



Western Eagle County Ambulance District
Evaluation of the Community Paramedic Program
September 2010 – June 2012

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INTRODUCTION

The field of community paramedicine (CP) is widely gaining momentum as an efficient and effective means of addressing health care gaps in local communities. The model uses specially trained paramedics to: 1) provide primary care services within their scope of practice, in a patient's home, and under a physician's order; and 2) to provide community-based services in partnership with local public health and human service agencies.

The Western Eagle County Health Service District (WECAD) started its community paramedic program in order to be more proactive in helping medically vulnerable residents, (e.g., the chronically ill, the elderly, and those with a recent hospital stay), maintain their health, while reducing health care costs. Like other EMS agencies, WECAD's ambulances were regularly responding to patients with complications that could have been avoided, and to calls that while medical in nature, were not true emergencies. These experiences prompted WECAD to explore ways that its paramedics could be more proactive in promoting health and preventing unnecessary ambulance transports.

Although several community paramedic programs operate internationally, WECAD has been a pioneer of the model in the U.S., and was the first community paramedic program in Colorado. WECAD serves a rural resort area with approximately 54,000 residents located in the Rocky Mountains, two hours west of Denver, near Vail. The community aspect of the program utilizes paramedics to assist the county's Health & Human Service agency with services such as immunizations, senior fall prevention, blood draws at health fairs, mass vaccination clinics, adult and child protection visits, and early childhood home visits with new parents. The Department's medical director, a local physician, oversees these services and the paramedics work along side a nurse, health educator or caseworker. This assistance helps expand the capacity of the agency.

The physician-referred services provided in the home, utilize a specially trained and supervised paramedic working under a physician's order, to perform medical procedures already in their skill set. Such procedures include physical assessment, vital signs, blood pressure screening, cardiac monitoring, blood glucose testing, chronic disease management (e.g., asthma, COPD, diabetes), medication reconciliation, vaccinations, and wound care. Community paramedics are also trained in home safety assessment, and how to refer to social service agencies. In essence, these services extend the reach of the physician and are especially useful for patients not likely to make or keep a doctor's appointment or for patients that could benefit from monitoring between doctor visits. The in-home care aspect is not of

an ongoing nature, such as that of a home health agency, but instead, a mechanism to help physicians keep tabs on patients going through a medically vulnerable period.

Emerging studies from around the globe indicate that CP programs reduce the prevalence of acute health issues, ambulance transports, emergency department utilization, and hospital readmissions.^{1,2,3} The Joint Committee on Rural Emergency Care (JCREC), recently called the community paramedic model “One of the most progressive and historically-based evolutions available to community-based health care,” and further praised its potential to “decrease emergency department utilization, save healthcare dollars, and improve patient outcomes.”⁴

Evaluation Time Period

The Western Eagle County Health Service District employed an evaluation aspect to its program from inception. The program began operating in September 2010. In working with state regulators, WECAD temporarily suspended the physician-referral aspect in November 2010, to apply for a home health license. It did provide community-based services during this time period. The program resumed with physician-referral services again in June 2011. This evaluation covers patients seen through June 2012. The three time periods of evaluation are illustrated below.





COMMUNITY-BASED SERVICES PROFILE

WECAD and the Eagle County Health & Human Services have been experimenting with various roles and services of the community paramedic. During the evaluation time period, WECAD's community paramedic program worked with HHS, including the county's public health agency to provide the following:

- An eight-week fall prevention class taught at the senior center
- Attendance at senior lunches to discuss health issues
- Assistance at public health flu shot clinics and the vaccination of 300-350 clients
- Coordination of and participation in the blood draw portion of the 9HealthFair in 2011
- Welfare checks of Health & Human Service clients, including children and adults
- Bright Beginnings early childhood home visits for new parents
- Post-partum home visits

During the next evaluation period, the type of services, number of clients served and client demographics will be tracked.

