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Maine EMS Community Paramedicine Pilot Program Evaluation

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November 2015

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INTRODUCTION

Community paramedicine is a healthcare delivery model that traces its genesis in this country back to the 1990s. In the 1990s, New Mexico rural emergency medical services (EMS) providers developed and tested a new model that expanded the scope of EMS services to include preventive care. This model sought to serve patients earlier in the disease process, reduce unnecessary transports, conserve emergency resources, and take advantage of down time of rural EMS providers.[1] Since then, the model has evolved in various states, with EMS providers providing a range of preventive and disease care management services to patients in their homes or other community settings.

AUTHORIZING LEGISLATION

In 2012, the Maine Legislature passed legislation granting the Board of Emergency Medical Services the authority to approve up to 12 community paramedicine (CP) pilots for a period of up to three years (L.D. 1837).[2] Maine is uniquely positioned as one of the first to provide statewide legislation authorizing this many community paramedicine initiatives. The Board of Emergency Medical Services approved the application process developed by Maine Emergency Medical Services to enable local emergency medical services to apply to become a community paramedicine (CP) pilot site. The legislation did not provide funding for the pilot projects; in applying to become a pilot project, the potential applicants had to assume all costs.

DEFINITION OF MAINE'S COMMUNITY PARAMEDICINE PILOT PROJECT

Community Paramedicine is defined by Maine's authorizing legislation as the practice by an EMS provider primarily in an out-of-hospital setting, providing episodic patient evaluation, advice, and treatment directed at preventing or improving a particular medical condition. It should be noted that CP does not expand the scope of practice, which is established by the Maine Medical Direction and Practices Board; it only expands the sphere of practice. Additionally, each EMS service in the CP pilot program must include a primary care physician and an EMS medical director as part of their pilot project for training, staffing, and quality assurance purposes. Potential CP pilot projects could apply to provide a range of services within their respective scope of practice based on identified community needs. Table 1 (page 2) provides a description of the 12 Maine Community Paramedicine pilot sites with their start dates.

1 Hauswald MR, W.; Brainard, A.H. *A Description of the Red River Expanded EMS System: Its Community Health Impact and Lessons for the Future, a Report to the State of New Mexico Department of Health.* Albuquerque, NM: Department of Emergency Medicine, School of Medicine, University of New Mexico; February 28, 2013.

2 *An Act to Authorize the Establishment of Pilot Projects for Community Paramedicine,* LD 1837, HP 1359, 125th Maine Legislature, Second Regular Session; March 29, 2012.

Table 1. Maine Community Paramedicine Pilot Site Descriptions

Maine Community Paramedicine PILOT PROJECTS	Affiliation	Start Date	ACTIVITIES
Calais Fire and EMS Calais	Municipal (Fire-Rescue)	8/12/2013	In-home management of chronic diseases (CHF, COPD, hypertension); physical assessments/vital signs; medication reconciliation/compliance; home safety assessments, blood draws; 12-Lead EKG
Castine Fire Rescue Castine	Volunteer	8/1/2013	Focus on prevention; chronic disease management; monitor vital signs; home safety checks; medication reconciliation; diet/weight monitoring; wound care; other physician-directed care/treatment within the EMS scope of practice
Charles A Dean EMS Greenville	Hospital-based	10/1/2013	In-home management of chronic diseases (CHF, COPD/asthma, diabetes); medical assessments; wound care/assessment; medication reconciliation/compliance; home safety assessments, phlebotomy, blood glucose analysis; non-emergent cardiac monitoring and infusion maintenance. All within EMS scope of practice
Crown Ambulance Presque Isle	Hospital-based	5/12/2013	Chronic disease management/monitoring (diabetes, CHF, post MI conditions and other coronary syndromes; COPD/asthma); blood glucose testing; wound assessment; routine eye exams; draw labs as needed; weight monitoring; medication reconciliation; spirometry testing and management of O2 delivery services
Greater Kennebec (Delta/Winthrop EMS services) Augusta and Winthrop	Private EMS Service	3/18/2013	Address needs of recently discharged patients and recovering surgical patients; episodic assessment of patients with multiple comorbidities (i.e. CHF, COPD); weight/O2 saturation assessments; home safety assessments for at-risk patients; wound assessment

Lincoln County Healthcare Damariscotta, Boothbay Harbor and Waldoboro	Mix of hospital and healthcare system and 3 local EMS services	3/1/2014	Post-discharge services; monitoring of chronic illnesses (i.e. Diabetes, CHF); readmission preventions; wound care assessments; diagnostic testing
Mayo EMS Dover-Foxcroft	Hospital-based	10/1/2013	Address needs of cardiac (including post MI/cardiac rehab) and diabetic patients with routine screenings, ECGs, medication reconciliation; blood glucose measurements
NorthStar EMS Farmington	Hospital-based	11/1/2013	Reduce # of ER visits and hospital admissions by monitoring at-risk patients with multiple medical conditions; patient education; post-discharge surgical patients without home health services; home safety assessment; medication reconciliation; episodic assessments of weight, BP, oximetry, heart rate
North East Mobile Health Scarborough	Private EMS Service	6/1/2013	Fall risk assessment and trauma care follow-up
Searsport Searsport	Private EMS Service	12/26/2013	Develop and implement fall prevention program; facilitate immunization; track patients with chronic diseases (esp. diabetes); well-check visits and assessments as directed by physician
St. George EMS Tenants Harbor	Volunteer (some paid staff)	6/1/2013	Address identified community needs of diabetes, respiratory distress, hypertension, post-surgical/post discharge patients; blood draws; episodic assessment/care; medication reconciliation/ compliance or other services directed by the PCP
United Ambulance Lewiston	Private EMS Service	5/8/2013	Focus on non-emergent 911 callers to decrease the number of time the ambulance is utilized for these situations; work to reduce re-hospitalization rates for chronic disease patients (CHF, COPD, diabetes); well-being checks; home safety inspection (including fall risk assessment); blood glucose monitoring and patient assessment; wound care assessment and treatment as directed by PCP

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METHODOLOGY

In November 2014, the Muskie School of Public Service at the University of Southern Maine was awarded a contract to evaluate the implementation of the statewide CP Pilot Program in Maine. This report presents process level results from the evaluation. The report includes findings from interviews with the twelve community paramedicine pilot sites in Maine and with the state of Maine EMS office.

The Muskie School evaluation team developed a CP Pilot project interview protocol that was approved by both the University of Southern Maine Institutional Review Board (IRB) as well as the Maine EMS Board (Appendix A). Interviews were arranged with each site's CP coordinator and key personnel involved in the CP initiative, including the EMS director, primary care physician (PCP), and other community paramedics as available. For the majority of the interviews, only one or two staff were able to be interviewed; in a few cases, the pilot site's medical director was present. The interviews with the 12 CP pilot sites took place between February and March, 2015. All interviews were recorded and transcribed for analysis purposes.

The Muskie School evaluation team also monitored the number of CP visits (or "runs" as is the general EMS terminology) between the third quarter of 2013 through the second quarter of 2015 by analyzing data from Maine EMS Run Reporting (MEMSRR) System. Additionally, the evaluation team reviewed all the pilot site applications to ascertain how the pilot sites planned to implement and staff their respective programs. The results from the reviews were compared to interview findings to determine whether changes had been made at the pilot site level, and how the pilot sites implemented their programs.

The layout of the report follows the key themes and categories from our interviews:

- Staffing
- Training
- Stakeholders and Partners
- CP Services
- CP Event
- Data Collection
- Funding
- Challenges
- Successes
- Sustainability

The report concludes with lessons learned which may be helpful for future community paramedicine pilot projects.

STAFFING

Staffing the community paramedicine pilot project was up to each individual pilot site and was to be delineated as part of the application process. Many of the pilot sites are small EMS agencies in terms of the number and types of staff, with a mix of EMT and paramedics with both basic and advanced lifesaving skills (BLS and ALS). The variation across the sites also includes a mix of paid (salaried and per-diem) and volunteer staff.

Each pilot project designated a staff person as the community paramedicine coordinator. In many of the smaller agencies, the coordinator was often the EMS chief or the assistant chief. In some of the larger agencies, such as United Ambulance, the CP lead was someone other than the director or chief. In the case of United Ambulance, the CP lead is the Prevention and Wellness Coordinator.

Most of the pilot sites approached staffing in one of two ways, either by direct, internal recruitment or through cross-training of the entire staff. According to the Maine EMS office, the original thinking was that staffing the CP pilot project could be handled with existing staff during their "down time." Most agencies recruited potential community paramedics from within their ranks. For example, NorthStar specifically recruited those staff who were interested in serving as community paramedics. A few agencies, most notable the smaller ones, encouraged their entire staff or most of the staff to be formally trained as community paramedics with the understanding that this type of cross-training would make it easier to staff the CP pilot project. This approach was pursued by both Crown and Mayo. United, one of the larger pilot sites, staffs their program with two licensed paramedics who have additional training and certification in community paramedicine.

To avoid additional staffing costs, the majority of the community paramedicine pilot sites employ full- and part-time staff, including EMTs and paramedics to provide CP services during their daily shift in addition to being available for emergency response in the community. Although most sites appear to have a mix of full- and part-time staff, some have staff specifically hired for the CP project. For example, St. George Ambulance's EMS agency hired paramedics to respond to EMS and provide basic healthcare, while volunteers respond to 911 calls. Castine Fire and Rescue, another example of a CP program with volunteer staffing, has found staffing difficult for their CP project, and they have lost some of their volunteers to retirement, lack of interest, and concerns about visiting patients in their homes alone, specifically elderly women.

The shift of focus to include CP is not what EMTs and paramedics expect from emergency response work. The EMS service chief and assistant fire chief in Castine notes that it can be challenging to get EMTs to perform CP work because they prefer the excitement of emergency calls. In their rollout training, Maine EMS suggested services first conduct an assessment of their respective cultures to get a sense how many of them would embrace this new job duty.

TRAINING

As part of the CP pilot application process, potential pilot sites were required to detail their training plans for their CPs. The responses to this requirement fall into two broad categories– internal and external training. As outlined in their proposals, pilot sites choosing to conduct internal training typically had their medical director and/or nearby hospital staff in their catchment area lead the training. The specific training components

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The primary care physician (PCP) is a key stakeholder vital to the success of the CP initiative.

focused on the CP services delivered by each site. For example, in Calais the training plan included blood draws and medication reconciliation, two key aspects of their program. In Castine, their training included such topics as interacting with the elderly, conducting basic vitals and basic dressing changes, blood glucose monitoring, etc. The number of hours of training depended on the services to be provided.

From the interviews, the evaluation team learned that Mayo Regional Hospital provided clinical training for all community paramedics, which involved eight hours of training prior to launching their pilot. This training included wound care, labs, chronic conditions, and orienting paramedics to non-emergent care. At Mayo, staff also indicated they would like training on dementia, a medical condition CPs encounter with some frequency among the state's aging population. NorthStar Ambulance has their staff complete one day-long in-house training which includes home safety training and prescription medication reconciliation. Lincoln County Healthcare also mentioned taking the opportunity for additional hands-on training during CP visits when extra staff is available, so that CP staff can go to home visits in pairs.

