long term outcomes data since switching to more virtual care would need to be evaluated, though do not expect any worsening of care based on this and previous studies.<sup>15,23-25</sup>

This study showed that through optimal utilization of telemedicine, more veterans were able to be reached without compromising

outcomes including A1c and BP during a national pandemic. Although a devastating time in healthcare, this is a positive discovery regarding the potential future direction of CPS provided direct patient care in telemedicine while preserving exceptional quality of care.

## 5 | CONCLUSION

When pharmacist-led outpatient CMM clinics transitioned from primarily face-to-face patient care to all virtual care, the consistency and quality of care was not compromised, and actually improved in regard to number of patients seen and number of encounters documented, with a decrease in no show rates. Clinical outcomes of A1c and BP were unchanged between the two time periods.

### CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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### REFERENCES

- VHA PCMH Model Concept Paper, unpublished data, 2010.
- Lindenmeyer A, Hearnshaw H, Vermeire E, Van Royen P, Wens J, Biot Y. Automated Telephone Calls in the Follow-up of Self-Care in Outpatients with Type 2 Diabetes: A Feasibility Study. *J Clin Pharm Ther*. 2006;31(5):409–419.
- Edwards HD, Webb RD, Scheid DC, Britton ML, Armor BL. A pharmacist visit improves diabetes standards in a patient-centered medical home. *Am J Med Qual*. 2012;27(6):529–534. [Epub ahead of print].
- Ladhani NN, Majumbar SR, Johnson JA, et al. Adding pharmacists to primary care teams reduces predicted long-term risk of cardiovascular events in Type 2 diabetic patients without established cardiovascular disease: Results from a randomized trial. *Diabet Med*. 2012;29:1433–1439. <https://doi.org/10.1111/j.1464-5491.2012.03673.x>. [Epub ahead of print].
- Wallgren S, Berry-Caban CS, Bowers L. Impact of clinical pharmacist intervention on diabetes-related outcomes in a military treatment facility. *Ann Pharmacother*. 2012;46(3):353–357.
- Chan CW, Siu SC, Wong CK, Lee VW. A pharmacist care program: Positive impact on cardiac risk in patients with type 2 diabetes. *J Cardiovasc Pharmacol Ther*. 2012;17(1):57–64.
- Warrington L, Ayers P, Baldwin AM, et al. Implementation of a pharmacist-led, multidisciplinary diabetes management team. *Am J Health Syst Pharm*. 2012;69(14):1240–1245.
- Pepper MJ, Mallory N, Coker TN, Chaki A, Sando KR. Pharmacists' impact on improving outcomes in patients with type 2 diabetes mellitus. *Diabetes Educ*. 2012;38(3):409–416.
- Cripps RJ, Johnson W, Cassidy R, Morgan T, Venugopal D, McFarland MS. An evaluation of diabetes-related measures of control after 6 months of clinical pharmacy specialist intervention. *J Pharm Pract*. 2011;24(3):332–338.
- Gatwood JD, Chisholm-Burns M, Davis R, et al. Impact of pharmacy services on initial clinical outcomes and medication adherence among veterans with uncontrolled diabetes. *BMC Health Serv Res*. 2018;18(1):855.
- McFarland MS, Nelson J, Ourth H, et al. Optimizing the primary care clinical pharmacy specialist: Increasing patient access and quality of care within the Veterans Health Administration. *J Am Coll Clin Pharm*. 2020;3:494–500.
- McFarland MS, Lamb K, Hughes J, et al. Perceptions of integration of the clinical pharmacist into the PCMH model by the PCMH team. *J Healthc Qual*. 2018;40(5):265–273.
- Darkins A. The growth of telehealth services in the Veterans Health Administration between 1994 and 2014: A study in the diffusion of innovation. *Telemed e-Health*. 2014;20(9):761–768.
- VA exceeds 1 million video telehealth visits in FY2018: One-year achievement represents a 19% increase over previous year [press release]. Washington, DC: VA Office of Public and Intergovernmental Affairs, 2019 [accessed 2021 Jan 9]. Available from <https://www.va.gov/opa/pressrel/pressrelease.cfm?id=5196>.
- Maxwell LG, McFarland MS, Baker JW, Cassidy RF. Evaluation of the impact of a pharmacist-led telehealth clinic on diabetes-related goals of therapy in a Veteran population. *Pharmacotherapy*. 2016;36(3):348–356.
- Baker J, Forkum W, McNeal J. Utilizing clinical video telehealth to improve access and optimize pharmacists' role in diabetes management. *J Am Pharm Assoc*. 2019;59(2):S63–S66.
- Niznik JD, He H, Kane-Gill SL. Impact of clinical pharmacist services delivered via telemedicine in the outpatient or ambulatory care setting: A systematic review. *Res Soc Adm Pharm*. 2018;14:707–717.
- Taylor L, Capling H, Portnoy JM. Administering a Telemedicine Program. *Curr Allergy Asthma Rep*. 2018;18(11):57.
- Myers US, Birks A, Grubaugh AL, Azon RN. Flattening the curve by getting ahead of it: How the VA healthcare system is leveraging telehealth to provide continued access to care for rural veterans. *J Rural Health*. 2021;37:194–196.
- Veterans Affairs/Department of Defense Clinical Practice Guidelines. (2020). Clinical practice guideline for the diagnosis and management of hypertension in the primary care setting. Available from <https://www.healthquality.va.gov/guidelines/CD/htn/>.
- American College of Clinical Pharmacy (ACCP). Standards of practice for clinical pharmacists. *Pharmacotherapy*. 2014;34:794–797.
- Badowski ME, Wright EA, Bainbridge J, et al. Implementation and evaluation of comprehensive medication management in telehealth practices. *J Am Coll Clin Pharm*. 2020;3:520–531.
- McFarland M, Davis K, Wallace J, et al. Use of home telehealth monitoring with active medication therapy management by clinical pharmacists in veterans with poorly controlled type 2 diabetes mellitus. *Pharmacotherapy*. 2012;32(5):420–426.
- Litke J, Spoutz L, Ahistrom D, et al. Impact of the clinical pharmacy specialist in telehealth primary care. *Am J Health-Syst Pharm*. 2018; 75:928–926.
- Evaluation of the clinical and safety outcomes of face-to-face vs a telephonic model of a pharmacist-led outpatient anticoagulation service. *J Am Coll Clin Pharm*. 2020;3:1444–1450.

**How to cite this article:** Thomas AM, Baker JW, Hoffmann TJ, Lamb K. Clinical pharmacy specialists providing consistent comprehensive medication management with increased efficiency through telemedicine during the COVID19 pandemic. *J Am Coll Clin Pharm*. 2021;4(8):934–938. <https://doi.org/10.1002/jac5.1494>