PHYSICIAN REFERRED IN-HOME PATIENT PROFILE

WECAD worked in partnership with 3 local physician practices and 1 hospital, and received referrals from 11 physicians during the time period listed previously. For the purposes of this evaluation, patient information was tracked through an electronic medical record system (EMR) called High Plains, which is operated by WECAD for all ambulance and community paramedic clients. Demographics and referral diagnoses were taken from the physician order form and entered into the EMR by the paramedic. The EMR was queried for this report to provide descriptive statistics about the patient population. This information was then cross-referenced with individual chart reviews of every patient.

Patient Population

Overview

The following is an overview of the patient population served during the evaluation time frame, including demographics, diagnoses and services.

- *Total Number of Patients Served:* 36
- *Total Number of Visits:* 97
- *Number of Visits per Patient:* The average patient was seen between 1 and 5 times. There was one outlier, seen 37 times as an alternative to a skilled nursing facility.

Demographics

- *Age:* The median client age was 65; four patients were under age 10
- *Gender:* 39% were male and 64% were female
- *City/Town of Residence:* 40% Gypsum, 32% Eagle, 21% Avon, 3% Edwards, Minturn 3%

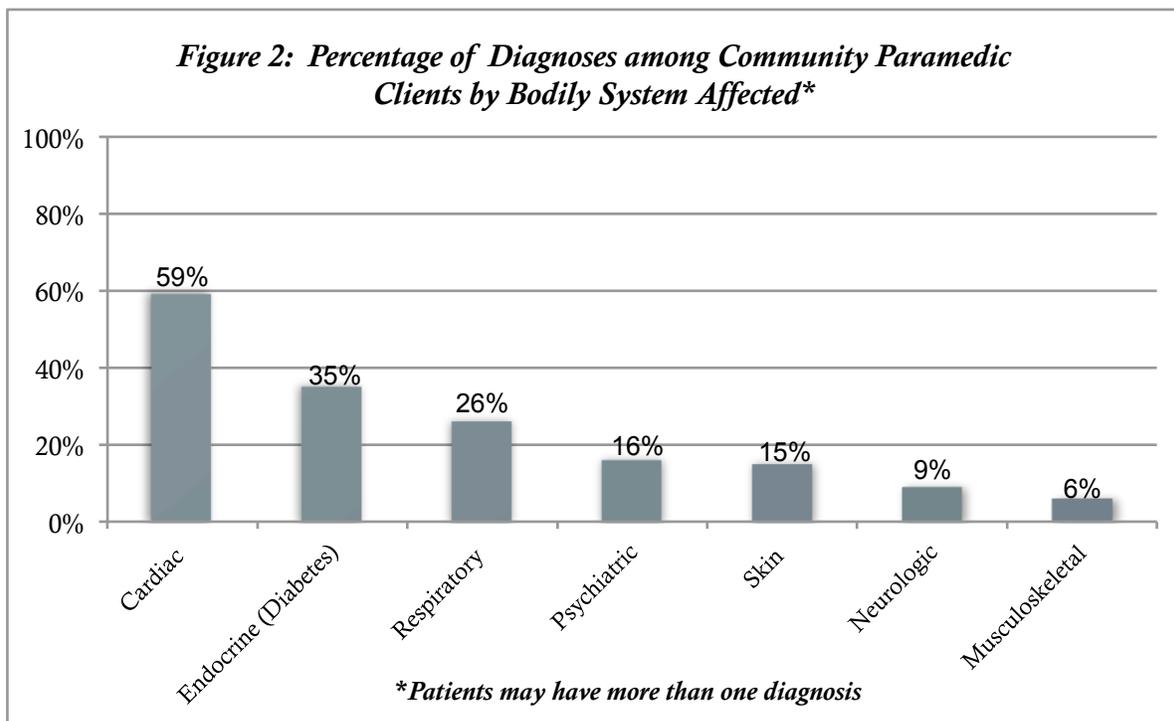
Diagnosis at Time of Referral

Figure 1 illustrates the types of diagnosis listed on the physician order form, when the patient was referred to the Community Paramedic Program. Patients may have had more than one diagnosis. These diagnoses are categorized by bodily system, based on the Bates Guide to History Taking and Physical Examination.