External training often consisted of an EMS agency sending their CPs to a training or certification program offered by an outside, accredited organization. With the proliferation of CP programs in this country, the need for training has risen, and several colleges and community colleges have developed certificate programs to meet this demand, including Northern Maine Community College. One certificate program that many EMS agencies use is offered by Colorado Mountain College, which involves both an online instructional component of 120+ hours and a local clinical rotation. Crown, Searsport, and St. George all specified in their applications that the CPs in their pilot projects would have their CPs obtain certification through the Colorado Mountain College. Hennepin Technical College in Minneapolis, Minnesota also offers online training specific to community paramedicine, although only C.A. Dean's embedded case manager and the staff at United Ambulance discussed utilizing this formal training.

External training, whether online or offsite, requires resources both in terms of time and money. Due to the absence of state funding, the pilot sites used their own local resources to pay for these CP training opportunities for their staff. Several EMS agencies had multiple staff members take part in this type of training, adding to their overall expenses. Searsport Ambulance, for example, was concerned about the training expense and decided to pursue grant funding to cover this expense.

STAKEHOLDERS/ PARTNERS

While staffing and training are integral components of the CP pilot process, so too is stakeholder and community engagement. Stakeholders and partners are critically important in the development and implementation of community paramedicine efforts. All pilot sites noted the need to develop relationships in the community, not just with the healthcare providers, but also with local social services and faith-based organizations. Home health agencies typically see CP providers as potential competitors, but those CP pilot sites that have brought home health into the stakeholder group or contacted them prior to the implementation of their community paramedicine pilot project have engendered the support of the local home health service. In some cases, the community paramedics will be called upon by the home health agency to make the initial home visit when the patient has been discharged from the hospital, awaiting home health eligibility determination. In the case of Delta Ambulance (Greater Kennebec CP pilot site), the primary care physician (PCP) for the pilot project has a good relationship with both home health and the CPs, so the PCP makes sure that the home health agency is aware of the CP services. For example, at the Greater Kennebec CP pilot site, when home health knows a person is ending their coverage with home health but are still not able to fully function or get out of the house to the doctor's office, etc., they contact the PCP and suggest that this person may benefit from a CP visit. Additionally, more than half of the CP pilot projects noted that home health will coordinate with CPs in the event that the home health nurse cannot get to a particular patient in the scheduled timeframe.

The primary care physician (PCP) is a key stakeholder vital to the success of the CP initiative. Several CP sites report that obtaining the buy-in from the PCP, who initiates the referral, as well as from the hospital, is a difficult process.

Other stakeholders and partners mentioned by the CP pilot projects include local hospitals and medical practices, family practices, district nurses, Community Care Teams, Kiwanis, food pantries, local churches, and town officials (e.g. town manager, selectmen, and fire department). Both Mayo and C.A. Dean have collaborated with the Charlotte White Center's Thriving in Place (TIP) initiative. According to the funder of the TIP initiative, it "gives healthcare providers and their community partners opportunities to develop and implement innovative, collaborative strategies that will meet the healthcare needs of adults with chronic health conditions (including elders and persons with disabilities) who are at high risk for in-patient or institutional care, so they can remain healthy and thriving in their homes and communities." Being able to build in the community paramedics as part of the TIP strategy has been beneficial both to the CP program as well as the TIP initiative.

The Director of Community Health, Wellness and Cardiac Rehab at Central Maine Healthcare, a partner in the community coalition of 10-14 agencies in the Lewiston area which includes United Ambulance, has high praise for the work of United's community paramedics. She stated that "the unique aspect of these trusted paramedics going into a client's/patient's home to provide (free) services demonstrates a clear commitment to the care of a person in an environment that is most suited to his/her well-being. We know the stress people feel when they are not in their own homes and that many people are overwhelmed when in a hospital setting and are unable to comprehend what is being asked of them for their self-care. As a community paramedic evaluates the

person in their home environment and provides the service in the space likely comfortable to them, it promotes healing, buy-in, and an awareness of potentially unsafe situations. Many of these individuals use emergency services for general help and have little knowledge of or access to resources. We have had a community paramedic meet a patient while in the hospital and plan for service follow-up. This has eased the transition from hospital to home. It is a tremendous asset as we collaborate to avoid un-necessary readmissions."

The importance of stakeholders in the CP program cannot be overstated. These community members, through their positions on hospital boards, social service agencies, and faith-based organizations, are integral to the public perception and buy-in regarding the value of the CP program.

SERVICES

Community Paramedicine pilot sites were careful to develop their projects to meet one or more unmet needs in their respective communities, and engaged stakeholder and other community partners in doing so. In their CP pilot applications, the Maine EMS office asked potential applicants to define the type of pilot project it was proposing—either Extended/Enabled Community Health Pilot Project or General Practice Community Paramedicine. According to Maine EMS Community Paramedicine Pilot Project application, an Extended/Enabled Community Health Pilot Project is one that addresses specific community health needs that are not being adequately met by other health provider resources. The second type, the General Practice Community Paramedicine project, is one that utilizes Maine EMS licensed paramedics who have graduated from a nationally recognized college-based community paramedicine program, or who possess a nationally recognized equivalent set of training and experience. All 12 pilot sites sought approval to participate as the Extended/Enabled Community Health Pilot Project, primarily because it allowed the sites to utilize existing staff, such as EMTs, for the community paramedicine initiative. Applicants were asked to provide a general project description which included the community or communities to be served, the service base location(s), the current community health team members participating, the community health need being addressed, and the methodology for addressing the need.

Although the health issues selected by the 12 pilot projects vary, there are some commonalities across the sites. Most of the health issues chosen are associated with chronic conditions, including services needed by older Maine residents or those seeking to "age in place." To determine the health services addressed, the Muskie School evaluation team reviewed all 12 CP pilot site applications and analyzed the interview notes to see if any services had been added after the applications had been submitted. Most notably, United Ambulance added new services to their CP visits, including offering wound care and flu vaccines.

Table 2 (page 9) reveals that nine (75%) of the twelve CP pilot sites focused on providing medication reconciliation and compliance services as well as offering treatment to individuals with diabetes. While the specific medication reconciliation and compliance services vary somewhat among the pilot sites, in general it includes patient assessment, medication reconciliation, and general education about the patient's prescribed medication. For those with diabetes, community paramedic services typically includes conducting physical and medical assessments, standard assessment of wounds, blood glucose analysis, and blood or lab draws. Table 2 also shows that many of services provided by community paramedics are geared towards the

elderly or those dealing with chronic conditions. Eight pilot projects are providing fall risk assessments/home safety checks and monitoring vitals. These services as well as others on the list are geared at keeping older Maine residents in their homes and preventing unnecessary ambulance transports to the emergency department or hospital.

More than half of the pilots are providing wound care or minor surgical follow-up care in the home. This service is especially helpful to those patients who have limited transportation options or have to travel far distances to a hospital or medical facility for follow-up care after discharge.

Table 2. Services Provided by the Maine Community Paramedicine Pilot Projects

SERVICE	C.A. Dean	Calais EMS	Castine	Crown Ambulance	Greater Kennebec	Lincoln County	Mayo	North East	NorthStar	Searsport	St. George	United Ambulance	
Medication Reconciliation		x	x		x	x	x	x	x		x	x	9
Diabetes Care	x	x		x	x	x	x			x	x	x	9
Fall Risk Assessment/Home Safety		x	x		x	x		x		x	x	x	8
Monitoring Vitals/Physical Exam			x		x	x	x	x	x		x	x	8
Wound Care/Surgical Follow-up		x	x		x	x	x		x		x	x	8
Blood Draws		x			x	x	x				x	x	6
Vaccine Administration					x	x	x		x	x		x	6
CHF Care	x	x		x	x		x					x	6
COPD Care	x	x		x	x						x	x	6
Asthma Management	x			x	x						x	x	5
Diet/Weight Monitoring			x			x	x					x	4
Hypertension	x	x									x	x	4
Edema Assessment						x						x	2

United Ambulance has been monitoring the types of CP interventions it provides in the greater Lewiston area. Figure 1 (page 10) lists the monthly interventions their community paramedics provided from May 2013 to April 2015. During this period, United Ambulance conducted 981 CP runs. On all of these runs a "wellbeing check" was carried out, which included a basic assessment and vital signs. In addition, some of the CP runs involved multiple interventions. Nearly half (48.3%) of all the interventions during this two-year period were for wellbeing checks. An additional quarter (24.8%) of the interventions delivered by the United community paramedics were for medication reconciliation. These two intervention types accounted for nearly three-quarters of all United's interventions. It should be noted that some intervention types (e.g., flu

vaccinations and basic wound care) were not initially offered in 2013, but added to their service mix as their CP project evolved.

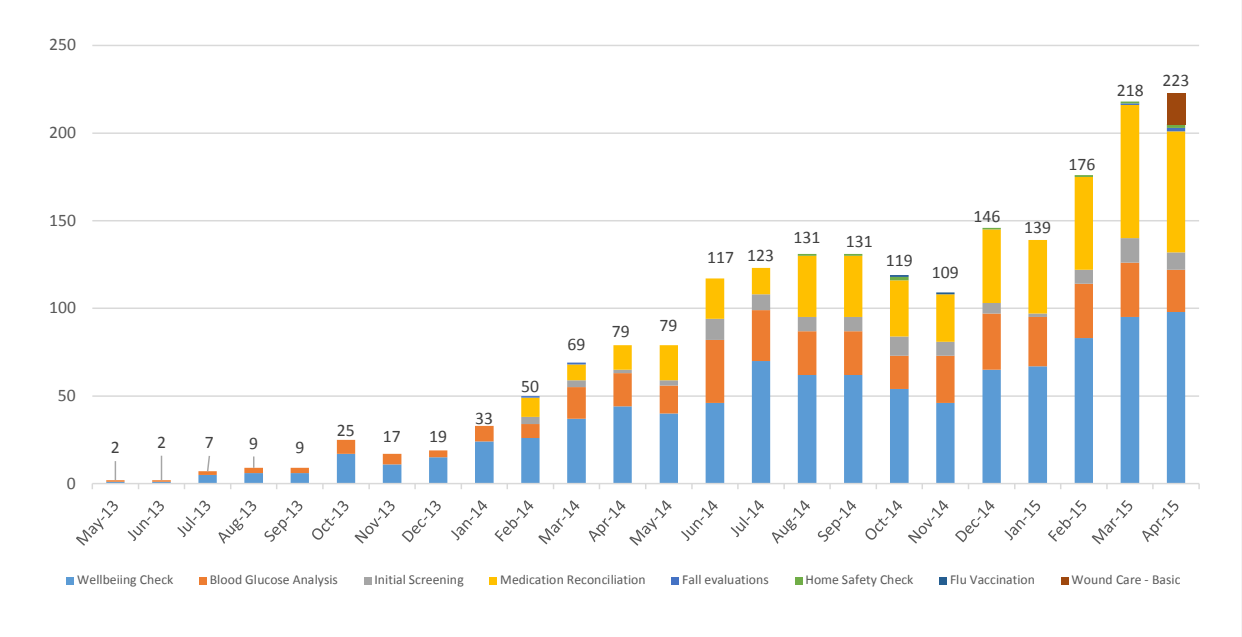
CP PROCESS

The types of services provided by a community paramedic vary across the pilot sites, but the specific process of a CP event—from PCP referral to documentation in MEMSRR usually follows a similar sequence. In most cases, a PCP makes a referral to the EMS agency to follow-up on a patient. In some cases, a hospital staff member (e.g. emergency room physician) may initiate a referral. However, before a referral commences the patient's PCP must be contacted and briefed before a CP visit takes place.

