



NOVEMBER 6, 2015

# ABBEVILLE COMMUNITY PARAMEDICINE EVALUATION REPORT

KEVIN J. BENNETT, PhD  
MATT W. YUEN, MPH  
South Carolina Rural Health Research Center  
University of South Carolina



# Table of Contents

---

<b>Executive Summary</b> .....	2
<b>Overview</b> .....	3
<b>Methods</b> .....	4
<b>Findings</b> .....	6
<b>Patient Breakdown</b> .....	6
<b>Evaluation Objectives Results</b> .....	7
<b>Patient Health Outcomes</b> .....	10
<b>Emergency Services Utilization</b> .....	11
<b>Cost Related Analyses</b> .....	12
<b>Comparing Control Group To CP Patients</b> .....	13
<b>Findings of Interest</b> .....	15
<b>Recommendations</b> .....	16
<b>Program Recommendations</b> .....	16
<b>Process Recommendations</b> .....	17
<b>Personnel Recommendations</b> .....	18
<b>Recommendations Once Funds Are Available</b> .....	19
<b>Appendix</b> .....	20

---

## Executive Summary

---

The Abbeville Community Paramedicine (CP) Program was established in 2013 with a grant from the Duke Endowment and the South Carolina Office of Rural Health (SCORH). Located in rural Abbeville County, SC, the program sought to achieve the following overall goals:

1. Target frequent ED patients to decrease ED use.
2. Better health outcomes among enrolled patients.

The Abbeville CP Program attempted to achieve these goals by utilizing regularly scheduled Community Paramedics to help patients manage their health. By doing so, the Abbeville CP Program sought to make patients within the program healthier.

### Key Evaluation Results

This evaluation was done by the South Carolina Rural Health Research Center (SCRHRC) located in the Arnold School of Public Health in the University of South Carolina, Columbia. SCRHRC sought to determine if the Abbeville CP Program was successful in achieving their goals. SCRHRC worked with the CP Program to help evaluate and troubleshoot with the CP program administrators to help increase the viability of the program. Overall, the CP Program has achieved the goals that were targeted. The following are highlights of the CP Program as of June 30, 2015:

- Has enrolled 75 patients accounting for 773 visits
- Decreased ER utilization by 58.7%
- Decreased IP utilization by 60.0%
- Decreased 30-day readmission rate by 41.2%
- 85% of diabetic patients showing improved health outcomes
- 69.9% of hypertension patients showing improved health outcomes

### Key Recommendations

Unfortunately, during the time of the writing of this report, the Abbeville CP Program was not able to acquire additional grant funding. Therefore, this report will give recommendations based on a future with current funding and staffing within the EMS agency. Some of our key recommendations are:

- Shift the program focus to focus on high emergency department utilizers
- Explore alternative transportation for CP patients
- Explore options for scheduling CP visits and routes
- Alter the visit documentation to improve flow and care management
- Continue to foster community relationships
- Explore methods to improve CP workload issues

## Overview

---

Abbeville County is a rural county encompassing 508 square miles located on the western border of South Carolina. The total population as of the 2010 U.S. Census was 25,417 people. In comparison to other South Carolinians, Abbeville County residents tend to be less educated and more likely to live in poverty, two significant predictors of poor health outcomes. In addition, the Abbeville population is serviced by one critical access hospital, Abbeville Area Medical Center (AAMC).

Abbeville County residents have a higher than average utilization of health care; the 2011 rate per 100,000 of total ED discharges for Abbeville County was 48,257.22 compared to the state rate of 44,368.28. In 2011 at Abbeville Area Medical Center, the ED saw close to 500 patients that had had 3 or more visits to the ED throughout the year and who had been admitted to IP at least once.

In 2013, Abbeville County Emergency Management Services (ACEMS) and AAMC pioneered the Community Paramedicine (CP) Program with the help of the Duke Endowment and South Carolina Office of Rural Health (SCORH). The CP Program utilizes Community Paramedics to serve patients who have the one or more of the following diagnoses and frequently use the ED: Hypertension (HTN), Diabetes (DM), Chronic Heart Failure (CHF), Asthma, and Chronic Obstructive Pulmonary Disease (COPD). The CPs were expected to fill gaps in care for patients, and help manage patients' chronic diseases. During a patient's time in the program, the CP was expected to help link the patient to additional care as needed. The CP program attempted to accomplish better care through the use of the Donabedian Model, to help improve their work.

The Donabedian Model essentially states that quality is measured in three categories: structure, process, and outcomes. For the CP program, structure describes the environment in which the patient lives, resources available to the patient, and where care is given. Process describes what was done to the patient to help them improve. Finally, outcomes speak to the actual patient health outcomes. With the Donabedian Model guiding the CP Program, the CP Program continued to make strides for better clinical outcomes.

In Spring 2014, the South Carolina Rural Health Research Center (SCRHRC), located at the University of South Carolina, Columbia, was contracted to evaluate the CP Program. SCRHRC was contracted on the basis of evaluating whether the CP Program had accomplished their Evaluation Objectives (EO). The EOs were as follows:

1. Address Social Determinants of Health
2. Reduce System Fragmentation
3. Biophysical Approach
4. Adherence Promotion
5. Increase EMS Capacity

To properly evaluate the Abbeville CP Program, SCRHRC employed a mixed methods approach to accomplish the goal of evaluating the program. Also, SCRHRC, guided by the Donabedian Model, collected other data relevant to the CP Program's operation, which this report will show.