Figure 1: Community Paramedic Patient Diagnosis on Physician Order, by Bodily System

BODILY SYSTEM	PATIENT DIAGNOSIS
Cardiac	Coronary artery disease, congestive heart failure, history of heart problems, myocardial infarction, hypertension, edema
Respiratory	Asthma, COPD, emphysema, respiratory inefficiency, hypoxia/hypoxemia
Psychiatric	Anxiety, hallucinations, substance abuse, depression, bipolar
Neurologic	Mental confusion, cerebrovascular disease, seizure disorder, developmental Delay
Endocrine	Diabetes
Skin	Cellulitis, wound(s)

Figure 2 uses the Bates’s categories and provides a percentage of diagnoses for each bodily system, based on the total number of patients (N=36). Note that patients could have more than one diagnosis. Fifty-nine percent (59%) of patients had cardiac issues, which was the most frequent diagnosis, followed by the endocrine system at 35 percent, which included primarily diabetes patients. Over one quarter of patients (26 percent) had respiratory problems.



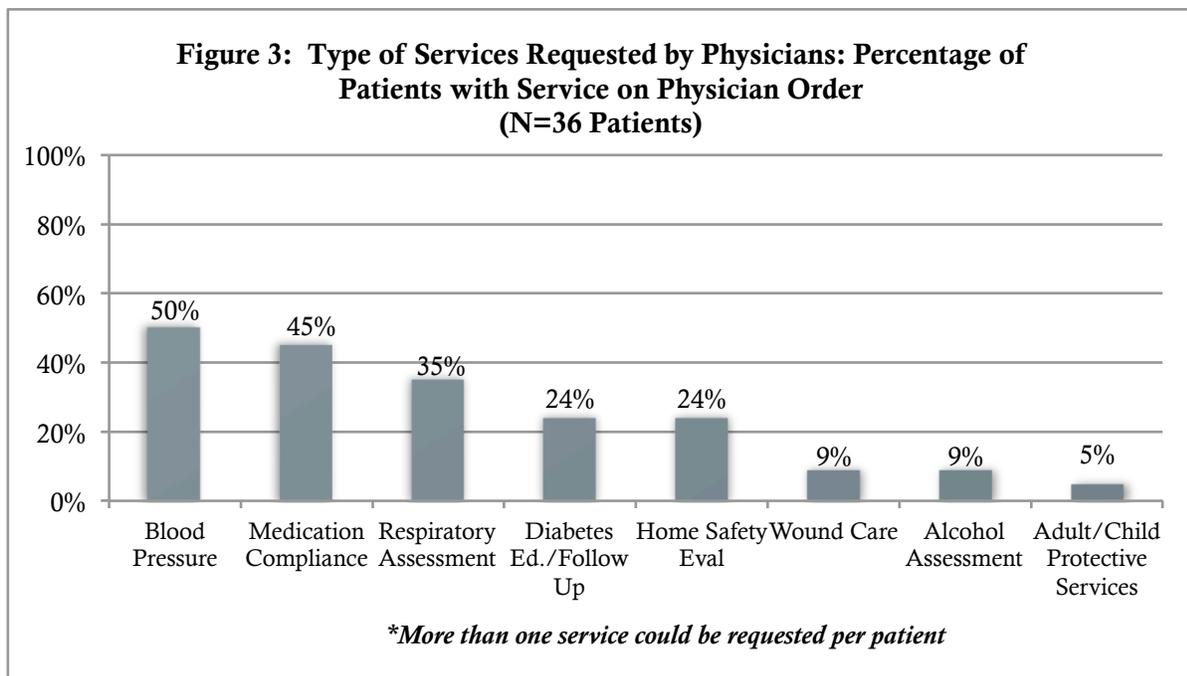
Co-Morbidities and Risk Factors

One hundred percent of physician-referred patients to the Community Paramedic Program can be characterized as medically vulnerable due to co-morbidities and risk factors:

- 68 percent had co-morbidities, meaning more than one major health issue (Examples: diabetes and asthma; obesity and alcohol abuse).
- 53 percent were over age 65 and had underlying health conditions.
- 18 percent had a psychiatric issue, in addition to other medical needs.
- 9 percent had a congenital disorder (birth defect), which made them vulnerable to other health issues.
- 9 percent were recently discharged from the hospital and had an unrelated, underlying medical condition or risk factor (such as hypertension or being elderly).