Once a PCP or other provider has identified a potential patient, they send an order to the EMS agency, usually by fax. The EMS agency staff, usually the community paramedic, contacts the potential patient by phone, explains the program and then, if the patient is willing, schedules an appointment. These visits are fit into the daily EMS schedule as time permits. Most of the visits are conducted during regular business hours. Patients know in advance that the community paramedic may be called out on an EMS run, and that the home visit will need to be rescheduled.

Once the initial visit has been scheduled, the CP will go to the patient's home or, in some cases, meet the patient at a designated location. The CP will provide the patient with information about the CP project, conduct the assessment or service per the PCP's order, and, if necessary, schedule a follow-up visit. In many instances, the CP may also assess the patient's situation to ascertain whether the patient has social service needs. Once the CP returns to the office, s/he will submit paperwork to the patient's PCP to keep him/her informed of the patient's condition in order to coordinate care. The CP will then enter the visit information into the MEMSRR. Some EMS agencies have their own tracking databases and will enter the CP visit information there for internal review and analysis.

Figure 1. United Ambulance Community Paramedicine Program: Intervention Totals



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All CP data are entered in the MEMSRR System.

All the CP pilot sites have quality review built into their processes, which generally includes 100% review of all CP visits. Reviews are conducted by the QA/QI committees that are established at each pilot site.

On the next page there is a generic flow diagram based on the one that Lincoln County Healthcare uses which provides the essential process of a CP event (Figure 2). See also Appendix B for referral flow charts from Delta Ambulance, Lincoln County Healthcare, and Mayo Regional Hospital.

DATA COLLECTION

As mentioned previously, all CP data are entered in MEMSRR System. The MEMSRR System was designed to collect EMS data from each of the licensed service providers in the state.

EMS AGENCIES ENTER INFORMATION ON THE FOLLOWING:

- location where the EMS runs took place (e.g. city and county)
- date and time of the call
- provider impression
- response disposition
- service response request (e.g., emergency response, inter-facility transfer, community paramedicine, etc.)
- dispatch reason
- cause of injury
- procedure administered
- medication administered
- past medical history
- average run mileage and time
- response urgency (e.g., immediate and non-immediate)
- runs by location type (e.g., home/residence, healthcare facility, etc.)
- barriers to patient care
- age, gender, race, ethnicity
- transport hospital
- type of destination
- patient's insurance type

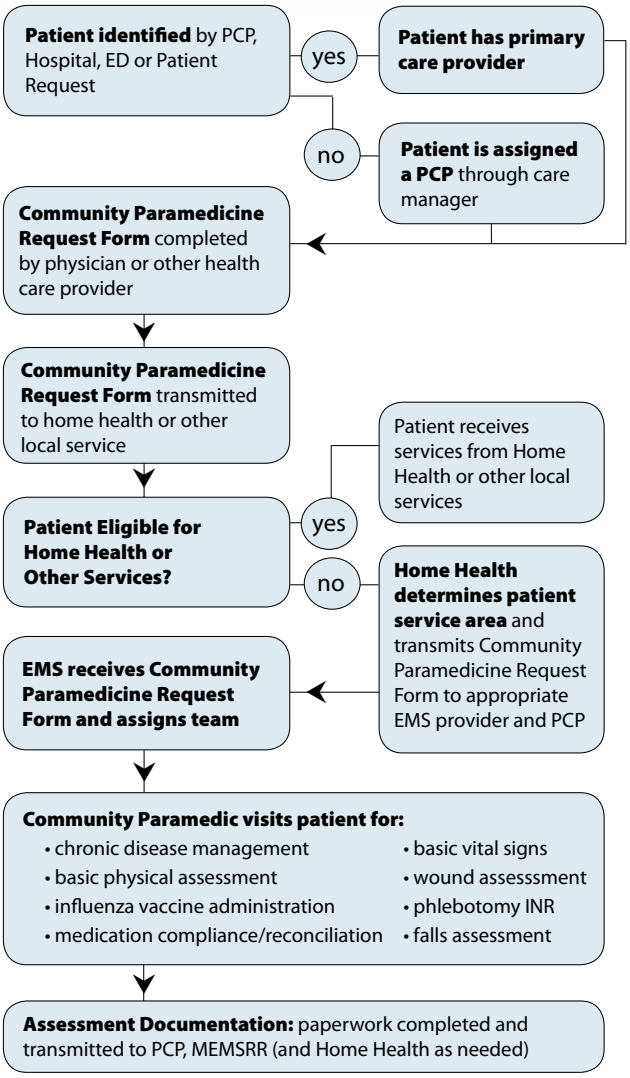
MEMSRR was designed long before the CP pilot was launched. It was modified soon after the pilot project commenced to enable the pilot sites to capture information on their pilot programs. Maine EMS added Community Paramedicine to its list of types of services requested in MEMSRR. However, MEMSRR was designed primarily to detail transport and emergency care information, something CP projects do not do.

MEMSRR does not include a category for provider impression or response disposition for CP runs. Most CP pilots use "No Apparent Illness/Injury" and "No Treatment Required," neither of which reveals much about the nature of the visit. Further, MEMSRR does not allow the user to provide any information about ongoing patients or longer-term outcomes. Since many CP patients are repeat patients, this feature would be beneficial, according to the participants interviewed. Many pilot sites print CP pilot information from MEMSRR and fax it to the patient's PCP. While this practice is fairly common, not all CP pilots fax the run information to the patient's PCP on a consistent basis.

For EMS agencies that are part of larger healthcare systems, MEMSRR presents some additional challenges. The system is not easily linked with electronic medical record systems and as a result it requires health systems to navigate between two or more systems, presenting some barriers to coordinating care when patients are being are transferred from one clinic to another within a system. For example, Lincoln County Healthcare-Miles Campus scans run reports from the three Lincoln County EMS agencies that are participating in the CP pilot into EPIC, the electronic health record system used by the MaineHealth network, and then has to enter this information into MEMSRR.

For some sites, capturing CP run information requires double data entry. Some EMS agencies

Figure 2. Community Paramedicine Referral Map



(e.g. United Ambulance) with more staffing and IT capacity have been able to work around this system by establishing an interface between their record systems and MEMSRR, enabling them to periodically upload their run information to MEMSRR without having to enter it a second time. However, this is more of the exception than the norm among CP pilot sites. There are additional concerns about this uploading procedure and whether records are being uploaded more than once, creating duplications in MEMSRR.

When the statewide pilot program was first launched, the individual CP pilot sites were required to have a data collection plan in place in addition to using MEMSRR. A review of the applications revealed many references to other possible data collection efforts. For example, NorthStar indicated they would be tracking referrals, recording the number and type of procedures, following patients for 30, 60 and 90 days to determine hospital visits, assessing physician and patient satisfaction, identifying hospital trends, and reviewing whether appropriate care was dispensed during the CP visits.[3]

As mentioned earlier, Lincoln County Healthcare is scanning CP run information into the EPIC system. Mayo Regional has developed a spreadsheet to track CP runs. Likewise, Delta Ambulance is using a spreadsheet to log primary diagnosis. C.A. Dean has developed a spreadsheet which includes some data from MEMSRR; this information is used internally for quality improvement purposes. Similarly, St. George has implemented a tracking sheet that it places in the patient's file. This information can be aggregated for quality assurance purposes. North East Mobile Health has developed a falls prevention data entry system for iPads though it has not been used fully due to other difficulties in implementing their CP project. United is using an external vendor's system platform to track data for each CP visit.

In addition, interview participants cited their desire to administer some type of patient satisfaction survey. While two (Lincoln County Healthcare and Mayo Regional) had drafted surveys at the time of the interviews, no patient or provider satisfaction had yet been administered.

Lastly, in January 2015, the evaluation team and Maine EMS hosted a data collection webinar featuring Matt Zavadsky, Executive Director of Fort Worth (TX) MedStar Mobile Integrated Health and a nationally recognized expert on data collection for community paramedicine. He is also a member of a national committee that is looking at performance measures for CP. Zavadsky's webinar was designed to help the Maine CP pilot sites understand core data elements to help provide a business case for the value of CP both clinically and financially. See Appendix C for materials provided to the CP pilot sites as part of the webinar.

Community Paramedicine Runs by Quarter

On a quarterly basis, the evaluation team logged into the MEMSRR system to compile community paramedicine (CP) run totals. As of June 30, 2015, the pilot program had been in place for two years. The evaluation team compared changes in run totals from Year 1 (FY14) to Year 2 (FY15). It should be noted that in FY14 the CP pilot sites were just starting, and therefore, as would be expected, the number of runs was lower than those in FY15 (Figure 3, page 14).

Table 3 (page 15) shows the quarterly runs by each CP pilot site. In FY14, the 12 pilot sites made 717 CP runs, with United Ambulance accounting for 41.1% of that total. In FY15, the number of CP runs increased to 1,987 or 177.1%. Since the last quarter of FY14 (4/1/14-6/30/14), the pilot sites have consistently topped 400 runs with the last two quarters exceeding 500 runs.