## Methods

SCRHRC was contracted in April 2014 to evaluate the following key measures of the Abbeville CP Program as listed in the Abbeville Contract:

1. Address Social Determinants of Health
2. Reduce System Fragmentation
3. Biophysical Approach
4. Adherence Promotion
5. Increase EMS Capacity

### Evaluation Design

The evaluation was designed as a case-control longitudinal study. All the CP patients were part of the experimental group, while the control group was made up of patients that had similar attributes to the CP patients. Data was taken from 2012-2015 to evaluate the CP Program. Data was taken from October 2014 – June 2015 through a:

- Review of the ACEMS EMS records
- Review of AAMC ED and IP medical records
- Review of financial records of both ACEMS and AAMC
- Log of events that occurred during the Abbeville CP Program
- Qualitative interviews given June – July 2015.

In addition, a bi-monthly report was given to program administrators throughout this period to update the current state of the program.

### Data Collection

Data was initially stored on Microsoft Access 2010. However, during the course of the evaluation, it was decided that data should be stored on Microsoft Excel 2010 for efficiency. Please see appendix (Figures 1 and 2) for information on what data was collected from the evaluation. In addition, any qualitative interviews that were taken were stored in Microsoft Word.

The following was information of interest SCRHRC collected:

#### CP Visit Information

Date of Visit		
Date of Birth	Education Given	Primary Care Provider
Gender	BOOST Screening	Seen Primary Care Provider Since Last Visit
Primary Diagnosis	Falls Assessment	Referrals to Physician
Secondary Diagnosis	Home Health Assessment	
Body Weight (lb)		Healthy outcomes project (HOP) Enrollment Status
Blood Glucose	Medication(s)	Referred to an alternate Program
Diastolic BP / Systolic BP	Medication(s)	
Pulse		
Pulse Oximetry		
Respiratory Rate		

Acute Care Visit Information (AAMC Only)

ED Visit Date	IP Visit Date	ED Cost
ED Visit Reason	IP Visit Discharge	IP Cost
	IP Reason	

EMS Visit Information

EMS Use Date	EMS On Scene	EMS Reason
EMS Dispatch Time	EMS Return to Service	

## Findings

### Patient Characteristics

As of June 30, 2015, the CP Program patients were:

### Total Enrolled Patients

**75**

### By Sex

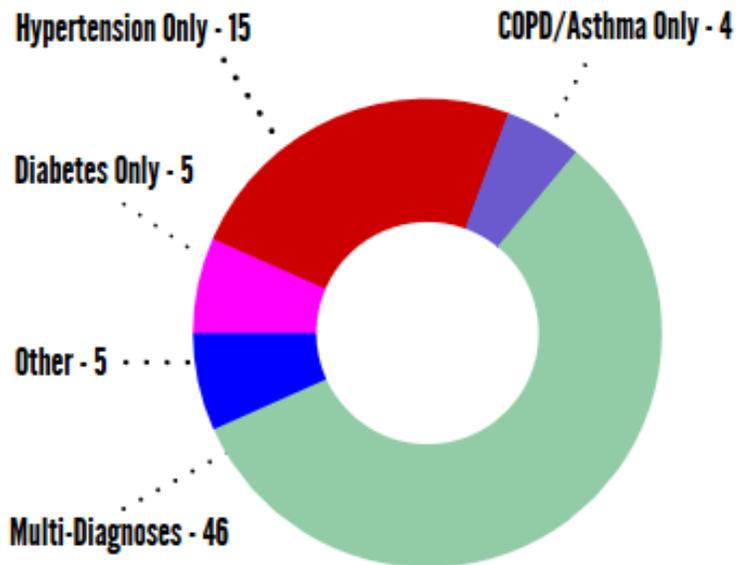


**41**  
Females



**34**  
Males

### Patients By Diagnosis



## Evaluation Objectives Results

This section will be broken down based on each individual goal as noted by the following evaluation objectives (EO):

1. Address Social Determinants of Health
2. Reduce System Fragmentation
3. Biophysical Approach
4. Adherence Promotion
5. Increase EMS Capacity

### EO 1: Address Social Determinants of Health.

Objective	Goal	Results
A. Home Safety Assessment Rate	100% of pts receive Home Safety Assessment	100%
B. BOOST Screening Rate	100% of appropriate pts receive BOOST screening	100%
C. Number of Referrals to Community Services/Resources	50% of pts are connected to one or more community services	58.6%

**Conclusion: EO 1 Was An Overall Success.** The success of EO 1 stemmed from the CP protocol and the training that CPs were given. The CP protocol requires that during a first visit, both a Home Safety Assessment and BOOST Screening is done. The Project BOOST Program is a national initiative led by the Society of Hospital Medicine (SHM) to improve the care of patients as they transition from hospital to home.<sup>1</sup> Because of the protocol requirement, the CP program was successful in achieving EO1a and EO1b. In addition, the training that the CPs were given required them to tour and “embed” with agencies in the community which later proved helpful to accomplishing EO 1c. Based on interviews with the CPs the embedding process made the CPs extremely knowledgeable and comfortable to refer patients to community resources.