Services Ordered

Figure 3 provides an overview of the services requested by the physician. Note that physician’s may have ordered more than one service per patient. A blood pressure check was the service most frequently ordered (50%), followed by medication compliance (45%) and respiratory assessment (35%), including the oxygen saturation level.



PROGRAM COST/BENEFIT ANALYSIS

An important aspect of this evaluation is the cost/benefit analysis of WECAD's Community Paramedic Program. This section seeks to estimate the program's medical cost savings. To calculate these savings, we estimated the units of services prevented by the community paramedic visits, compiled publicly available cost data on healthcare services, and calculated a total cost for the community paramedic services assuming a full case load. The methodologies used are further explained below.

Estimated Units of Prevented Services

One purpose of the community paramedic program is to prevent a higher level of service utilization by monitoring vulnerable patients and intervening before their condition deteriorates. To assess whether this had occurred, criteria were developed for each service level higher than a community paramedic visit, including physician office visit, emergency transport, emergency department admission, and skilled nursing care. These criteria were then applied to chart reviews of all community paramedic patients. The scenarios under which it was concluded that prevention of a higher level of service had most likely occurred are provided below.

Definitions

Prevention of a Physician Office Visit

The community paramedic visited the patient's home in lieu of the patient going to the physician's office. The patient's condition was managed in the home and a referral for additional physician care did not need to occur.

Prevention of an Ambulance Transport

1. A community paramedic monitoring a patient found their condition to be deteriorating because they weren't taking their medications correctly. Without the CP intervention they would have likely required an ambulance transport within 24-48 hours. The lack of medication compliance resulted from either the patient not understanding how to take their medication correctly or not taking the medication at all because they didn't think they needed it. The community paramedic was able to stabilize the condition, educate the patient and institute a method to help the patient manage their medications.

2. A community paramedic monitoring a patient found their condition to be deteriorating and not able to be stabilized in the home. While the condition was likely to necessitate an ambulance transport within another 24-48 hours, at this point, the patient could be driven to the physician's office, the urgent care facility, or the emergency department by a caregiver.

3. The patient was a frequent ambulance user prior to being referred to the community paramedic program. In a retrospective case study, the number of times the patient called 911 and was transported six months prior to beginning the program was compared to the number of transports after community paramedics began to intervene.

Prevention of a Hospital Admission/Readmission

In one case, the community paramedic referred a deteriorating elderly patient that had been recently discharged to hospice care instead of being re-admitted to the hospital.

Prevention of Stay at a Skilled Nursing Facility

In one case, the patient needed skilled nursing but the community paramedic provided the medical care in the home instead. The community paramedic conducted a home visit 1-2 times per week for 8 months.

Estimated Costs of Services Prevented

In order to calculate the cost savings of the Community Paramedic Program, it was necessary to calculate the cost of the units of services prevented. For the prevented hospital visits, we used local hospital data for the average cost per inpatient admission.⁵ For the skilled nursing facility days, we used local data for the cost per day for skilled nursing stays.⁶ For the cost of a physician visit and the cost of an ED visit, we used national data because we could not obtain local data⁷. For the cost of an ambulance transport, we also used national data.⁸ The prevented visits were multiplied by the cost per visits to calculate prevented cost. The calculation of the estimated costs of services prevented is provided in Figure 4.