In FY15, United Ambulance accounted for nearly half (48.9%) of all the CP runs. Over the first year, United Ambulance had 47.1% of all the CP runs. Mayo had the second highest run total. Their number of runs increased 128.3% from FY14 to FY15. Following Mayo was the Lincoln County Healthcare collaborative featuring the Boothbay, Central Lincoln, and Waldoboro EMS agencies. This CP pilot site saw its runs increase from a total of 30 in FY14 to a total of 383 in

3 NorthStar EMS Community Paramedicine Pilot Project Application, August 22, 2013.

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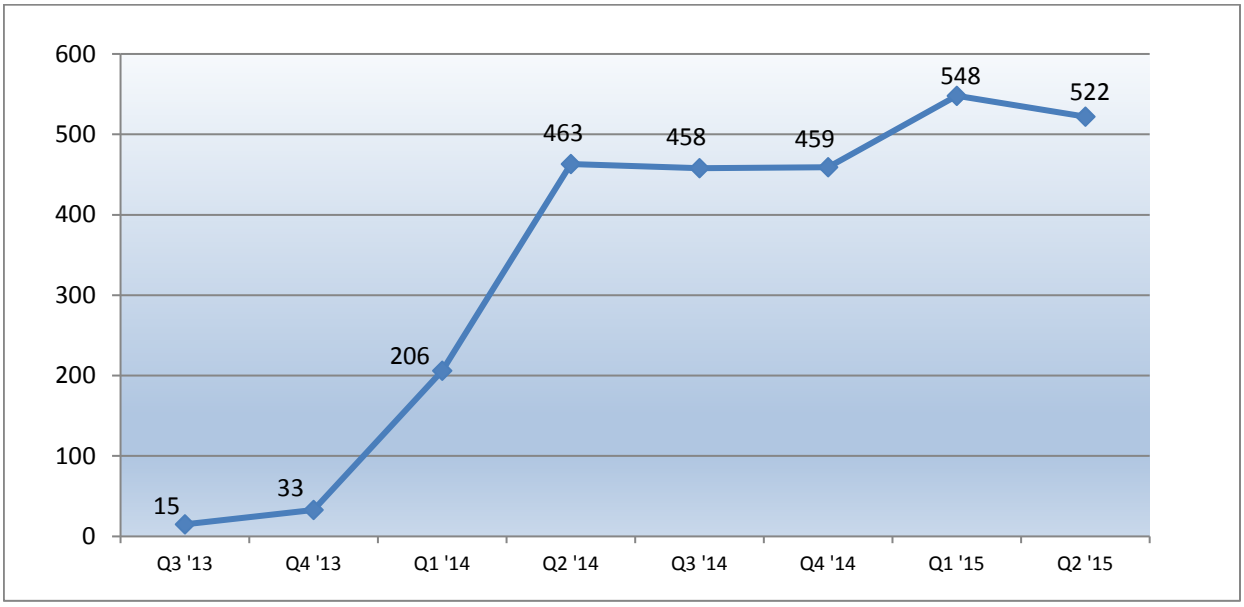
The evaluation team also developed a worksheet to help determine site-specific costs of providing a community paramedicine program.

FY15, an 1176.5% increase. These three pilots (United, Mayo and Lincoln County) accounted for 80.5% of all CP runs in the first two years. Some pilots, most notably North East Mobile Health Services, Crown Ambulance, and Calais EMS had fewer than 20 runs during the first two years. For unforeseen reasons (e.g. local partnership failing to materialize, change in administration, and collective bargaining issues), North East Mobile Health Services' pilot project was never fully implemented.

Figure 3. All CP Pilot Sites Community Paramedicine Runs by Quarter



COMMUNITY PARAMEDICINE COSTS

Estimated Cost Avoided

The MEMSRR system does not enable the user to determine how many unique individuals have been served by the CP pilot sites. As a result the evaluation team was not able to determine the number of patients accounted for by the 2,704 runs. Further, estimating emergency room cost avoidance is problematic since many of the CP runs are non-emergent.

Because the healthcare services the community paramedic provides is one of prevention (keeping the patient out of the ED or from being readmitted), many pilot sites noted that it is difficult to put a cost on this service. As a way of tracking this data, at least one of the sites is developing a checklist for the criteria they use to determine when their CP visits qualify as preventing an ambulance transport, trip to the ED, or hospital admission.

To help in understanding the potential value the CP pilot sites provide to the healthcare delivery system in terms of prevented hospital

Table 3. CP Runs by Individual CP Pilot Projects

Individual CP Pilot Projects	2013		2014				2015		TOTAL
	Jul. 1 - Sept. 30	Oct. 1 - Dec. 31	Jan. 1 - Mar. 31	Apr. 1 - Jun. 30	Jul. 1 - Sept. 30	Oct. 1 - Dec .3 1	Jan. 1 - Mar. 31	Apr. 1 - Jun. 30	
C.A. Dean	0	2	8	12	5	0	0	3	30
Calais EMS	0	0	0	0	0	12	7	0	19
Castine	0	0	1	12	12	17	12	9	63
Crown Ambulance	0	0	7	7	1	0	0	1	16
Greater Kennebec	15	8	22	21	19	26	10	6	127
Delta	15	8	17	12	5	10	4	6	77
Winthrop	0	0	5	9	14	16	6	0	50
Lincoln County	0	0	2	28	80	114	116	73	413
Boothbay	0	0	0	15	44	70	59	37	225
Central Lincoln	0	0	1	11	23	34	45	22	136
Waldoboro	0	0	1	2	13	10	12	14	52
Mayo	0	6	42	104	68	69	89	121	499
North East Mobile Health Services	0	0	0	0	2	2	3	1	8
NorthStar	0	0	12	4	3	6	5	12	42
Searsport	0	0	0	52	29	6	19	16	122
St. George	0	0	0	57	25	13	2	2	99
United Ambulance	0	17	112	166	214	194	285	278	1266
TOTALS	**15**	**33**	**206**	**463**	**458**	**459**	**548**	**522**	**2704**

readmissions, the evaluation team obtained data from the Maine Health Data Organization (MHDO) for calendar year 2013 data regarding the number of hospital admissions (for any reason), length of stay, and total amount paid by Medicare (facility cost only) (Appendix D). We used the Medicare data since the majority of the CP population served across the pilot sites are Medicare eligible. The MHDO data can be used in a cost-avoidance formula by each CP pilot site where they plug in the number of patients and transports avoided specific to their project.

The general cost-avoidance formula (Figure 4) was developed by the MedStar Mobile Healthcare team in Fort Worth, Texas. Essentially, their data analysis reporting looks at the cost or the amount paid for delivering the service and the expenditure or the amount paid for the service provided. Thus, the general cost-avoidance formula can be calculated as below (Figures 4 and 5).

Figure 4. Cost-Avoidance Formula

Cost Avoided per patient = $\frac{(C_A+C_{ED})*TA}{P}$

- $C_A + C_{ED}$: Average Transport Cost (Ambulance Cost + ED Cost)
- TA: Number of Transports Avoided (This number is determined by the CP pilot site)
- P: Number of Patients Enrolled

Example:

$(\$367.04 + \$492.54) * 52$ transports avoided = **$44,698.16 total savings**

$\frac{(\$367.04+\$492.54)*52 \text{ transports avoided}}{121 \text{ patients enrolled}}$ = $369.41 savings per patient

To calculate the cost savings for preventing hospital readmissions, the general formula looks at the average hospital readmission cost and the number of transports avoided.

Figure 5. Cost-Avoidance Formula for Hospital Readmissions

Cost Avoided per patient = $\frac{(C_{RA})*TA}{P}$

- C_{RA}: Average Hospital Readmission Cost
- TA: Number of Transports Avoided (This number is determined by the CP pilot site)
- P: Number of Patients Enrolled

Example:

$\$3,476 * 52$ transports avoided=$180,752 estimated total savings

$\frac{\$3476 * 52 \text{ transports avoided}}{121 \text{ patients enrolled}}$ = $1,494 average savings per patient

Using MHDO data for calendar year 2013, the following formula is used to calculate the average cost per admission:

Total Paid by Medicare (Facility costs only) ÷ Number of Admits

Example for CMMC: $9,993,169 ÷ 2875 = $3,476

To calculate the **average daily cost:**

Use the total from above ÷ Average Length of Stay

Example: $3,476 ÷ 4 = $869

See Appendix D for the chart of MHDO data applicable to the Maine CP Pilot sites.

The evaluation team also developed a worksheet to help determine site-specific costs of providing a community paramedicine program. This worksheet was sent to each of the 12 CP pilot sites, requesting the following information:

- Personnel costs, including number of community paramedics, hourly rate, benefits, and number of visits per week

- Administrative costs, including the personnel costs of the supervisor/chief

- Training costs, including curriculum costs, registration fees, honorariums for trainers, and staff time in terms of number of hours/week, number of weeks for each staff trained

- Operational costs, including vehicle costs, medical supplies, and average cost for ambulance transport

The evaluation team also asked the pilot sites to give us their average ambulance reimbursement from CMS as a way to start to populate the cost-avoidance formula for each site. See Appendix E for the cost worksheet template.

Although we received responses from all 12 CP pilot sites, many of the answers were incomplete and we were not able to formulate overall cost savings for each site. This information, when fully collected, would be valuable to each community paramedicine pilot project as a way to both budget for the service and market it to the community. Additionally, this information, along with a robust and detailed data collection plan, would be beneficial as part of each new CP pilot project. To evaluate cost savings in a more rigorous manner, a study needs to be conducted which compares a control group of non-CP enrolled patients against those enrolled in a CP project over a period of time.

FUNDING

As mentioned earlier, all CP pilot sites were responsible for funding their project; no grant funding was provided by the Maine EMS or from any sources. The municipal-based EMS agencies (Calais, Castine, Searsport, Winthrop) currently have support for their CP services as part of their regular EMS budget from the town. Boothbay Regional Ambulance Service (BRAS) is a private, nonprofit service and whatever the shortfall is between the budget and their revenue is what they request from the town for subsidy. So it becomes a town budgetary issue as to whether or not they will fund that subsidy.

For those ambulance services that are hospital-owned (CA Dean, Crown, Mayo, NorthStar), the hospitals absorbed some or most of the cost of providing the community paramedic service. The CEOs at these hospitals see it as a service that fills a gap in the continuity of care, that they believe reduces the number of ER visits and hospital readmissions. In Searsport, the local hospital and clinic have helped stock supplies for the blood draws and blood glucose conducted by the CPs. The Director of Development at Lincoln County Healthcare is looking into grant funding that could be used in part to focus the CP program on hospital readmission avoidance. More than one hospital administrator said that it was the right thing to do for the patient. However, Mayo raised the question of whether they could continue to fully subsidize the CP program if, in their opinion, the changes at the state level continue to cut the hospital funding. The CEO of C.A. Dean Hospital emphasized that they are picking up the cost of the CP program with no revenue stream because “we do believe it has value and we will equate that to any runs or basic situations where they don’t end

Photograph by Sue Mello, Boothbay Register

up in a police car, emergency room or ambulance just because of the proactive nature [of the CP program]."

Despite the hospital subsidy for a few of the CP pilot sites, all have had to absorb a portion of the overall cost of the program into their operating budget. In the case of Boothbay Regional Ambulance Service (BRAS), which is part of the Lincoln County Healthcare CP pilot project, a bequest from a summer resident provided a one-year grant to the community, that according to the grant application, provided an "innovative healthcare project that advances healthcare, meeting the needs of the community in unique ways." The EMS chief at BRAS applied and they were awarded $63,000. They used this to purchase a response vehicle to take to CP visits (instead of the ambulance) and to help offset payroll expenses for the program for a year. Since it was just a one-time source of funding, BRAS anticipates that they will make the cost of the CP program part of their operating budget.

Crown Ambulance, which is owned by TAMC, notes that the ACO physician group is very supportive of the CP program in terms of referring patients, but Crown doesn't have the necessary resources "to provide that level of care they would like from us." The ACO has not provided any financial support for the CP program. However, a couple of the doctors used personal funds to set up a scholarship program for CP training as a measure of support for the program.

CHALLENGES

While the CP pilot program achieved many successes there were some challenges. Among the challenges voiced by several CP pilots were the following:

1. Lack of reimbursement for services.
Reimbursement for services provided by CPs is a challenge to workflow and program sustainability. Most of the sites noted that they provide the CP services at a cost to their EMS agency for their time/salary and EMS equipment. Also, trying to fit the CP visits into their duty roster is a challenge for many.

