California Health Care Foundation

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Issue Brief

Community Paramedics Team Up with Hospitals to Reduce Readmissions

A growing national movement toward better and expanded use of paramedics to address community needs is taking root in California. Pilot projects across the state are testing whether the emerging field of community paramedicine (CP) can play a role in improving population health, reducing costs, and improving the patient's experience with health care.

This issue brief describes CP pilot projects in five California communities that provide patients who have been recently discharged from hospitals with timely follow-up visits, calls, or both. The purpose of this follow-up is to ensure that patients continue to improve after their hospitalization, understand and follow their discharge instructions, and obtain the health care resources and services needed or ordered.

These services are being provided as part of pilot projects because California currently only allows paramedics to practice in a hospital as part of their training or continuing education, while at the scene of a medical emergency or during transport, during interfacility transfer, or while working in a small and rural hospital.[1]

In the cities of Alameda and Glendale, and in the counties of Butte, San Bernardino, and Solano, community paramedics make an in-person visit, phone call, or both to eligible patients between 24 and 72 hours after hospital discharge. The community paramedics visit or call patients who have one or more of the following six conditions:

- Heart failure
- Acute myocardial infarction (commonly known as a heart attack)
- Chronic obstructive pulmonary disease (COPD)
- Pneumonia
- Sepsis
- Diabetes

Community paramedics conduct a medical assessment to identify problems requiring attention by a physician or other care team member before the patient's next scheduled appointment. For example, the patient may need a change in a prescription or home health care. During an in-person visit, the community paramedics also determine whether the

patient needs an additional in-person visit and ensure that the patient's environment is safe (e.g., smoke detectors and lights function, no slip hazards exist).

The primary goal of the pilot projects is to reduce the number of patients readmitted to the hospital within 30 days, and correspondingly, to reduce the financial penalties that Medicare levies on hospitals for these readmissions.[2] Additional goals include:

- Improving the quality of care provided to patients by ensuring that their follow-up and next steps are clear and that fragile, vulnerable patients receive additional support.
- Reducing the number of patients who have an emergency department (ED) visit within 30 days.
- Achieving overall savings for the health care system.

As of September 2016, 922 people agreed to follow-up care by a community paramedic after discharge from the hospital (see Table 1).[3] In four pilot sites, community paramedics made one or more in-person visits to patients. In Butte County, which has a comparatively low population density and more limited availability of community paramedics, the primary mode of contact is phone calls, with about 10% of patients receiving an in-person visit based on the community paramedic's assessment of their need for additional assistance.

Table 1. Post-Discharge Patients Served by Community Paramedics, by Site*

LEAD AGENCY†	NUMBER OF PATIENTS	PATIENTS RECEIVING AT LEAST ONE CALL OR VISIT FROM A COMMUNITY PARAMEDIC	
		NUMBER	PERCENTAGE
Alameda County EMS Agency	64	62	97%
Butte County EMS	500	491	98%
Medic Ambulance Solano	71	68	96%
San Bernardino County Fire Department	133	71	53%
UCLA Center for Prehospital Care (Glendale)	154	107	69%
Total	**922**	**799**	**87%**

*Number of patients served through September 30, 2016, per data submitted for an independent evaluation of the CP pilot projects.
†Each of the five sites partnered with one local hospital.

Source: UCSF, *Evaluation of California's Community Paramedicine Pilot Program* (January 2017).

What Is Community Paramedicine?

Community paramedicine is a locally designed, community-based, collaborative model of care that leverages the skills of paramedics and emergency medical services (EMS) systems to address specific local problems and to take advantage of locally developed linkages and collaborations between and among EMS and other health care and social service providers.

Community paramedics receive specialized training in addition to general paramedicine training and work within a designated CP program under local medical control as part of a community-based team of health and social services providers.

Source: Kenneth W. Kizer, Karen Shore, and Aimee Moulin, *Community Paramedicine: A Promising Model for Integrating Emergency and Primary Care*, July 2013, California Health Care Foundation, www.chcf.org.