Figure 4. Estimated Cost Savings by Type of Service

Type of Visit	# Visits Prevented	Total Cost per Visit	Dollar Amount Saved
Physician Office	47	\$199	\$9,353
Ambulance Transport	15	\$415	\$6,225
ER Visits	13	\$922	\$11,986
Skilled Nursing	244	\$394	\$96,136
Hospital	3	\$3,977	\$11,931
Totals	351		\$135,631

Estimated Costs of Community Paramedic Services

For the purposes of this cost savings estimation, the community paramedic’s full wage and benefit was utilized, which is about \$100,000. In calculating the cost per visit, a per-visit time of 1.5 hours was used, along with the hourly cost of a community paramedic. The calculation assumed a full time caseload, even though WECAD’s program hasn’t yet reached this level. We thought this would be important in order to model the cost savings and show the potential cost/benefit.

In addition to the wage and benefit expenses of the community paramedic, an overhead cost was calculated at 50 percent of the community paramedic, to represent support services such as a program manager, scheduler, training and supply costs. Travel costs were calculated per visit using the IRS mileage rate of 55 cents per mile and assuming an average round trip of 20 miles. This cost was summed to calculate a cost per visit of \$119.17. Thus, with 97 visits over the program period, the total cost of the community paramedic visits was \$11,560 (Figure 5).

Figure 5: Calculated Costs of the Community Paramedic Program during the Evaluation Time Period

	CP Visits	CP Labor Cost per Visit	Overhead Cost per Visit	Travel Cost per Visit	Total Cost per Visit	Total Cost Incurred
Community Paramedic	97	\$72.12	\$36.06	\$11.00	\$119.17	\$11,560

Estimated Cost Savings

The overall health care cost savings for the program during the evaluation time period is estimated to be \$124,071. This is calculated by taking the estimated \$135,631 in health care savings due to the prevention of care at a higher level of service, less the cost incurred for the community paramedic program of \$11,560, for the total of \$124,071.

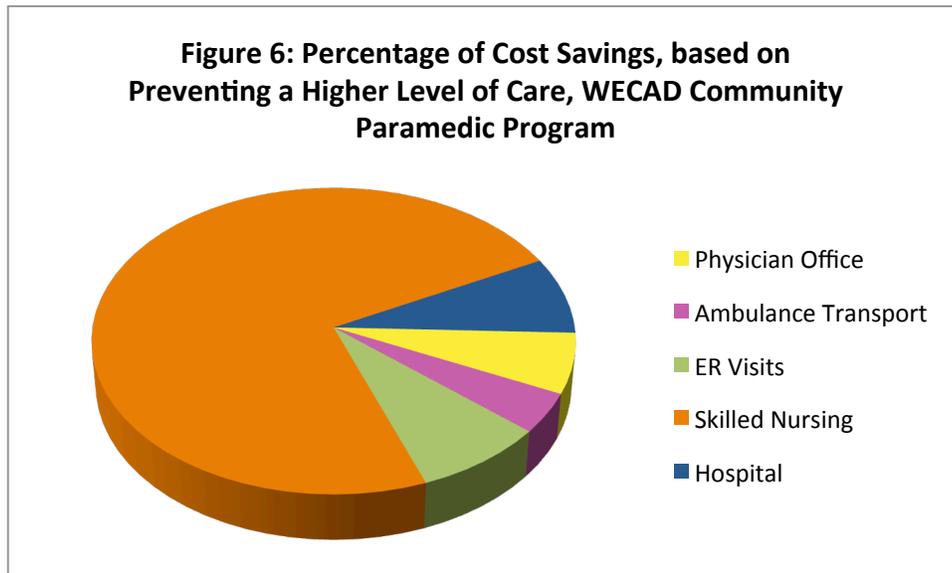


CASE STUDIES: MODELS FOR THE FUTURE

In the section below, case studies from WECAD’s community paramedic program are highlighted to show the most promising areas for healthcare cost savings. These are based on actual services provided and reflect excellent care outcomes and substantial cost of care reductions.

Chronic Patients in the Skilled Nursing Facility

As illustrated in Figure 6, the community paramedic programs largest cost savings came from an individual with multiple chronic health conditions that was kept out of a Skilled Nursing Facility by the community paramedic program.