2. MEMSRR system not designed for CP. Although the MEMSRR system was modified to accommodate the CP pilot sites, many sites have found it to be a troublesome and cumbersome data collection tool for CP purposes. Most sites expressed frustration at not being able either enter data appropriately or utilize that data once entered to produce reports that can show success with patient progress and with the CP project.

3. Lack of physician buy-in of the CP concept. As mentioned in the Stakeholders/Partners section, one of the more commonly reported challenges concerned lack of buy-in from the physicians and hospitals regarding referrals to the CP. Some physicians do not yet see the CPs as extensions of their services to their patients in the community—to be their "eyes and ears" as many described their CP role.

4. Lack of cost data. Despite efforts by the evaluation team to gather cost figures reliable cost data were not available.

5. The evaluation was set up after the pilots started. A more robust evaluation, one that would have yielded even more useful data, would have been designed at the outset of the pilot program. As it was, the Muskie School began its evaluation mid-way through the three year pilot long after many sites had started their programs and developed their own data collection routines.

6. Limited technical assistance. In the first year of the pilot project, Maine EMS (MEMS) contracted with two EMS providers to offer technical assistance to the pilots. After this arrangement ceased, the MEMS provided only limited guidance to the sites. While the sites appreciated the latitude, they were not always clear on MEMS' expectations. According to the interviews with CP pilot sites, they could have used additional training on the overall concept of community paramedicine, staff training, and data collection.

7. Lack of patient satisfaction surveys. Almost all sites planned to administer a patient satisfaction survey. None were successful with survey administration at the time of interview, but many were very interested in implementing one and just need suggestions for questions.

8. Staffing issues. Buy-in from the paramedics was also noted as a challenge, which was alluded to in the section on staffing; some paramedics and EMTs do not see themselves as working within the framework of home visits to prevent readmissions, nor willing to undertake an extensive CP training curriculum.

New legislation which allows additional pilot sites and also including a change in the language concerning the PCP referral should more adequately reflect the flow in the delivery of healthcare services between the hospital, EMS, PCP, and the patient.

SUCCESSES

While the state Community Paramedicine Pilot program has not yet come to its 3-year conclusion, there are several success stories that can be highlighted at this point. Although anecdotal, these successes point to community collaboration, patient engagement, and trust that the various EMS agencies have developed as part of their CP pilot programs. Among the key successes are:

1. Number of CP runs in excess of 2,700 runs. In FY14, the 12 pilot sites made 717 CP runs. In FY15, the number of CP runs increased to 1,987 or 177.1%.

2. Referral system put in place at most CP pilot sites. Many CP pilot sites have forged referral processes with area primary care and emergency department physicians.

3. CP Pilot sites have initiated process flow diagrams. Many sites have mapped out in detail how CP runs progress from referral to completion.

4. Pilot sites have developed sustainable staffing plans. Many CP pilot sites have developed staffing plans that makes use of existing of EMT and/or paramedics.

5. Training CPs in Maine has happened both internally and externally. Some sites are handling training in-house by having their medical director or area medical providers deliver training. Other pilots have opted to have their CPs take online training through national CP programs, such as North Central EMS Institute's Community Paramedic curriculum. Both Hennepin County Technical College (MN) and the Colorado Mountain College programs are based on the North Central EMS Institute curriculum, which specifies both didactic and clinical training.

According to our interviews, community perception of the CP pilot programs tends to be very positive and is credited by many of the pilot sites as a success. In terms of collaboration, Lincoln County Healthcare has a CP project group that meets regularly and includes the staff from the three EMS agencies, the home health agency, the Care Transition Nurse at Lincoln Medical Partners, the Chief Medical Officer of Lincoln County Healthcare, and two emergency physicians. They all note that collaboration with home health has been instrumental in the success of their CP pilot project. Both the home health director and the Chief Medical Officer state that they have seen the benefits of using community paramedics to address their struggle with high rates of re-hospitalization.

Many of the pilot sites mentioned that medication reconciliation is a key service they provide that has prevented several patients from ending up in the ED or hospital. Elderly patients who have been recently discharged from the hospital with a new set of medications are often confused about what medications they need to continue, and the CPs help educate patients about their medications.

One of the medical directors for a CP pilot site who works with patients who are primarily elderly, chronically ill, and may have dementia, noted that the CPs fill in the gaps of primary care. The CPs also help keep tabs on those who may have transportation issues and would therefore miss lab appointments or office visits. Regarding the community paramedic program, the doctor notes: "The most valuable so far is getting to the patient that can't get in to the office; being able to adjust things that need to be adjusted without seeing them, because many don't come to the office even when they need to; being able to have an eye on the patient; getting labs before their office visit is really helpful."

SUSTAINABILITY

Regarding the continuation and sustainability of the Community Paramedicine pilot projects, only one of the 12 pilot sites thought that the program was unsustainable and most likely would not continue past the pilot stage. Several (5) were not sure, but were hopeful, and six (6) pilot sites said they would continue the CP program past the pilot stage. Organizational affiliation (whether the ambulance service is municipal/community, private, or hospital based) is, surprisingly, not the major driving force for the sustainability of the program. The six sites that indicated they would continue are equally divided across the organizational affiliations: three are municipal/community-based, one is a private service, and two are hospital-based. Hospital-based services generally derive operational benefit from the hospitals which absorb much of the cost of the program. However, of the five hospital-owned

According to our interviews, community perception of the CP pilot programs tends to be very positive and is credited by many of the pilot sites as a success.

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services, only two stated that the CEOs of their hospitals are very committed to the program.

Reimbursement for CP services is the major driving force for sustainability. Those CP pilot sites that were not sure of the sustainability of their program cited reimbursement and revenue streams as the tipping point. "Sustainability of the program beyond the pilot is very dependent on reimbursements" stated one of the CP Coordinators. Some also noted that if the program were to grow in CP call volume, the staffing configurations and logistics for the on-duty staff might become unwieldy, and funding would need to be secured to hire additional CPs.

For some of the municipal services, "internal vision coherence" is part of the sustainability issue. Municipalities will have to decide if "this is an EMS service doing CP or is it a health service that does EMS?" Raising this issue at the community level is part of the sustainability discussion.

LESSONS LEARNED

By the end of June 2015, the CP pilot sites had logged in excess of 2,700 CP runs. In FY15, the number of CP runs increased to 1,980 or 177.1% over the previous state fiscal year. While much of this increase is being driven by a small number of the pilot sites, CP activity across the state is beginning to pick up. Overall, the CP pilot program in Maine has highlighted the need for innovative solutions to integrated care coordination for patients with chronic conditions who are at high risk for unnecessary ED use and/or re-hospitalization.

Among the key lessons learned are the following:

1. Need for better data collection system. A more robust data statewide collection system would help the statewide CP pilot program track trends in the number of CP visits and types of CP services provided by current and future pilot sites. Many sites have found MEMSRR to be a troublesome and cumbersome data collection tool. Most sites expressed frustration at not being able either to enter data appropriately or utilize the data to

produce reports that can show patient progress. The inability to track repeat visits to the ER and repeat users of a CP service was a concern for more than one site. Some sites began using their own data collection and tracking systems for data reliability, including simple measures like leaving a notebook in the patient's home to be utilized by all care providers, and more sophisticated means such as alternative databases that could interface with the required reporting in MEMSRR. All the CP pilot sites would benefit from guidance from the Maine EMS or easy to use tools on what to collect and when.

2. Determine cost savings. Actual cost savings to the healthcare system are not possible to determine at the current time. The 12 pilot sites have saved their local communities resources and have demonstrated they can be an extension of the healthcare system by providing preventive services in the community. For the pilot sites to detail the actual cost savings they must collect detailed cost data (e.g. time spent on each run – travel and time onsite, services provided including laboratory specimens collected, training expenses, etc). More accurate cost information would be instructive as the pilot project is extended.

3. Develop patient satisfaction surveys. Some sites planned to administer a patient satisfaction survey. None had successfully done so at the time of interview, but indicated interest in implementing one. Similar to other data collection efforts mentioned above, having some patient satisfaction survey templates could be very helpful for the CP pilots. Additionally, Maine EMS could facilitate a dialogue or e-mail exchange among the sites on this subject.

4. Need for more dialogue with area primary care physicians and emergency room doctors. As noted in the Stakeholders/Partners section, some sites struggled with gaining area physician buy-in during the first year of the program. Marketing the CP pilot program is still a challenge for most EMS agencies. As a result, some of these sites were not able to secure as many referrals as expected well into the second year. In some cases, once primary care and emergency department physicians became more informed about the CP pilot program, the volume of referrals increased, reflecting physician buy-in. Maine EMS and CP pilot sites should discuss strategies for overcoming these obstacles.

5. Lack of resources to create a statewide CP infrastructure. As mentioned the CP pilots did not receive any state resources to carry out their projects. Maine EMS received only modest funds, through the Rural Health and Primary Care program's Flex allocation, to plan for the pilot. These scarce resources were not sufficient to develop the infrastructure to carry out this pilot project. Additionally, the individual pilot projects received little statewide training, and minimal technical assistance. Thus, as mentioned earlier in the report, the current data collection system is not ideal for community paramedicine.

The statewide pilot program can be considered a model for other potential Maine CP pilots as well as other states considering such a program. The lessons of these pilots provide opportunities for CP programs and Maine EMS to enhance the pilot program. With many of the lessons learned raised in this section, solutions are possible with guidance from Maine EMS and a healthy exchange among the pilot project sites.

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APPENDIX A

Interview Protocol for Community Paramedicine Phone Interviews 2015

Date of call:_____

Name of Community Paramedicine Pilot Project:_____
Name/Position of Interviewees:_____

Hello, my name is _____ and I am calling from the University of Southern Maine's Muskie School to talk with you about your Community Paramedicine Pilot Project.We have contracted with the State of Maine to evaluate the Community Paramedicine Pilot program overall as well as to describe the various implementation models and strategies used by the 12 individual pilot sites.

To that end, we are interviewing each pilot site's lead team members about their process for providing community paramedicine, data collection efforts, and progress to date. We anticipate that this call will last no longer than an hour. The results of our interviews will be summarized in a report to the Maine EMS and to the state Legislature. Because we wish to identify the participating community paramedicine projects in our report, we are asking if we have permission from you to identify your site. There is no expected risk to you for helping us with this study. There are no expected benefits to you either, other than that staff and programs may improve as a result of your impact. That being said, your participation is voluntary and this interview can be terminated at any time without consequence. We will provide you with the opportunity to review and comment on the summary notes from this interview as well as your pilot project's information to be included in our final report.

If you agree and we start talking and you decide you no longer want to do this, we can stop at any time. We will not identify you or use any information that would make it possible for anyone to identify you in any presentation or written reports about this study. If it is okay with you, we might want to use direct quotes from you, but these would only be cited as from a person (or if person has a specific label or title, it might be used). Do you still want to talk with us?

If you have any questions or concerns about your rights as a research subject, you may call the USM Human Protections Administrator at (207) 228-8434 and/or email usmirb@usm.maine.edu. You can confirm the authenticity of the study by calling the University of Southern Maine's Muskie School of Public Service at 780-5843.

Brief description of the CP project from application, noting intended goals.
Is this still accurate?
If not, please describe the changes.