### EO 2: Reduce Systems Fragmentation.

Objective	Goal	Results
A. Patient Care Satisfaction Rate	Pt Satisfaction scores greater than 85%	100%
B. Enrollment Rate for Health Affordability Program	100% of pts eligible for Health Affordability Program enrolled	100%
C. Rate of Appropriate Primary Care Physician Utilization	100% of pts see a PCP within 14 days of dx	13%
D. Non-emergent Call Rate	20% reduction in non-emergent calls	100% Decrease <sup>♦</sup>
E. Non-emergent Ambulance Transport Rate	20% reduction in non-emergent ambulance transports	100% Decrease <sup>♦</sup>
F. Readmission Rate	20% reduction in AAMC 30-day readmission rate	41.2% <sup>†</sup>
G. Average Times for Primary Ambulances	10% reduction in “return to service” times for primary ambulances	22.1% <sup>♦</sup>

<sup>†</sup>Measured 6 months prior to enrollment and most recent 6 months

<sup>♦</sup>Patients transported by AAMC non-emergent ambulance because the patient lacked transport removed

<sup>1</sup> <http://www.hospitalmedicine.org/BOOST/>

**Conclusion: EO 2 Had Mixed Results.** In terms of decreasing emergency care usage, the CP program exceeded the goals that were set. 30 day readmissions (EO2f) easily exceeded goals with a 41.2% reduction in readmissions among enrollees. It should be noted, the 30 day readmissions rate is artificially high due to one patient accounting for 16 visits. Without that patient’s data, pre and post enrollment, there is an 83.1% decrease in 30 day readmissions. Overall, as a hospital, AAMC decreased their 30-day readmission rate by 11.73%.

Areas that the CP program did not meet its objectives were the 100% of the patients seeing a PCP within 14 days of diagnosis (EO2c) and reduction in non-emergent calls and transports (EO2d and EO2e).

The poor results from EO2c are due to a lack of transportation for patients. Patients were encouraged to go to the PCP visit, but often cited that they were unable because they did not have transportation. When possible, ACEMS would transport CP patients eligible for the non-emergent transportation benefit through Medicaid, thus impacting the non-emergent ambulance transport results for EO2d and EO2e. However, during the analysis, we took out these CP related transports. For this reason, EO2d and EO2e had a positive result.

While the results of non-emergent transports are negative, it should not take away from the fact that the CP program was able to enroll most every patient into a medical home that the patients visited.

**EO 3: Biopsychosocial Approach.**

Objective	Goals	Results
A. Patient Medical Home Rate	80% of pts have medical home	100%
B. In-Home Health Education Rate	100% of pts receive in-home health education	100%
C. ED Visit Rates	10% reduction in number of potentially avoidable ED visits and costs	58.7%*
D. Rate of COPD Readmissions	Re-admissions for COPD decreased	75%*
E. Rate of A1C Use	A1C for diabetes monitored	BGL was monitored for all diabetic patients, but not A1C

\*Used records from 6 months prior to enrollment and the most recent 6 months

**Conclusion: Overall EO 3 Was An Overall Success.** All metrics were achieved by the CP program with the exception of EO3e, the rate of A1C. The program did not perform A1c at the point of care due to a these point of care tests being redundant to standard processes of care. However, diabetic patients were given glucometers and blood glucose logs to track their progress. In addition, CPs would check diabetic patients’ BGL every visit. Diabetic patients decreased their average BGL by 16.6% during enrollment.

EO3a and EO3b were accomplished in large part because of the embedded training and protocols. In addition, it should be noted for EO3b, CPs would give education and motivation multiple times throughout a patient’s time in the program.

**Evaluation Objective 4: Adherence Promotion.**

Objectives	Goals	Results
Primary Care Encounter Rate	100% of pts have at least one primary care encounter where they receive preventive screenings & interventions	100%
Fall Screening Rate	90% of pts screened for risk of falls	100%
Medication Compliance Rate	Medication utilization/compliance monitored?	100%
Hypertension Monitoring Rate	Blood pressure readings for Hypertension monitored	100%

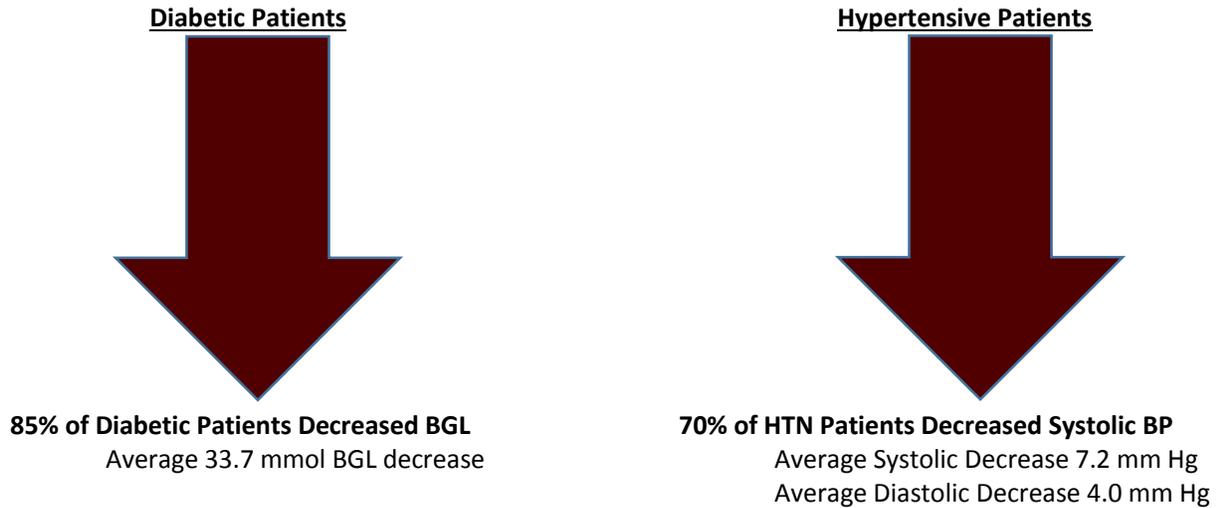
**Conclusion: EO4 Was An Overall Success.** Much of the success of EO4 is attributed to the visit protocols of the CP. The protocols called for CP to encourage, screen, or check patients for compliance at every visit.