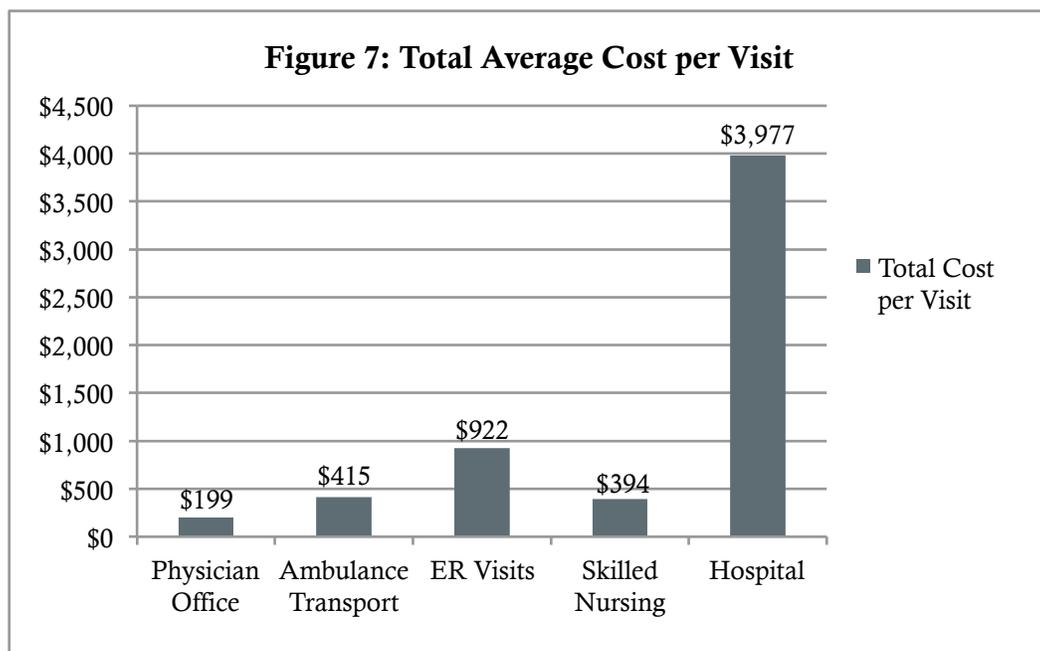
By coordinating with a primary care physician on a plan of care and implementing periodic visits, a community paramedic was able to manage the care in the patient’s home. This not only substantially reduced the cost of the patient’s care by keeping the patient out of a nursing facility which costs roughly between \$200 and \$400 per patient day for average acuity cases, but also allowed the patient to remain at home. Also, providing community paramedic services to this patient reduced the 911 calls and emergency department visits from multiple visits in the months before the community paramedic treatment program to none after implementing the community paramedic care.

A promising avenue for a community paramedic program is to target chronically ill patients who can be managed at home with a community paramedic providing periodic visits to monitor and provide services within their scope. This will require a high level of coordination with the patient’s medical home in order to establish a plan of care.

Preventing Readmissions

Another promising area of focus for community paramedic programs is reducing preventable readmissions. WECAD’s Community Paramedic Program worked with physicians to provide follow-up care to a certain set of patients within a pre-defined timeline after discharge from an acute care facility. The patients seen had been admitted for hypertension or cardiac problems. Several of these patients were identified as having complications or worsening health conditions several days after discharge. The community paramedics were able to refer the individuals to a physician’s office before the patient’s condition required an emergency room visit and an admission to an acute care facility.

The high cost of acute care visits is shown in Figure 7, which highlights the large potential of healthcare savings by reducing hospital readmissions by using a community paramedic for post-discharge services.



OTHER OPPORTUNITIES FOR COMMUNITY PARAMEDIC PROGRAMS

In addition to the case studies presented there other areas of potential opportunity for community paramedic programs to fill health care gaps, reduce the cost of healthcare, and provide better health outcomes.

Targeting Frequent Users

Hot-spotting frequent emergency department patients and ambulance users, sometimes referred to as “frequent flyers,” may reduce a significant resource burden in the realm of emergency medicine. A community paramedic program can identify, assess, and intervene with this patient population, so these entities are providing less non-emergent care.