To learn more about community paramedicine, watch the animated video at www.chcf.org/community-paramedicine-briefing.

Overview

Hospital readmissions within 30 days of discharge are costly to the health care system — an estimated $41.3 billion nationally in 2011.[4] The national focus on reducing hospital readmissions to avoid Medicare penalties and the success of CP programs in other states set the stage to test this post-discharge CP intervention in California. Emergency medical services (EMS) providers across the state saw an opportunity to meaningfully address community needs by partnering with hospitals to improve care and achieve system savings.

The five post-discharge pilot sites are in diverse counties and communities, with wide variation in the types of patients served. For example, three sites identified methamphetamine use as a significant problem in their counties, with many patients in their 30s and 40s having heart failure, a condition that is much more common in older adults. Other sites serve primarily older patients with multiple chronic conditions. The number of community paramedics and the staffing models used also vary.

"The community paramedic program provides an additional layer of support for our patients. It improves patient health for better outcomes, while at the same time reducing cost to the hospital."

— Kathy Cawthon, RN, MSN, Manager, Quality Management, Enloe Medical Center

Project Design

Prior to considering changes in licensing laws, California's Office of Statewide Health Planning and Development requires an application and review process for pilot projects designed to test and evaluate new or expanded roles for health care professionals. The pilot project application for CP, submitted by the state's Emergency Medical Services Authority (EMSA), was approved in November 2014, paving the way for pilot projects across the state. The major steps involved in the design of each site's project were:

- Identification of key partners including EMS agencies, fire departments, hospitals, and ambulance providers
- Needs assessment with key partners to identify areas that could be addressed by CP
- Development of protocols and policies
- Community paramedic selection and training/ curriculum development
- Review of human subject safety by an institutional review board (IRB)
- Identification of data elements to track

The project sites made the CP training opportunity available to their paramedics who met EMSA's criteria:

- Commitment to an additional 200+ hour training program[5]
- Four years of experience as a California licensed paramedic
- Current local EMS agency accreditation in good standing
- No clinical deficiencies or disciplinary actions in the past 12 months

Paramedics participating in the CP pilots across the state completed a 152-hour core training curriculum. Community paramedics in the five post-discharge sites completed an additional 50 to 180 hours of site-specific training on treatment of the condition(s) of focus and local policies and procedures, as well as personal instruction with physicians in the hospital.

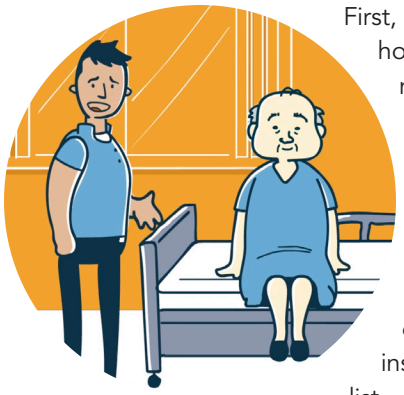
The post-discharge pilot sites began to serve patients in 2015. All sites have now been in operation for at least one full year; four of the sites are continuing the pilot program for a second year while one site discontinued due to funding constraints. Each of the pilot projects has a leadership team consisting of the local EMS agency, partners from one local hospital, and one or more transport organizations (fire department, ambulance provider). The Alameda and Glendale programs are city-specific, the Butte and Solano programs are available to all county residents, and the San Bernardino program is limited to residents of five cities within the county (Bloomington, Fontana, Hesperia, Rialto, and Victorville).