PROBES:
What is the geographic service area?
What are the current goals of the project?
How do they differ from your intent when the project first started/conceived.
What types of services do the community paramedics currently provide? Is this different than what was previously intended/indicated in their grant application?

Please describe the process of a Community Paramedicine event

PROBES:
How are the patients enrolled?
Who initiates the visit order?
Do you have a flow chart? A checklist?
Do you use referral documents?
If yes, did you develop them in-house or use an external resource? (If so, name that source)
Any other tools you use to track the event?

DATA COLLECTION EFFORTS

What specific measures will define success of your project?

PROBES:
How will you know your project is on track to achieve the results desired?

What data elements are you collecting?

PROBES:
Have them itemize the data elements
Can they send us their data collection forms? (templates, de-identified)

How do you report your data?

PROBES:
Electronically?
As part of the Run Report?
Separate upload to…?

To whom do you report your data?

PROBE:
What types of feedback on your data do you get from the State?
How is your data stored?

Do you conduct satisfaction surveys? If yes, how? If no, do you plan to?

PROBE:
Patient?
Provider?
Can they send us the survey protocol?

STAFFING

How many Community Paramedics do you have? (FTE)

Are they volunteer or paid?

What level paramedic do you use for your Community Paramedicine project?

PROBES:
What kind of training is provided for the community paramedic?

Please describe the role of the Medical Director in your project

PROBES:
Full or part time?
Method of communication
Supervisory function
Does he/she do chart reviews?
Is he/she affiliated with the local hospital?

Please describe the role of the Primary Care Physician (PCP)

PROBES:
Referral process/requirement
Full or part time?
Method of communication
Supervisory function

STAKEHOLDER/PARTNER INVOLVEMENT

Please describe the partnerships or collaborative arrangements in the community that are part of your Community Paramedicine project.

PROBES:
Stakeholder/partner involvement in development of project
Ongoing stakeholder/partner involvement
Did you conduct a community needs assessment? If so, who conducted it?
What is your affiliation with the local nursing home/assisted living?
Describe your interaction with Home Health
What local and/or governmental agencies are involved in the project?
What local social service agencies are involved in the project?
How have you reached out to the community to inform/educate them about your Community Paramedicine project?

REIMBURSEMENT/FUNDING

Please describe the reimbursement or funding mechanisms currently in place to operate your Community Paramedicine project

Please describe your strategies to provide continued funding for this project (sustainability)

What are some of the barriers you have encountered regarding reimbursement/funding?
What are the strategies you have used or are using to overcome these barriers?

SUSTAINABILITY

What are the key factors that will make this program sustainable?

PROBES:
Finances (Support base, fiscal trends, events, other factors)
Leadership (Internal change agents, recent/anticipated departures of key personnel, gaps in capacity)
Program achievement (How will you know your project is on track to achieve the results desired?)

IMPLEMENTATION CHALLENGES AND SUCCESSES

Please tell us about the challenges you encountered in the development of this project, and how you have overcome them.

PROBES:
Community perception
Community outreach
Internal logistics
Funding
Other "red tape" issues

Please tell us about successes you have achieved in the development of this project and what factors contributed to those successes.

Please tell us about successes you have achieved in the implementation of this project and what factors contributed to those successes.

LESSONS LEARNED

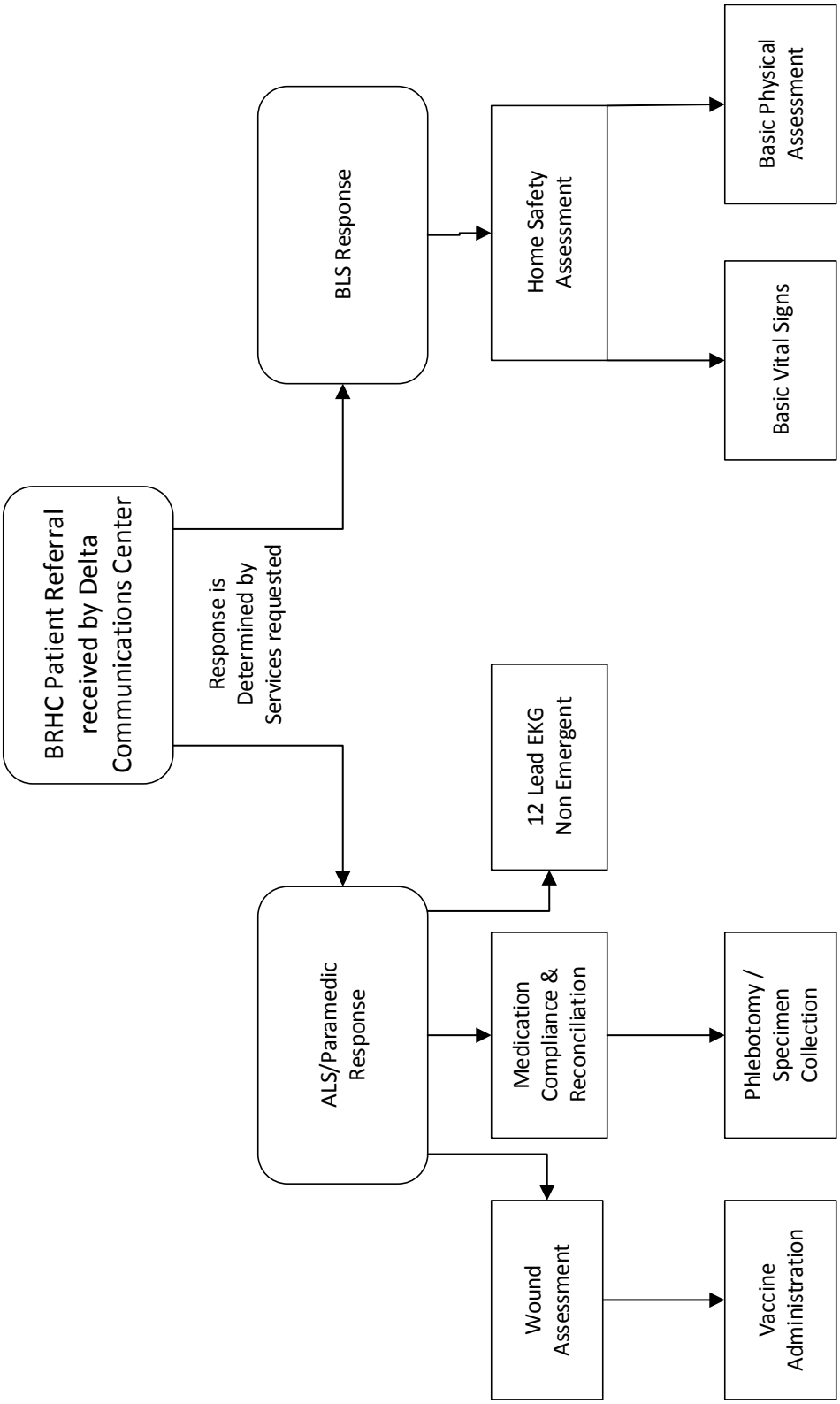
What advice would you give to someone interested in implementing a similar program?

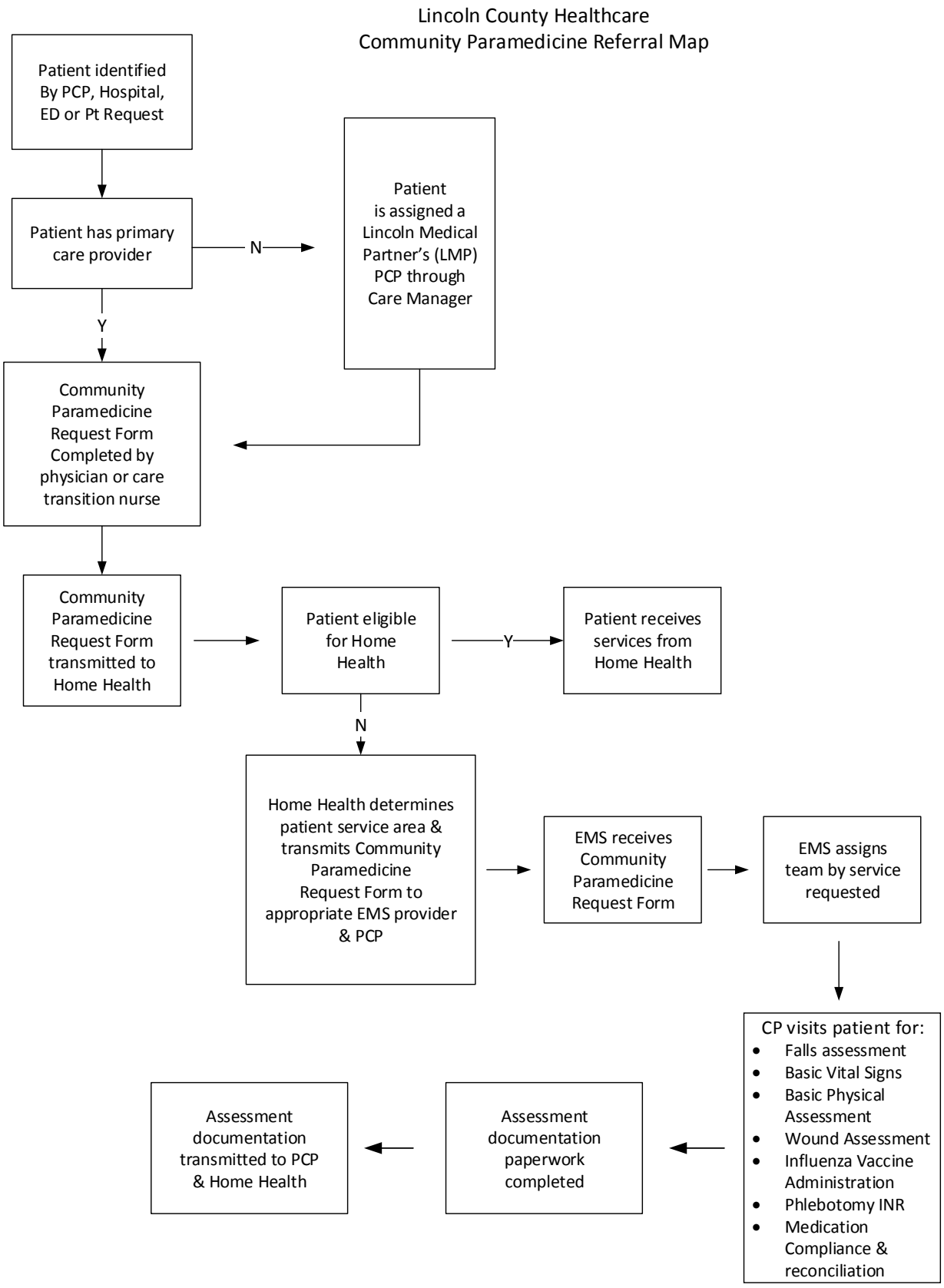
Thank you for taking time out of your busy schedules to talk with us. Please send us any written documents you are using (forms, de-identified spreadsheets, tracking tools, presentations to community organizations or hospital boards, etc.); you can email them to Karen Pearson, the Principal Investigator, at karenp@usm.maine.edu

Also, please don't hesitate to contact us if you have questions or additional comments.