**Evaluation Objective 5: Increase EMS Capacity.**

Objective	Goal	Results
A. Employee Satisfaction Rate	Employee satisfaction scores greater than 90%	100%
B. Special Medical Needs Registry Rate	80% of pts are entered into special medical needs registry	None

**Conclusion: EO 5 Had Mixed Success.** Of the two objectives, only EO 5a was achieved. EO 5b was not accomplished because a special medical needs registry was never created. During program implementation, it was decided efforts were better focused on other aspects of the program than the registry. EO 5a does have a caveat to the 100% result. In qualitative interviews, both CPs reported stress due to having to mentally switch from the CP program to an on-duty paramedic during the same 24 hour shift.

Patient Health Outcomes



Among both diabetic and hypertensive patients, we see significant drops in average BGL and average BP. Due to the lack of resources, the CP program did not use any standardized equipment to track metrics of COPD patients aside from patient recall. However, COPD patients did record significantly fewer ED admissions in the past 6 months than before enrollment for shortness of breath episodes\* (91.6% decrease).

\*Shortness of breath episodes as opposed to an empirical measurement was used because the instrument to measure COPD outcomes was a pulse oximeter. Pulse oximeters are considered an unreliable measurement for COPD. However, if pulse oximeter was used to measure the Abbeville CP COPD patients, the difference was statistically insignificant. Many of the COPD patients had pulse oximeter readings of a healthy person, most likely due to adequate treatment..

**Emergency Services Utilization**

**Hospital.** The CP program had success in decreasing ED and IP usage by their CP patients. CP patients decreased ED utilization by 58.7%, and IP utilization by 60.0%

**EMS.** The breakdown of emergency (911) visits for patients in the CP program are as follows:

<b>Before</b>	<b>After</b>
<u>Time with patient before<sup>+</sup></u> 147.8 minutes	<u>Time with patient after<sup>+</sup></u> 110.9 minutes
<b>Decreased by 36.8 Minutes</b>	
<u>Amount of Visits:</u> 33*	<u>Amount of Visits:</u> 17*
<b>48.5% Decrease*</b>	
<b><u>Top Visits</u></b>	
22 Transfers to higher care 11 SOBs 6 Pain 4 Hyperglycemia 3 Chest Pain	15 Transfers to higher care 11 SOBs 5 Abdominal Pain 5 Unconscious 3 Chest Pain

\*Removed outlier

<sup>+</sup>From time on scene to return to service

When three patients who were outliers in the sample were removed, CP patients decreased their use of ACEMS services by 48.5%. However, if all patients were included in the analysis, ACEMS services increased by 28.0%. The higher amount of emergency calls did not result in a higher amount of emergency room visits, most likely due to patients waiving transportation. Unfortunately, it is not clear what caused an uptick in patient use of emergency transport. However, various factors may have caused this increase include, but are not limited to:

- Patient increased awareness of conditions
- Patient increased comfort level around paramedics due to interactions with CPs
- Patient reliance on ambulance transport post enrollment compared to individual transport before enrollment

The stark difference between the analyses was caused by three patients who increased or continued their rate of ACEMS use following enrollment. It is more than likely that the patients may have other underlying problems, which may include other environmental problems not seen by the CP, such as other underlying health or mental health diseases that have not been diagnosed. We suggest increased education for the patients to prevent further use of ACEMS services. In addition, CPs should also have access to (and be trained on implementation of) additional screening tools that would be useful in identifying concurrent issues that may complicate their care.

The amount of time ACEMS spent with each patient during a routine 911 call decreased by 36.8 minutes (25.2% decrease). While the records do not state the reason for shortened time, the data shows two particular differences before CP patients enrolled compared to after.

1. **Patients were less likely to need intensive care.** Patients did not require intensive care, or required higher care through a transfer to a larger hospital. This particular result is evident by a 31.8% decrease in transfers of care to a larger hospital. The results indicate that patients in the program were more likely to have their chronic conditions under control.

2. **Patients were more likely to have a faster visit than before.** The reason for this result is not clearly stated in the record. However, two conclusions can be made. Patients or providers either knew their health status better, or the patient required less behavioral attention than before.

### Cost Related Analyses

**Average Charge Differences.** While charges are not an accurate measure of cost, it does give an idea of the value of treatment given.

<u>Average Charges</u>	
<p><b>BEFORE</b></p> <p><u>Enrollment Into CP Program</u></p> <p><b>\$3,412.88</b></p>	<p><b>AFTER</b></p> <p><u>Enrollment Into CP Program</u></p> <p><b>\$2,533.82</b></p>
<p><b>Average Difference: \$879.06 Reduction/Visit</b></p>	

The difference in a lower average charge is due in large part to CP patients managing their health better. In addition, one result that made a large difference in the average charges was due to patient's coming in with less obscure complaints than before. For instance, diabetic patients present at the ED complaining of "weakness" before, would come in after enrollment with the complaint of "Hyperglycemic" or "Hypoglycemic". This particular caveat in the results speaks volumes to the patient's ability to manage and knowledge to understanding their own health. In addition, it helps AAMC diagnose patients much more efficiently, which allows ED personnel to focus on other duties.