How It Works

There is one hospital partner in each pilot site, and patients hospitalized with the selected diagnosis or diagnoses are identified, screened, and referred to the CP pilot by hospital staff. To be eligible for a post-discharge call or visit with a community paramedic, patients in all sites must meet these criteria:

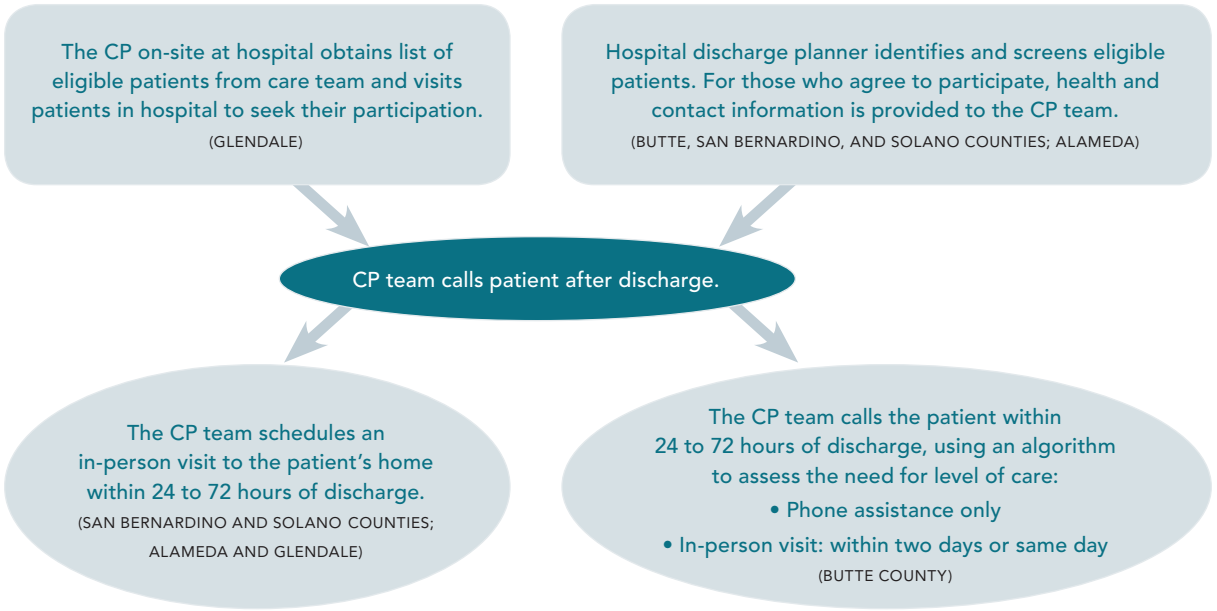
- Discharged to home with selected condition(s)

- Live in geographic area served by pilot
- Agree to participate in the project



First, patients are asked by hospital discharge planning staff or by the community paramedic if they are willing to participate in the project. For patients who agree, the hospital provides their diagnosis, discharge instructions, medication list, and provider contact information to the CP program. In all sites but San Bernardino County, this information is shared electronically. Figure 1 shows the eligibility assessment and patient contact processes for these post-discharge projects.

Figure 1. Eligibility Assessment / Contact Process for Post-Discharge Community Paramedicine (CP) Pilot Projects



Although their overall goals are the same, the projects vary in paramedic staffing and in the number of calls and visits provided (see Table 2, page 5). For example, the one full-time community paramedic on the UCLA/Glendale pilot worked with all the patients enrolled in the program. Alameda has a core group of full-time community paramedics. The other three sites incorporate CP activities into the overall job duties of the community paramedics. The Butte County and Alameda sites have additional paramedics who serve as alternates and are called upon when one of the regular community paramedics is not available. The post-discharge sites limit the number of calls and visits either in number (e.g., one or two) or time period (i.e., within 30 days after discharge).

In all five sites, as part of the post-discharge follow-up, community paramedics assess the patient for improvement in overall health and to identify issues that may require intervention from the patient's care team; review discharge instructions with the patient; review medications to ensure that the patient has filled all required prescriptions, understands how to take them, and does not have duplicate or conflicting medications at home; and review plans for follow-up appointments with the patient's care team.