Care Coordination

Improving patient-provider communication is an area of focus for the Centers for Medicaid and Medicare Services, in numerous demonstration and payment reform programs. A community paramedic can fill the role of coordinating care between a patient transitioning from an acute care facility to home or for patients with multiple care providers who don't understand their care plans. An example of this from WECAD's program has been medicine reconciliation where the paramedic determines the patient's understanding of the physician's instructions and level of compliance and intervenes accordingly.

Preventing Hospital Readmissions

Within 24-48 hours after discharge from an acute care or long term care facility, the community paramedic can see patients to assess compliance with the discharge plan, medication reconciliation, pain management, and assuring proper follow-up with the primary care physician. These visits can help reduce hospital readmissions.

Medical Screening for Mental Health Admissions

The community paramedic can work with local mental health systems to provide medical screening and assessment prior to admission into a mental health facility. Currently patients are taken to the emergency department for blood work and a physical exam to clear them to be admitted. The cost of these services could be prevented if the paramedic were to go to the mental health clinic to meet the needs of the patient.

High-Risk Patient Care

The physician can use the community paramedic to target high-risk patients for follow up, such as pediatrics, those with co-morbidities, or patients with a chronic illness. The visit can help monitor the patient's condition, plus assist with a variety of medical care in the home, between doctor visits. This may decrease the chance of an emergency department visit or unnecessary clinic visit.

Pre-Surgical Home Safety Inspections

Community paramedics can conduct home safety inspections in a patient's home prior to a scheduled orthopedic surgery to ensure mobility with proper assistive devices. This would assist physicians in being able to discharge patients in a timely manner as numerous orthopedic surgery patients have to be held in the hospital when the patient realizes they will be unable to return home because of accessibility issues (e.g. stairs or obstacles that are difficult to maneuver around).

CHALLENGES FOR COMMUNITY PARAMEDIC PROGRAMS

Despite the growing opportunities for community paramedic programs through CMS and other payor initiatives, a number of challenges remain to be addressed. These challenges are primarily regulatory but also include coordination with other care providers.

Regulatory:

1. Physician Referrals – The requirement to obtain a physician referral for each community paramedic causes enormous resource burdens on physicians who are required to reauthorize before every visit. It would be easier to obtain one order for multiple visits.
2. Reimbursement of Services – The current payment system does not reimburse for paramedic interventions outside of ambulance transports. As the current reimbursement systems are moving away from fee for service, a reasonable way to reimburse community paramedic services needs to be determined using global, bundled, medical home or other payment models.

Coordination:

1. Coordinating with other Home Health providers
2. Finding medical homes for patients
3. Communication with primary care physicians
4. Local hospitals buying in and establishing the referral process
5. Lack of patient and client referrals

Communication:

1. Provider Education and Feedback – The provider community needs to be better informed on services available through the community paramedic program, the outcomes of the treatments of the provider's patients as well as feedback of the overall effectiveness of the community paramedic services. Some providers also responded that they did not have the required administrative resources to properly work with the community paramedic program.
2. Patient Education – Most patients are unaware of the community paramedic program and how it could be used to help them. They are also confused about whether they need a physician referral or if they can directly contact the program or if they need to ask the physician for the community paramedic services.

Education:

1. EMS provider shifting practice focus from treating a specific incident to treating every aspect of the patient's health
2. Coordination of clinical sites in non-traditional EMS clinical locations

Evaluation:

In order to perform an evaluation, the program must have a standard way to collect and manage data of each patient. The electronic medical record system, developed for emergency services use, may not easily lend itself to collecting community paramedic program data. In the case of WECAD, chart audits supplemented the EMR system. However, in a program with a large client base that is quantifying the demographics and services of every patient, chart audits will not be feasible.

END NOTES

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⁷ Medical Expenditure Panel Survey Statistical Brief #318. (2008)

⁸ US Government Accountability Office, *Ambulance Providers: Costs and Medicare Margins Vary Greatly* (GAO-07-383). (2007)