### Cost Benefit Analysis

#### Cost/CP Visit.

Based on a review of records from 2013-2014, the average cost/ CP visit amounts to:

**\$205.78/Visit**

The costs of the program are composed of the following:

- Equipment: \$8,473.20
- Personnel/Time: \$73,127.56
- Travel and Maintenance: \$5,251.55
- Startup Costs: \$4,101.93
- **Total: \$90,954.24**

### Potential Cost Savings

Cost of care data is available for AAMC due to its status as a Critical Access Hospital; their required cost reports categorize costs by department. Using the findings from above (reductions in emergency department visits, inpatient visits, and shorter length of stay) and data from the AAMC cost report, we estimated a cost avoidance of \$97,940.09. This estimate is composed of the following:

- Average cost per inpatient day: \$1,531.01
- Average cost per ER visit: \$449.00

- Annual reduction in inpatient days: 28
- Annual reduction in ER visits: 124

Thus, this program saved **33% more** than it spent.

**Comparing Control Group to CP Patients**

During the course of the evaluation, a control group was established to compare with the CP patients. Here are the results on major metrics of emergency utilization:

<b>Metric</b>	<b>CP Patients</b>	<b>Control Group**</b>
<i>ACEMS Metrics</i>		
% of Transports Before vs. After*	7.9% INCREASE (35 vs. 38)♦	38.94% INCREASE (44 vs.69)
% of Transports Requiring Higher Level of Care After Enrollment	25.9%	50.72%
Time Spent Difference Before vs. After*	25.2% DECREASE	11.6% DECREASE
<i>AAMC Metrics</i>		
% Difference ED Utilization Before vs. After	58.7% DECREASE	4% INCREASE
% Difference IP Utilization Before vs. After	60.0% DECREASE (6 before v 15 after)	500% INCREASE (3 before v 15 after)
Difference in Average ED Charges Before vs. After	-\$879.06	-\$126.30
Difference in Average IP Charges Before vs After	-\$1,249.00	\$19,960.55

\*includes transportations that were requested by the CP, but did not specify if it was an emergency or a non-emergent transport

♦Two patients were removed from the analysis. One patient overused EMS services disproportionately compared to patients in both groups. The second patient was using ACEMS transport services because they lacked a car

\*\* Enrollment period for control group is set to CP patients with similar characteristics enrollment period

Overall, the CP patients had better results than the control group as shown above in every measurable metric. This is particularly important when proving the CP program as a feasible option to help decrease high utilization of the ED by patients.

**30-Day Readmissions**

Below is a comparison of 30-Day Readmissions to AAMC for CP Patients and Control Group Patients.

**30 Day Readmissions For CP Patients**

<b>BEFORE</b>	<b>AFTER</b>
<u>Enrollment Into CP Program</u>	<u>Enrollment Into CP Program</u>
97	57
<b>41.2% Decrease</b>	

**30 Day Readmission By Patient Breakdown**

<b>BEFORE</b>	<b>AFTER</b>
20 Asthma, 10 HTN, 11 DM, 56 Multi-Diagnosis	8 DM, 3 HTN, 46 Multi-Diagnosis
<b><u>Top Diagnosis</u></b>	
18 Musculoskeletal Pain 14 Nausea 11 Vomiting 7 Bronchitis 6 Shortness of Breath	11 Musculoskeletal Pain 9 Bronchitis 7 SOB 4 Hyperglycemia 1 Elevated BP

**30 Day Readmissions For Control Patients**

<b>BEFORE</b>	<b>AFTER</b>
<u>Enrollment Into CP Program</u>	<u>Enrollment Into CP Program</u>
50	78
<b>35.9% Increase</b>	

**Top Diagnosis**

6 Musculoskeletal Pain 6 Elevated BP 4 COPD 4 Chronic Sinusitis 3 Wound Check	16 Musculoskeletal Pain 9 COPD 4 Asthma 3 Headache 3 Allergic Reaction
---	--

## Other Findings of Interest

**Behavior Changes of the Patients.** Behavior changes in patients are an incredibly trying task. However, the CP program has had incredible success in this area. Patients were encouraged by CPs to take on healthy behaviors as part of the patient’s medical plans. During each visit, the CPs would ask check to see if the patient had adopted the prescribed healthy behaviors. Patients would then self-report whether they had followed such healthy behavior regiment o the CPs. The following numbers of patients reported the following behavior changes:

<u>Exercise</u>	<u>Diet</u>	<u>Medication</u>
30/75	32/75	67/75

One of reasons why the patient outcomes of the program were seen was because of the behavioral changes of the patients. Changes to the lifestyle of the patient are incredibly important for the future of the patient.

**Culture.** During our interviews with staff from ACEMS and AAMC, both organizations noted cultural/organizational differences between ACEMS and AAMC. These differences seemed to stem from different organizational approaches to project implementation. While each organization had different reasons and viewpoints on the cultural differences, both organizations believe that relations are improving.

**Outreach.** One of the other issues highlighted during the interviews was problems with recruitment of patients. It was claimed during the interviews that many patients that are recruited into the program typically do not want to join the program.

**Unforeseen Events Affecting the Success of the CP Program.** There were two unforeseen events that occurred that hurt the success of the Abbeville CP Program. They were the resignation of a CP and patients wanting particular CPs to treat them.