At several sites, community paramedics also perform home safety assessments and make referrals to community services. All sites serve heart failure patients, and at several sites, the community paramedics noted that they counsel patients on lifestyle changes related to diet and exercise that will help patients manage this condition. For example, the community paramedics talk with heart failure patients about the importance of weighing themselves and carefully monitoring their liquid intake. Some CP pilot sites provide scales and blood pressure monitors to patients who need them.

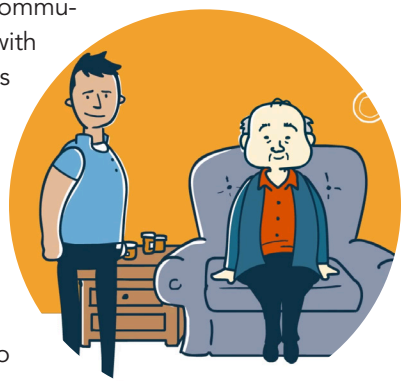


Table 2. Key Characteristics of Post-Discharge CP Pilot Sites

LEAD AGENCY	NUMBER OF PRACTICING COMMUNITY PARAMEDICS	STAFFING MODEL	TYPICAL NUMBER OF COMMUNITY PARAMEDIC CALLS OR VISITS PER PATIENT
Alameda County EMS Agency	5	Two dedicated, full-time positions staffed on a rotating basis among trained community paramedics.	One in-person visit; and more if needed
Butte County EMS	6	Three community paramedics provide CP services on an overtime basis in addition to their regular duties; three others assist on a part-time basis.	One call for most patients; additional calls or an in-person visit if needed
Medic Ambulance Solano	5	Paramedics provide CP services as part of their regular duties.	Two in-person visits; and more if needed
San Bernardino County Fire Department	13	Some paramedics provide CP services as part of their regular duties and others do so on an overtime basis.	One in-person visit
UCLA Center for Prehospital Care (Glendale)	1	One dedicated full-time position.	One in-person visit

Results

All the state's CP pilot projects are being reviewed as part of an independent evaluation conducted by researchers at the University of California, San Francisco (UCSF). (For a detailed report of the first-year results, see *Evaluation of California's Community Paramedicine Pilot Program*.)[6] The results summarized below show the impacts on patients receiving post-discharge calls or visits through the CP pilot projects.

Patients Served

In the first year of the post-discharge pilots, a total of 922 patients agreed to participate, and 799 received one or more phone calls or in-person visits from a community paramedic (see Table 3).[7] Most patients were discharged from the hospital with a diagnosis of heart failure (67%) or a heart attack (25%).

Table 3. Number of Patients in Post-Discharge Pilots, by Site and Diagnosis*

LEAD AGENCY	HEART FAILURE	HEART ATTACK	COPD	OTHER†	TOTAL
Alameda County EMS Agency	21	7	11	25	**64**
Butte County EMS	275	225			**500**
Medic Ambulance Solano	39		32		**71**
San Bernardino County Fire Department	133				**133**
UCLA Center for Prehospital Care (Glendale)	154				**154**
Total	**622**	**232**	**43**	**25**	**922**
Percentage of Total	*67%*	*25%*	*5%*	*3%*	*100%*

*Number of patients who agreed to participate through September 30, 2016.
†Includes diabetes, pneumonia, and sepsis.

Source: UCSF, *Evaluation of California's Community Paramedicine Pilot Program* (January 2017).

"Community paramedicine has the potential to save hospitals and other parts of the health care system money. If we can be efficient and do more to control health system costs, we can do more for patients."

— Rick Zombeck, deputy fire chief and EMS chief, Alameda Fire Department

Of the 799 patients who received one or more phone calls or visits, 56% were male and 14% were Latino. The racial breakdown was 80% white, 6% African American, and 5% Asian/Pacific Islander. Patients' health insurance coverage was primarily through Medicare (61%) and Medi-Cal (23%), while 14% had private/commercial insurance and 3% were uninsured. Payer mix varied substantially by location. The UCLA/Glendale pilot site served primarily Medicare beneficiaries, the sites in San Bernardino and Solano Counties served a large percentage of Medi-Cal beneficiaries, and the Butte County and Alameda sites had patient populations with more mixed insurance coverage.