APPENDIX B

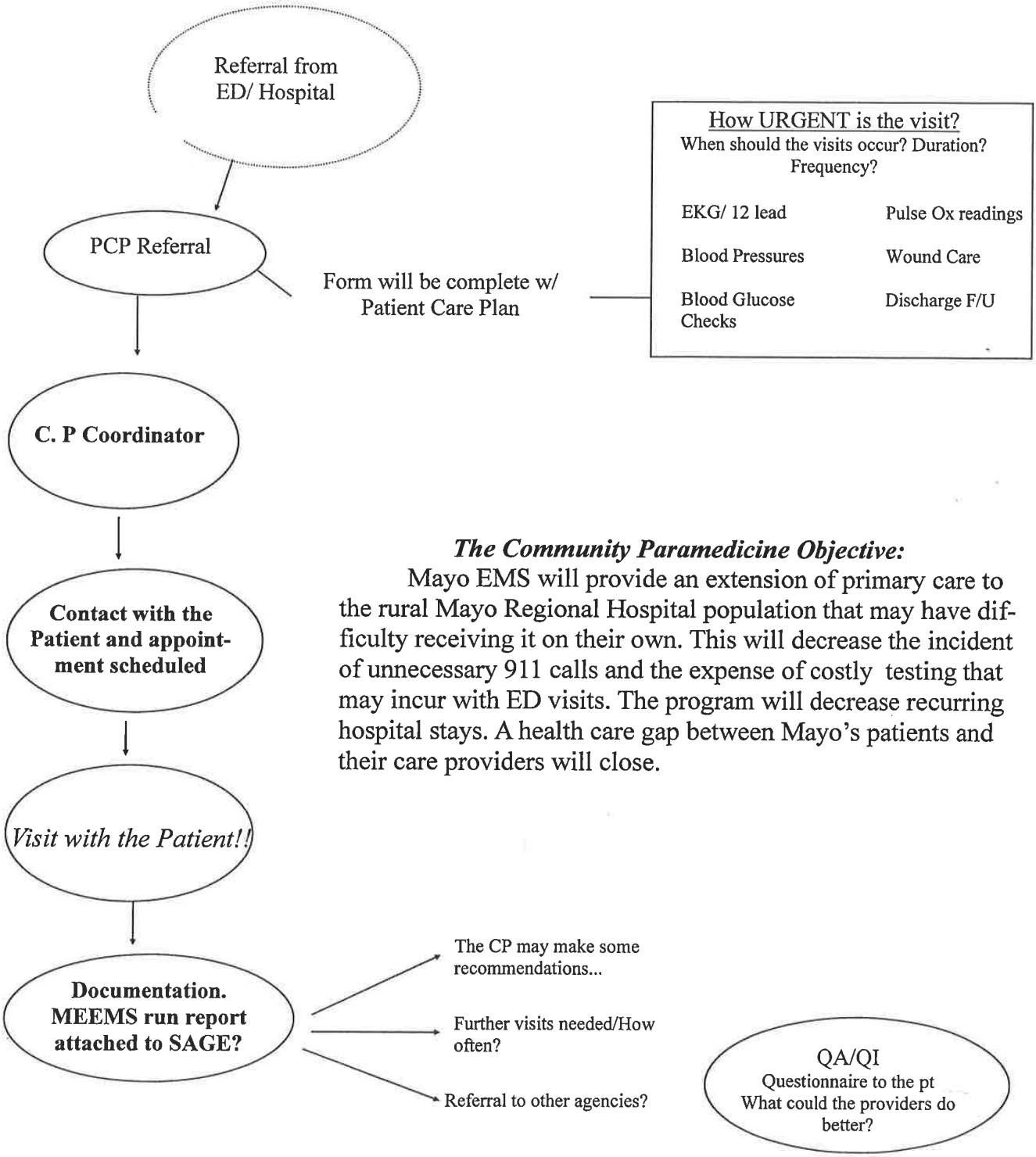
Delta Community Paramedic Referral Dispatch Protocol




Lincoln County Healthcare
Community Paramedicine Referral Map
Patient identified By PCP, Hospital, ED or Pt Request
Patient has primary care provider
N
Patient is assigned a Lincoln Medical Partner's (LMP) PCP through Care Manager
Y
Community Paramedicine Request Form Completed by physician or care transition nurse
Community Paramedicine Request Form transmitted to Home Health
Patient eligible for Home Health
Y
Patient receives services from Home Health
N
Home Health determines patient service area & transmits Community Paramedicine Request Form to appropriate EMS provider & PCP
EMS receives Community Paramedicine Request Form
EMS assigns team by service requested
CP visits patient for:
Falls assessment
Basic Vital Signs
Basic Physical Assessment
Wound Assessment
Influenza Vaccine Administration
Phlebotomy INR
Medication Compliance & reconciliation
Assessment documentation paperwork completed
Assessment documentation transmitted to PCP & Home Health

MAYO REGIONAL HOSPITAL

Community Paramedicine Program Flow Chart



The Community Paramedicine Objective:

Mayo EMS will provide an extension of primary care to the rural Mayo Regional Hospital population that may have difficulty receiving it on their own. This will decrease the incident of unnecessary 911 calls and the expense of costly testing that may incur with ED visits. The program will decrease recurring hospital stays. A health care gap between Mayo's patients and their care providers will close.

Mobile Integrated Healthcare Program

Measurement Strategy Overview

Aim

A clearly articulated goal statement that describes how much improvement by when and links all the specific outcome measures; what are we trying to accomplish?

Develop a uniform set of measures which leads to the optimum sustainability and utilization of patient centered, mobile resources in the out-of hospital environment and achieves the Triple Aim® — improve the quality and experience of care; improve the health of populations; and reduce per capita cost.

Measures Definition:

1. **Core Measures (BOLD)**
   a. Measures that are considered *essential* for program integrity, patient safety and outcome demonstration.

2. **CMMI Big Four Measures (RED)**
   a. Measures that have been identified by the CMS Center for Medicare and Medicaid Improvement (CMMI) as the four primary outcome measures for healthcare utilization.

3. **MIH Big Four Measures (PURPLE)**
   a. Measures that are considered *mandatory* to be reported in order to classify the program as a bona-fide MIH or Community Paramedic program.

4. **Top 17 Measures (Isolated)**
   a. The 17 measures identified by operating MIH/CP programs as essential, collectable and highest priority to healthcare partners.
   b. These measures are isolated in this document for ease of reference.

Notes:

1. All financial calculations are based on the ***national average Medicare payment*** for the intervention described. Providers are encouraged to also determine the ***regional average Medicare payment*** for the interventions described.
2. Value may also be determined by local stakeholders in different ways such as reduced opportunity cost, enhanced availability of resources. Program sponsors should develop local measures to demonstrate this value as well.

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Measure Categories

Structure: Describes the acquisition of physical materials and development of system infrastructures needed to execute the service (Rand). For example:

- Community Health Needs Assessment
- Community Resource Capacity Assessment
- Executive Sponsorship, Strategic Plan & Program Launch Milestones
- Organizational Readiness Assessment – Health Information Technology Systems
- Organizational Readiness Assessment – Medical Oversight
- Plan for Integration with Healthcare, Social Services and Public Safety Systems

Outcomes: Describes how the system impacts the values of patients, their health and wellbeing (IHI). For example:

Quality of Care Metrics

- Patient Safety
- Care Plan Acceptance and Adherence
- Medical Home
- Medication Inventories

Utilization Metrics

- All-cause Hospital Admissions
- Emergency Department Visits
- Unplanned 30-day Hospital Readmissions

Cost of Care Metrics

- Expenditure Savings by Intervention

Experience of Care Metrics

- Patient Quality of Life
- Patient Satisfaction

Definitions: Throughout the document, hyperlinks for certain defined terms are included.

Balancing: Describes how changes designed to improve one part of the system are impacting other parts of the system, such as, impacts on other stakeholders such as payers, employees, or community partners (IHI). For example:

- Partner (healthcare, behavior health, public safety, community) satisfaction
- Practitioner (EMS/MIH) satisfaction
- Public and stakeholder engagement
- PCP and other healthcare utilization

Process: Describes the status of fundamental activities associated with the service; describes how the components in the system are performing; describes progress towards improvement goals (Rand/IHI). For example:

- Clinical & Operational Metrics
- Referral & Enrollment Metrics
- Volume of Contacts, Visits, Transports, Readmissions

Structure/Program Design Measures

Describes the development of system infrastructures and the acquisition of physical materials necessary to successfully execute the program

Name	Description of Goal	Components	Scoring	Evidence-base, Source of Data
Specialized Training & Education	**S10:** Specialized original and continuing education for community paramedic practitioners	A specialized educational program has been used to provide foundational knowledge for community paramedic practitioners based on a nationally recognized or state approved curriculum.	0. Not known 1. There is no specialized education offered. 2. There is specialized education offered, but it lacks key elements of instruction. 3. There is specialized education offered meeting or exceeding a nationally recognized or state approved curriculum.	North Central EMS Institute Community Paramedic Curriculum or equivalent.

Outcome Measures for Community Paramedic Program Component

Describes how the system impacts the values of patients, their health and well-being

Domain	Name	Description of Goal	Value 1	Value 2	Formula	Evidence-base, Source of Data
Quality of Care & Patient Safety Metrics	**Q1:** Primary Care Utilization	Increase the number and percent of patients *utilizing* a Primary Care Provider (if none upon enrollment)	Number of enrolled patients with an established PCP relationship upon graduation	Number of enrolled patients without an established PCP relationship upon enrollment	Value 1 Value 1/Value 2	Agency records
	Q2: Medication Inventory	Increase the number and percent of medication inventories conducted with issues identified and communicated to PCP	Number of medication inventories with issues identified and communicated to PCP	Number of medication inventories completed	Value 1 Value 1/Value 2	Agency records
	Q5: Unplanned Acute Care Utilization (e.g.: emergency ambulance response, urgent ED visit)	Minimize rate of patients who require unplanned acute care related to the CP care plan within 6 hours after a CP intervention	Number of patients who require unplanned acute care related to the CP care plan within 6 hours after a CP intervention	All CP visits in which a referral to Acute Care was NOT recommended	Value 1/Value 2	Agency records

Domain	Name	Description of Goal	Value 1	Value 2	Formula	Evidence-base, Source of Data
Experience of Care Metrics	**E1:** Patient Satisfaction	Optimize patient satisfaction scores by intervention.	To be determined based on tools developed	To be determined based on tools developed		Recommend an externally administered and nationally adopted tool, such as, HCAPHS; Home Healthcare CAPHS (HHCAPHS)
	E2: Patient Quality of Life	Improve patient self-reported quality of life scores.	To be determined based on tools developed	To be determined based on tools developed		Recommended tools (EuroQol EQ-5D-5L, CDC HRQoL, University of Nevada-Reno)