**Resignation of A CP.** Originally, the CP program was designed to have 3 CPs on duty working with patients. However, one CP would later resign in Fall 2014. Unfortunately, because a CP requires so much more additional training, a replacement CP was not ready at the time of the CPs resignation. The resignation would hamper the amount of care given to the current patients in the CP program. This is especially important because the resignation also prevented the growth of the CP program and created stress within the program.

**Patients Wanting Particular CPs.** The CP program was planned to have patients treated by different CPs. However, shortly after the CP program began seeing patients, patients began requesting for particular CPs. There were also scenarios where patients would miss or cancel appointments accounting for 5.8% of all scheduled visits. It is speculated patients were missing appointments because they did not like CPs. Therefore, the CP program began assigning CPs to patients. Based on interviews, the assigning of CPs limited the growth of the CP program due to scheduling constraints of the CP program.

## Recommendations

---

At this current time, the CP program is not expected to have any source of funding from outside of the community. While certainly devastating to a startup program, we are certain the program is sustainable. However, for sustainability to occur, the program must reallocate their resources to make the program more efficient. Our following recommendations are based on the assumption that the CP program will not receive grant funding in the future. We have categorized our recommendations into 4 sections: Program Recommendations, Process Recommendations, Personnel Recommendations, and Recommendations Once More Funds Are Available.

### Program Recommendations

**Refocus the program for high emergency department utilization.** The original intention of the program was to recruit HTN, Diabetic, CHF, COPD, and Asthma patients. However, the program ended up recruiting high ED utilizers, which caused several patients to have a diagnosis consisting only of mental illness (PTSD and Depression). Also, the program recruited very few COPD/Asthma patients and even fewer CHF patients. For a program that will be resource starved, the program must be streamlined that allows similar treatment plans for patients enrolled in the program.

We suggest that the CP Program refocus their aims to those patients with high emergency department utilization, in order to maximize the return on investment. This may necessitate a change in disease-specific focus areas (e.g. inclusion of mental illness diagnoses). This may also require additional training of the CP staff as well, in order to adequately focus on the myriad of conditions.

**Transportation For Patients.** During our review of the CP program records, we noticed many patients missing appointments due to lack of transportation. In addition, during interviews with staff of the CP program, this was an issue highlighted as a major weakness of the program. Unfortunately, due to the lack of resources in Abbeville County, there is not any public transportation or non-emergent medical transportation (other than through Medicaid) available for this cohort of participants. Based on ACEMS records, the non-emergent EMS services have been used to transport CP patients for care when applicable, although sparingly. The ACEMS and the county of Abbeville should work together to identify innovative solutions to this issue to improve access to care for those in need of reliable transportation.

**Implementing A Cohesive Recruitment Strategy.** One area that the CP program lagged significantly was the recruitment of patients. During the program, 75 patients were recruited into the program. A significant percentage of patients who were offered enrollment in the program declined to do so. While there are no official figures, our understanding is that approximately 50% of recruited patients rejected participation in the program. Cited reasons from interviews with staff showed that patients had a distrust in the program in the form of a government entity or distrust in the effectiveness of the program. It is also unclear how many patients were not made aware of the program due to limited resources or marketing.

A potential area to improve would be patient acceptance upon offer of enrollment. This may take the form of a successful patient who was previously enrolled in the program advocating for others to enroll, either by community events or a written testimonial. Also, further engagement of providers at the AAMC facility (including physicians, clinical staff, and administrative staff) to encourage their patient education efforts would be useful. This may include discussing the program with patients, distributing literature on enrollment, or notifying the CP Liaison on potential patients for follow-up. Improved clinical engagement and endorsement may be key for improved enrollment.

The CP program has also successfully created multiple connections to different community agencies. For the success of the CP program to continue, these relationships must continue to be fostered. However,

the CP program is missing out on chances to foster relationships with other physicians in the community. A strategy should be implemented to outreach to physicians within the community for additional help with the program, but also patients.

## Process Recommendations

**Scheduling Methodology.** Currently the method of scheduling visits has the CP scheduling visits with patients based on the CPs' schedule. This scheduling method was used because CPs were assigned certain patients and patients were scheduled based on the CPs schedule. There are two problems with this method of scheduling:

1. Patients must fit the CP schedule. Unfortunately, a patient's schedule would not always fit the schedule of the CPs. This caused certain patients not being able to see a CP as often as their medical plan called for.

2. It does not allow for efficient delivery for care. Because patients were scheduled based on the CPs schedule, there would be times where CPs would travel consecutive days to Donalds (the furthest city in the county). In addition, CPs are forced to drive different locations in the county on a daily basis. With the amount of driving done by the CP, it adds significantly more to travel time and workload.

An extreme example of this particular problem was when one CP left the program in the Fall. After the CP left, his patient load was partially filled in by the CP liaison. Unfortunately, the remaining patients that were not assigned were left unassigned and were either deemed inactive or discharged. Scheduling difficulties were cited as the reason for these patients for not being seen.

Instead, we suggest having a dedicated staff member in charge of scheduling to solve both of the problems we have outlined. We recommend the CP liaison or administrator of the program as the individual in charge for scheduling utilizing a block method of scheduling, rather than individual CPs scheduling. A current example would be CP 1 drives to Due West, Calhoun Falls, and Abbeville on Monday. On Tuesday, CP 2 will drive to Due West, Calhoun Falls, and Abbeville. This pattern often occurred because scheduling occurs based on the CPs and patient's schedule. Instead, scheduling should occur by grouping of distinct areas by day. For instance, our suggested method calls for a single staff member to schedule visits. Therefore, all Honea Path patients would be scheduled on Monday morning, all Donalds patients on Monday afternoon, all Abbeville patients on Tuesday, etc. (Figure 5). In addition, patients should be able to call a central number that is answered by the staff member in charge of scheduling, so routes can be planned out beforehand for the most efficient route. In addition, block scheduling may help improve CP planning and allows for slower appointments; for example, telling a patient that the CP will arrive during a certain block of time (10-12pm).