Reducing Hospital Readmissions

The post-discharge pilot sites met the key goal of reducing the number of patients readmitted to a hospital within 30 days after discharge (see Table 4).[8] Butte County patients with heart failure were an exception; the readmission rate for these patients was slightly higher than the historical average at the partner hospital. It may be that the post-hospital discharge needs of patients with heart failure and of those who have had a heart attack are different, and that the phone call model is not effective for heart failure patients. The Butte County model involves only phone contact for about 90% of patients in the program, while all of the other pilot sites provide at least one in-person visit to all patients.

Patient Safety

The UCSF evaluation found no evidence of harm for patients enrolled in these five projects.[9] In fact, evaluators found improvements in patient safety due to

Table 4. Readmissions Within 30 Days for Partner Hospitals (2012-2015) vs. Post-Discharge Pilot Project Patients

DIAGNOSIS / SPONSORING AGENCY	NUMBER OF PATIENTS	PARTNER HOSPITAL HISTORICAL 30-DAY READMISSION RATE FOR ANY REASON	PILOT PROJECT PATIENTS READMITTED FOR ANY REASON percentage (number)
Heart Failure			
Alameda County EMS Agency	21	23.1%	14.3% (3)*
Butte County EMS	275	22.5%	25.8% (71)
Medic Ambulance Solano	39	22.1%	12.8% (5)*
San Bernardino County Fire Department	133	23.1%	9.0% (12)*
UCLA Center for Prehospital Care (Glendale)	154	24.4%	6.5% (10)*
Heart Attack			
Alameda County EMS Agency	7	16.8%	0% (0)*
Butte County EMS	225	17.2%	10.7% (24)*
COPD			
Alameda County EMS Agency	11	19.4%	0% (0)*
Medic Ambulance Solano	32	18.9%	9.4% (3)*
Pneumonia			
Alameda County EMS Agency	10	20.1%	10.0% (1)*

*Indicates that there was a statistically significant difference between the readmission rate for post-discharge pilot project patients and the partner hospitals' historical readmission rates.

Source: UCSF, *Evaluation of California's Community Paramedicine Pilot Program* (January 2017).

"One patient with COPD and heart failure was homeless and not regularly using her nebulizer or inhaler. She was discharged from the hospital three times in 14 months and referred to our CP program each time. She was not readmitted while we were providing services to her. We found businesses that would allow her to plug in her nebulizer and explained to her that she needs to carry and use an inhaler. We focus on how to make tangible changes that will have an impact."

— Brandon Klug, RN, integrated health manager
Medic Ambulance Solano

the work of community paramedics involving medication reconciliation, obtaining prescription refills in a timely manner, and securing follow-up appointments with clinicians.

Improving Patient Care

Another goal of the post-discharge pilots is to improve the quality of care provided. Medic Ambulance Solano uses a third-party vendor, EMS Survey Team, to assess patient perspectives related to their services, including community paramedic visits. They found that more than half of enrolled patients were incorrectly taking their medications (e.g., not taking prescription medications appropriately or at all, taking prescription medications that should have been discontinued) and that three-quarters needed help understanding discharge instructions. Patient self-assessments after receiving community paramedic visits showed several improvements: 16% in their rating of overall health, 11% in their understanding of discharge instructions, 4% in their understanding of when to take medications, and 9.5% in their understanding of medication side effects.

Cost Savings

The UCSF evaluation found that four of the five post-discharge sites realized cost savings ranging from $188 to $1,230 per patient per month.[10] Costs varied significantly due to several factors: higher costs for sites with full-time community paramedics than for sites using less-intensive staffing models, the diagnoses targeted by each site and the average cost of readmissions by diagnosis, the extent to which the site was able to reduce readmission rates compared to historical averages, and the number of patients served.

Implementation Challenges

Even with the successful development and implementation of post-discharge projects, leaders at the five sites identified several challenges.