Domain	Name	Description of Goal	Value 1	Value 2	Formula	Notes
Utilization Metrics	**U1:** Ambulance Transports	Reduce rate of unplanned ambulance transports to an ED by *enrolled patients*	Number of *unplanned* ambulance transports up to 12 months post-graduation	Number of *unplanned* ambulance transports up to 12 months pre-enrollment	(Value 1-Value 2)/Value 2	Monthly run chart reporting and/or pre-post intervention comparison
	U2: Hospital ED Visits	Reduce rate of ED visits by *enrolled patients* by intervention	ED visits up to 12 months post-graduation	ED visits up to 12 months pre-enrollment	(Value 1-Value 2)/Value 2	Monthly run chart reporting and/or pre-post intervention comparison
			OR Number of ED Visits avoided in CP intervention patient		Value 1	
	U3: All - cause Hospital Admissions	Reduce rate of all-cause hospital admissions by *enrolled patients* by intervention	Number of hospital admissions up to 12 months post-graduation	Number of hospital admissions up to 12 months pre-enrollment	(Value 1-Value 2)/Value 2	Monthly run chart reporting and/or pre-post intervention comparison
	U4: Unplanned 30-day Hospital Readmissions	Reduce rate of all-cause, unplanned, 30-day hospital readmissions by *enrolled patients* by intervention	Number of actual 30-day readmissions	Number of anticipated 30-day readmissions	(Value 1-Value 2)/Value 2	Monthly run chart reporting and/or pre-post intervention comparison

Domain	Name	Description of Goal	Value 1	Value 2	Formula	Evidence-base, Source of Data
Cost of Care Metrics -- Expenditure Savings	**C1: Ambulance Transport Savings (ATS)**	Reduce Expenditures for unplanned ambulance transports to an ED *pre and post enrollment or per event*	Ambulance transport utilization change in measure period X average payment per transport for enrolled patients MINUS Expenditure per CP patient contact	Number of patients enrolled in the CP program	Value 1 / Value 2	Monthly run chart reporting and/or pre-post intervention comparison CMS Public Use Files (PUF) for ambulance supplier expenditures or locally derived number
	C2: Hospital ED Visit Savings (HEDS)	Reduce expenditures for ED visits *pre and post enrollment or per event*	ED utilization change in measure period X average payment per ED visit for enrolled patients MINUS Expenditure per CP patient contact	Number of patients enrolled in the CP program	Value 1/ Value 2	Monthly run chart reporting and/or pre-post intervention comparison Medical Expenditure Panel Survey (MEPS), or individually derived payer data
	C3: All-cause Hospital Admission Savings (ACHAS)	Reduce expenditures for all-cause hospital admissions *pre and post enrollment or per event*	Hospital admission change in measure period X average payment per admission for enrolled patients MINUS Expenditure per CP patient contact	Number of patients enrolled in the CP program	Value 1/ Value 2	Monthly run chart reporting and/or pre-post intervention comparison Medical Expenditure Panel Survey (MEPS), or individually derived payer data

Domain	Name	Description of Goal	Value 1	Value 2	Formula	Evidence-base, Source of Data
	C6: Total Expenditure Savings	Total expenditure savings for all CP interventions	Individual savings for each enrollee (ATS+HEDS + (ACHAS or UHRS)+USNFS)) MINUS the Cost of CP interventions for intervention per enrollee, including alternative sources of care expenditures		Sum of Value 1	Monthly run chart reporting and/or pre-post intervention comparison
Balancing Metrics	**B1:** Practitioner (EMS/MIH) Satisfaction **Desirable Measure**	Optimize practitioner satisfaction scores	To be determined based on tools developed			Recommend externally administered
	B2: Partner Satisfaction **Desirable Measure**	Optimize partner (healthcare, behavior health, public safety, community) satisfaction scores	To be determined based on tools developed			Recommend externally administered
	B3: Primary Care Provider (PCP) Use	Optimize Number of PCP visits resulting from program referrals during enrollment	Number of PCP visits during enrollment		Value 1	Network provider or patient reported

Definitions

Specific Metric Definitions:

Expenditure: The amount ***PAID*** for the referenced service. Expenditures should generally be based on the national and regional amounts paid by Medicare for the covered services provided.

Examples:

Service	Cost to Provide the Service by the Provider	Amount Charged (*billed*) by the Provider	Average Amount Paid by Medicare
Ambulance Transport	$350	$1,500	**$420**
ED Visit	$500	$2,000	**$969**
PCP Office Visit	$85	$199	**$218**

National CMS Expenditure by Service Type:

Service	Average Expenditure	Source
Emergency Ambulance Transport	$419	Medicare Tables from CY 2012 as published
ED Visit	$969	http://www.cdc.gov/nchs/data/hus/hus12.pdf
PCP Office Visit	$218	http://meps.ahrq.gov/data_files/publications/st381/stat381.pdf
Hospital Admission	$10,500	http://www.hcup-us.ahrq.gov/reports/projections/2013-01.pdf

Triple Aim

- Improve the quality and experience of care
- Improve the health of populations
- Reduce per capita cost

Driver Diagram: A Driver Diagram is a strong one-page conceptual model which describes the projects' theory of change and action. It is a central organizing element of the operations/implementation plan and includes the aim of the project and its goals, measures, primary drivers and secondary drivers. The aim statement describes what is to be accomplished, by how much, by when and where?

- Aim – A clearly articulated goal statement that describes how much improvement by when and links all the specific measures. What are we trying to accomplish? CMMI/IHI.
- Primary Drivers – System components that contribute directly to achieving the aim; each primary driver is linked to clearly defined outcome measure(s). CMMI.
- Secondary Drivers – Actions necessary to achieve the primary driver; each secondary driver is linked to clearly defined process measure(s). CMMI.

General Definitions

- *Adverse Outcome*: Death, temporary and/or permanent disability requiring intervention
- *All Cause Hospital Admission:* Admission to an acute care hospital for any admission DRG
- *Average Length of Stay:* The average duration, measured in days, of an in-patient admission to an acute care, long term care, or skilled nursing facility
- *Care Plan*: A written plan that addresses the medical and psychosocial needs of an enrolled patient that has been agreed to by the patient and the patient's primary care provider
- *Case Management Services*: Care coordination activities provided by another social service agency, health insurance payer, or other organization.
- *Core Measure*: Required measurement for reporting on MIH-CP services
- *Critical Care Unit Admissions or Deaths*: Admission to critical care unit within 48 hours of CP intervention; unexpected (non-hospice) patient death within 48 hours of CP visit
- *Desirable Metric*: Optional measurement
- *Enrolled Patient*: A patient who is enrolled with the EMS/MIH program through either; 1) a 9-1-1 or 10-digit call; or 2) a formal referral and enrollment process.
- *Evaluation*: determination of merit using standard criteria
- *Financial Sustainability Plan*: a document that describes the expected revenue and/or the economic model used to sustain the program.
- *Guideline*: a statement, policy or procedure to determine course of action
- *Hotspotter/ High Utilizers*: Any patient utilizing EMS or ED services 12 times in a 12 month period, or as defined by local program goals.
- *Measure*: dimension, quantity or capacity compared to a standard
- *Medication Inventory*: The process of creating the most accurate list possible of all medications a patient is taking — including drug name, dosage, frequency, and route — and comparing that list against the physician's admission, transfer, and/or discharge orders, with the goal of providing correct medications to the patient at all transition points within the hospital.
- *Metric*: a standard of measurement
- *Payer Derived: measure that must be generated by a payer from their database of expenditures for a member patient*
- *Pre and Post Enrollment*: The beginning date and ending date of an enrolled patient.
- *Repatriation*: Returning a person to their original intended destination, such as an emergency department, following an intervention
- *Social & Environmental Hazards and Risks*: include trip/fall hazards, transportation, electricity, food, etc.
- *Standard*: criteria as basis for making a judgment
- *Unplanned*: Any service that is not part of a patient's plan of care.

APPENDIX D

Data Request 051587 - Muskie School of Public Service			
Calendar year 2013 Data			
Hospital	Number of Admits	Average Length of Stay	Total Paid by Medicare (Facility costs only)
AR Gould Memorial Hospital	1,127	5	$5,667,178
Blue Hill Memorial Hospital	493	5	$2,746,028
CA Dean Memorial Hospital	56	21	$340,540
Calais Regional Hospital	541	5	$4,186,970
Central Maine Medical Center	2,875	4	$9,993,169
Franklin Memorial	917	4	$5,586,623
Inland Hospital (Waterville)	527	4	$2,536,207
Maine Coast Memorial Hospital	1,144	3	$4,233,844
MaineGeneral	2,956	6	$13,641,812
Maine Medical Center	6,395	5	$21,070,107
Mayo Regional	667	4	$3,861,999
Mercy Hospital	1,855	4	$8,638,550
Miles Memorial	810	6	$2,958,711
Pen Bay Medical Center	1,720	9	$8,830,753
St. Andrews	221	4	$825,323
St. Mary's Regional Health Center (Lewiston)	1,498	5	$6,090,245
TAMC	126	29	$591,796
Waldo County General	624	4	$4,544,543
Source: Medicare inpatient facility claims incurred during calendar year 2013 paid directly by Medicare.			
Note: Hospital totals reported here represent all inpatient Medicare facility claims for any of the billing entities associated with the reporting entity. These relationships are shown on the "Entity Grouping" worksheet.			
Prepared by the Maine Health Data Organization			
Jun-15			

Community Paramedicine Cost Worksheet

NAME OF COMMUNITY PARAMEDICINE PILOT PROJECT:								
Contact (name, email, and phone #):								
Personnel Costs	Hourly rate	Benefits	Number Visits per week					
Number of Community Paramedics: ___								
CP 1								
CP 2								
CP 3								
CP 4								
CP 5								
Administrative Costs (list hours per week, $ per hour, # of weeks)								
Training Costs	# hours/week	$ per hour	# weeks	# staff				
Staff time (list # of hours/week, $ per hour, # of weeks for each staff trained)								
Curriculum costs (total $ cost)								
Registration fees (total $ cost)								
Honorariums for trainers (total $ cost)								
Operational Costs								
Vehicle cost: list $ per mile, average # miles per visit								
Total cost can include fuel & depreciation and medical supplies								
Charge for ambulance transport:								
Reimbursement rates								
Ambulance transport (reimbursed by Medicare):								

SKILLS
PROGRAMS
KNOWLEDGE
RURAL
DIABETES
Community
Paramedic
vitals
Medical Director
EMS
Pre-hospital
HOME
VISIT
VACCINE
CHRONIC
DISEASE
MANAGEMENT
PREVENTION
MAINE
ASSESS
HOSPITAL
AVOIDANCE
TENANTS HARBOR
WOUND CARE
CERTIFIED
HOME VISIT
TRAINING
EDEMA
STAFFING
COST
TREAT
EDUCATE
PROGRAMS
COPD
DAMARISCOTTA
SCARBOROUGH
OLD ORCHARD BEACH
BOOTHBAY
MEDICATION
RECONCILIATION
CASTINE
CALAIS
LEWISTON
PRESQUE ISLE
SEARSPORT
WALDOBORO
WINTHROP
GREENVILLE
FARMINGTON
DOVER-FOXCROFT