The program also needs to examine how to address continuity of CP care. Many of the enrolled patients stated a preference for having a specific CP to handle their care; continuity has been shown to be more effective in many clinical settings, and should also apply here. However, with the limited resources and CPs at this time, this may be difficult to implement.

**Standardize Note Taking Method, And Utilize A Bullet Point Method.** One concern during our qualitative interviews was the amount of note taking into the electronic patient care reporting system the CPs are required to do. Currently, the note taking method used by the CPs is similar to a home health nurse. Essentially, the notes are written in a paragraph form along with measurements. We suggest that note taking occur in a bullet point method or modified form format. This would reduce the amount of typing and documentation required, ensures all data is collected during each visits, and requires less time to review notes before seeing a patient, rather than searching for information on the patient. By standardizing the process across all CPs, it also allows for a newly assigned CP to a case to quickly understand the patient's current status in the program. Please reference Figure 3 and 4, to see examples of a bullet point note taking method.

**Improved coordination with Partners.** One of the highlighted problems discovered in the interviews was a lack of coordination between representatives from AAMC and ACEMS. This was primarily due to the cultures of the two groups, headlined by differing timelines and priorities for program implementation. A contributor to this was irregular and disrupted communication patterns. This was due in large part to a lack of communication between the two organizations. To address this, we recommend these two groups discuss the program on a regular basis (at least twice per month) to ensure adequate communication can occur, improving understanding of differing cultures and priorities. As the program matures, other partners should be included in this process.

**Non-Progressing patients.** Patients who do not respond to the program (as assessed by continued inappropriate use of health care services, measurable outcomes not improving, or other assessment by CP staff) will require additional intervention in order to succeed. These patients may be faced with transportation issues (discussed above), financial issues that preclude necessary dietary or pharmaceutical changes, or have mental health issues that prevent full engagement in their care plans. CPs should take time to attempt to discover the root causes of a lack of progression, and to link the patient with available resources to address these causes. This further highlights the need for the CP program to be fully engaged with community partners, including medical, clinical, and social service in nature.

**Improved Financial Record Keeping.** With the end of the grant funds that initiated and supported the program, it is vital to the program to improve the financial record keeping of the program. As of Spring 2015, the CP program was considered a division of ACEMS, and purchases were made as part of ACEMS.

However, if the program is to succeed and show financial viability, it must have its own budgetary (revenue and expenses) line. This is important for three particular reasons:

1. ***It gives the program the ability to make better financial decisions.*** The goal of the program is to reach financial stability. Being able to specifically track time, expenses, and revenues associated with the program are vital to demonstrate its viability as a service line. It will also allow for the program to make specific budgetary requests to potential funding agencies, such as hospitals, providers, or governmental agencies.
2. ***Demonstrate value to outside partners.***
3. ***It gives the program legitimacy.*** The CP program has shown that it is a success from the prospective of patient outcomes. However, aside from our estimates, the program has yet to show itself to be financially a success. Our cost-benefit analysis was determined by conservative estimates of personnel and equipment costs. For communities who are attempting to replicate the success of the Abbeville CP program, it would help the communities to understand how the Abbeville CP program allocated their money based on financial statements.

**EMS monitoring.** A potential concern with the use of CPs is that EMS operations would be impacted in a negative way. In this program, EMS senior management staff were utilized as CPs to ensure maximum effectiveness. In order to ensure no reduction in the quality of EMS response occurs due to their dual role and since ACEMS is a small system, the ACEMS and CP program need to track specific EMS quality metrics, such as those proposed by the Emergency Medical Services Performance Measures Project<sup>2</sup>. While the CPs

---

<sup>2</sup> <https://www.nasemso.org/Projects/PerformanceMeasures/>

have tracked certain outcomes such as cardiac arrest, the CP program should increase their quality measurement to ensure the CP program does not compromise operational quality.

### Personnel Recommendations

**Additional Training.** A characteristic highlighted by multiple ACEMS staff in interviews was the significant role change a CP must undertake when transitioning from a paramedic to a CP. The CP is a caretaker while a paramedic is a stabilizer. The CPs and staff have already taken opportunities to get behavioral motivational interviewing to improve their abilities as CPs. We strongly suggest and approve that CPs continually receive more motivational training to increase their impact in the field. Because the role of a CP is so radically different from the role of a paramedic, CPs should continually receive training in motivational interviewing, care coordination and continuity, patient education, clinical patient care, and administrative efficiency.

**Mental Health Training.** The unique relationship that the CPs have with patients may allow for discoveries of underlying mental health illness a patient may have. As reported by the Centers for Disease Control, 50% of Americans will develop a mental health disease during their lifetime<sup>1</sup>. More importantly, mental illness is linked with higher incidence rates of chronic disease<sup>3</sup>. More than likely, the CPs will not only have to work to help the patient with their physical health, but also their mental health. We strongly suggest mental health training is required as part of the CP training curriculum because the prevalence of mental health is so high in the U.S. Having CPs become more aware of a patient's mental health can also lead to better healthcare delivery by the CPs.