- **Pilot project status.** The start-up nature of these projects presented several challenges. One major issue was identifying and securing funding. Also, sites had to actively design the pilot program rather than implement an existing program and, at the same time, identify, recruit, and train the community paramedics. For several sites, it took months for the various participants to get to know one another and establish strong working relationships; once these relationships were established, programs reported that ongoing adaptations were often needed.
- **Data exchange.** All sites need to be able to securely share protected patient data between the hospital and community paramedics; however, not all sites are able to do this since not all hospital partners have electronic medical records. In addition, some data systems allow paramedics to see information on only individual patient encounters rather than a complete record displaying all of a patient's diagnoses, making it more challenging to understand and effectively address a patient's underlying conditions.
- **Limited paramedic resource.** Sites were challenged by training a smaller number of community paramedics than planned due to costs associated with paying the community paramedic trainee plus another paramedic who backfilled their position and by paramedic shortages that effectively limited the number of patients they could serve. Paramedics at three sites juggled competing job requirements since they serve as both first responders and community paramedics; in Butte County and some cities in San Bernardino County, CP services were provided by paramedics on an overtime basis.
- **Language congruence.** Some sites articulated a need for multilingual community paramedics who can communicate effectively with patients whose primary language is not English.
- **Patient enrollment and participation.** Most sites had more patients eligible to participate than agreed to do so, and some had challenges with patients dropping out after agreeing to

"Our community paramedic would assess if the patient needed oxygen or a different type of home appliance, and he would get patients in to see their doctors. He also brought in the mail and changed a lightbulb — human touches. His ability to speak Spanish really helped — he engaged family members to enlist their support in caring for the patient, for example, to stop feeding him a salty diet. It meant a lot that he could speak their language."

— Steven Rottman, MD, medical director
UCLA Center for Prehospital Care

participate. Sites also reported difficulties in reaching patients due to unanswered phone calls, incorrect phone numbers, or patients having prepaid cell phones that had run out of minutes. Sites where many of the discharged patients were currently using illegal substances reported additional difficulties in enrolling and reaching patients, since these patients seemed more reluctant to have uniformed personnel enter their homes.

"A 60-year-old woman with heart failure and COPD was discharged from the hospital and referred to our program. She had recently moved from Texas and didn't stock up on her medications before she moved. One of the first things I did was help her get on Medi-Cal, and after that, find a primary care physician so she could get her prescriptions refilled. Then I helped her set up pulmonology and cardiology appointments. It's amazing how much improvement you can see in a month. When you talk with someone for a couple hours, you get to know them. You can dig deep to understand what problem is being compounded that results in their going back to the hospital."

— Cliff Henderson, community paramedic
Medic Ambulance Solano

Drivers of Implementation Success

Several factors were identified as contributing to each project's early implementation success. All sites attributed success to a strong team effort involving the EMS agency, fire department and/or ambulance provider leadership, the hospital staff, the program manager, and of course, the community paramedics.

The pilot sites also cited several other contributors to success including patient, family, and caregiver engagement; the community paramedics having access to primary care, specialty, and home health providers while conducting in-person visits; and the specialized state and local training that the community paramedics received. In Glendale, the paramedic was onsite at the hospital and integrated into the inpatient care team — he did rounds with them, collaborated with the medical and nursing staff, and recruited patients in the hospital. He then met with the patients in their homes after discharge. This process led to a sense of continuity for patients and a consistency in approach, since one paramedic conducted all the post-discharge visits.

Future Considerations

For the long-term viability of any post-discharge CP program, financing from entities that benefit from reduced admission rates, such as hospitals and insurers, will be essential. It is these entities that must see value in CP services and be willing to fund them on an ongoing basis. For communities interested in starting this type of program, participants in the pilot sites made the following recommendations.