### Recommendations For Program Expansion (Future Grant Funding)

**Dedicated CP Electronic System For Record Keeping.** The CP program currently utilizes an EMS reporting system for keeping records on CP patients. However, the program is not sufficient for the CP program. During the course of the evaluation, an electronic system was debated as a feasible future option once funding was received. However, without funding, the electronic system was dropped as a future option. We suggest once funding is available once again, a dedicated electronic system for CPs to use in the field in real time is a must for the program. Alternatively, other CP programs have utilized an integration with the local hospital electronic medical record system, with CPs entering notes into a patient's chart directly. This would require either form development or an interface to be developed. This integration would have the added benefit of operational efficiencies, particularly patient history and tracking.

**More CPs Trained.** One way to alleviate stress in the system is to train additional CPs, particularly those that are not senior staff. By training more CPs, CPs would be able to split workloads into a much more manageable amount for each CP. This would also reduce the CP responsibility of senior EMS staff, allowing for a more concentrated focus on CP activities.

---

<sup>3</sup> Centers of Disease and Control (n.d.). Mental Illness Surveillance Among U.S. Adults. Centers of Disease and Control. Retrieved on August 18, 2015 from [http://www.cdc.gov/mentalhealthsurveillance/documents/MentalIllnessSurveillance\\_FactSheet.pdf](http://www.cdc.gov/mentalhealthsurveillance/documents/MentalIllnessSurveillance_FactSheet.pdf)

## Appendix

Figure 1. First Time Visit Information Only

DOB	Primary Care Provider	Primary Diagnosis	Secondary Diagnosis	Medication List	Gender	HOP	Home Health Assessment Done	BOOST Screening	Falls Assessment Done	Referral
1/30/1950	Scott	HTN	DM, Obese	Metformin HCL 1000MG, Citalopram HBR 20 MG, Lisinopril 10 MG, Cyclobenzaprine 5 MG, Aspirin 81 MG, Glimepiride 2 MG	M	Y	Y-21	Y	Y	Welvista
2/28/1977	Oxedine	DM	HTN, RA	Pravastin 40 MG, Metformin 1000 MG, Glipizide 10 MG,	F	N	Y-18	Y	Y	Medicaid

Abbeville Community Paramedicine Evaluation Report

Figure 2: Information Collected On Visits.

Date	Body Weight	BP	Pulse	Respiratory Rate	Pulse Oximetry	Blood Glucose	Same Prescribed Medications?	What Changes?	Blood Sugar, Diet, Medication Compliance and or logs Done?	If Yes, Specify	Seen Primary Doctor Since Last Visit?	COPD, Diabetes, CHF, Exercise, Diet, Smoking, Hypertension, Medication Education Done?	If Yes, Specify	CP Name	Comments	To ER Room?	Referred To A Program
1/28/2014	200	140/90	90	14	99	130	Y		Y	BP log, medication, diet	Scott	Y	Diet	Livingston	Complains of abdominal pain, asked if she wanted to go to ER, but declined	N	Medicaid
2/14/2014	199	140/90	84	15	98	128	N	Augmentin added	Y	BP log, medication, diet	Oxedine	N		Livingston	Suddenly fainted during visit	Y	

Figure 3: Ideal Bullet Point Taking Method

Narrative

(Explanations are in blue)

- Compliance: (Compliance of anything the patient did, or anything they did not comply with. If they are non-compliant with a portion of their treatment plan write "N-" in front of the behavior they are complying with)
- Education: (Any education you gave)
- Any Healthcare visits since last CP encounter (If they did not see a PCP since last CP visit, just write No Healthcare since last CP visit. OR if they had an emergency visit)
- Referred to: (showed that they were referred anything. For example, to UCMAC. If they are applying for Medicaid or Welvista please note as well. )
- Any additional information

Figure 4: Example of Ideal Bullet Point Taking Method

Narrative

(Explanations are in blue)

- Compliance: BP log, Medication, Diet, Diet log. N-Exercise, N-BG Log (This shows that they are compliant with BP log, Medication, Diet, Diet log, but noncompliant with exercise and BG log)
- Education: Diet, BGL (You gave diet and BGL education)
- Saw Dr. Scott 07/10/15; Visited ED 07/11/2015 for SOB (If they did not see a PCP since last CP visit, just write No PCP since last CP visit.)
- Referred to: UCMAC, Welvista (showed that they were referred to UCMAC and Welvista. )
- Patient has shown non compliance with the treatment plan
- Patient has reported episode of SOB

Figure 5: Ideal Scheduling Method

Time	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
0700	Donald Patients	Pt 1	Abbeville Patients	Pt 7	Calhoun Falls Patients	Pt 11	Abbeville Patients	Pt 16	Honea Path Patients	Pt 21	Abbeville Patients	Pt 26	Any Patient	
0900		Pt 2		Pt 8				Pt 17		Pt 22				
1000		Pt 3				Pt 12				Pt 27				
1100				Pt 9		Pt 13		Pt 18	Calhoun Falls Patients	Pt 23				
1200								Pt 19		Pt 24		Pt 28		
1300								Pt 14				Pt 29		
1400	Due West Patients	Pt 4		Due West Patients		Pt 20	Pt 25	Pt 30						
1500		Pt 5	Pt 10											
1600		Pt 6												
1700														
1800														
1900														

Smaller cities with patients requiring less intensive care should be scheduled on Sundays or have one dedicated block/week. Scheduling blocks for cities should be moved on a week to week basis. For instance, the following week, Abbeville patients should have blocks open on Monday and Wednesday.