"A 38-year-old woman, known to the ED staff as a fragile COPD patient, was admitted with heart failure. Three days after discharge, we called her. She was getting ready to call 911. It turns out she wasn't taking Lasix (a prescription drug used to reduce fluid retention) the way she was supposed to. We called the emergency department physician, who wanted to see her before adjusting her medications. While she went back to the ED, she was not readmitted."

— Mark Walker, community paramedic
Butte County EMS

Planning

Sites recommended conducting a community assessment to identify the greatest needs and areas of opportunity (e.g., hospitals with high readmission rates); identifying and engaging key decisionmakers at the EMS agency, fire department, ambulance service, and hospital to obtain their commitment; and seeking broad clinical involvement tailored to the diagnoses addressed (e.g., clinicians with expertise in cardiology for projects focused on heart failure).

Pilot sites also recommended that more CP personnel be trained than projected staffing requires so that paramedics are available in sufficient numbers to offset attrition. Sites also emphasized that all partners must be able to exchange data electronically so

that confidential patient information can be shared, program data collected, and reproducible metrics reported.

Implementation

Creative program design and diversified funding with shared risk arrangements are essential during the implementation phase. Program design considerations include the types of patients to include and staffing — full-time versus part-time, in-hospital versus outside, in-person visits versus phone calls. Continuity of staff contact in the hospital, on a post-discharge follow-up phone call, and at an in-person visit may help to increase the number of people referred to a CP program and who ultimately agree to receive services. Several sites described the importance of building awareness of the program with potential partners. These connections help community paramedics create an inventory of local resources including food banks, substance abuse treatment programs, adult protective services, and homeless shelters to share with patients.

Ongoing Maintenance

Sites suggested that the maintenance phase include additional CP training and professional development such as establishing CP as a career path; involving practicing community paramedics in content development for future training curricula; and encouraging interaction among community paramedics by creating a professional organization or holding statewide, regional, or local meetings/learning communities.

"We visited a 38-year-old man with a 4-year-old daughter. He had heart failure and was not taking care of himself. His issues weren't medical but more mental health and depression. With a diagnosis of heart failure, it's hard to find the light at the end of the tunnel. We referred him to resources, spent an hour listening and coaching, and explained that he had to make some changes. Things really turned around for him: He's now back to work and happy."

— Kyle Hauducoeur, fire captain and community paramedic
San Bernardino County Fire Department

About the Author

Karen Shore, PhD, is an independent health policy consultant. Shore previously served as program director for the Institute for Clinical and Economic Review, where she ran the California Technology Assessment Forum, and as the president and CEO of the Center for Health Improvement.

Acknowledgments

Photo courtesy of Medic Ambulance Solano. Illustrations by Ruben DeLuna.

About the Foundation

The California Health Care Foundation is dedicated to advancing meaningful, measurable improvements in the way the health care delivery system provides care to the people of California, particularly those with low incomes and those whose needs are not well served by the status quo. We work to ensure that people have access to the care they need, when they need it, at a price they can afford.

CHCF informs policymakers and industry leaders, invests in ideas and innovations, and connects with changemakers to create a more responsive, patient-centered health care system.

For more information, visit www.chcf.org.

Endnotes

1. 22 CCR §100146.
2. In October 2012, Medicare began reducing payments to hospitals with excess readmissions related to heart attacks, heart failure, pneumonia, hip or knee replacement, and COPD.
3. The pilot projects began in 2015 (one site each began in June, July, and August, and two sites began in September) and report data quarterly; the most recent quarter for which data are available ended September 30, 2016.
4. Hines, Anika L. et al., "Statistical Brief #172: Conditions with the Largest Number of Adult Hospital Readmissions by Payer, 2011," Agency for Healthcare Research and Quality, April 2014, www.hcup-us.ahrq.gov.
5. California paramedics receive a minimum of 1,090 hours of training in addition to the 160 hours of training they received as an emergency medical technician (EMT).
6. UCSF, *Evaluation of California's Community Paramedicine Pilot Program* (January 2017), healthforce.ucsf.edu.
7. Ibid.
8. Ibid.
9. Ibid.
10. Ibid.