Prehospital Emergency Care

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/ipec20

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To cite this article: Catherine C. Quatman-Yates, David Wisner, Mark Weade, Mindy Gabriel, Jessica M. Wiseman, Elizabeth Sheridan, Jennifer H. Garvin, John F. P. Bridges, Heena P. Santry, Ashish R. Panchal, Soledad Fernandez & Carmen E. Quatman (2021): Assessment of Fall-Related Emergency Medical Service Calls and Transports after a Community-Level Fall-Prevention Initiative, Prehospital Emergency Care, DOI: 10.1080/10903127.2021.1922556

To link to this article: https://doi.org/10.1080/10903127.2021.1922556

Published online: 27 May 2021.

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Received January 5, 2021 from School of Health and Rehabilitation Sciences, The Ohio State University, Columbus, Ohio (CCQ-Y); Chronic Brain Injury Program, The Ohio State University, Columbus, Ohio (CCQ-Y); Sports Medicine Research Institute, The Ohio State University, Columbus, Ohio (CCQ-Y); Upper Arlington Fire Division, Upper Arlington, Ohio (DW, MW); Westerville Division of Fire, Westerville, Ohio (MG); Department of Orthopaedics, The Ohio State University, Columbus, Ohio (JMW, ES, CEQ); Health Information Management and Systems, The Ohio State University, Columbus, Ohio (JHG); Department of Biomedical Informatics, The Ohio State University, Columbus, Ohio (JHG, JFPB, SF); Center for Surgical Health Assessment, Research, and Policy (SHARP), The Ohio State University Wexner Medical Center, Columbus, Ohio (JFPB, HPS, CEQ); Department of Surgery, The Ohio State University, Columbus, Ohio (HPS); Department of Emergency Surgery, The Ohio State University, Columbus, Ohio (ARP); Center for EMS, The Ohio State University, Columbus, Ohio (ARP). Revision received April 21, 2021; accepted for publication April 22, 2021.

The authors would like to thank the following for their contributions to this project: Dr. Anne Kloos, Christine Leyshon, Captain Christopher Moore, the Community FIT Collaborative, Dr. Deborah Kegelmeyer, Donald Dyche, Doug Brownfield, Jaclyn Krieger, Jason Cable, John Hamilton, Dr. Laura Phieffer, Chief Lyndon Nofziger, Chief Mark Zambito, Matt Jividen, Dr. Michele Basso, Dr. Phyllis Cummins, and the Upper Arlington Fire Division.

The authors have no relevant financial or nonfinancial competing interests to report for this project.

This work was supported by the Linda M. Cummins Simpson Research Endowment Fund for Mobility and AD; the National Institute on Aging under the GEMSSTAR (Grants for Early Medical and Surgical Subspecialists' Transition to Aging Research) grant (R03AG060177-02); The Ohio State University Office of Outreach and Engagement under the Connect and Collaborate Grant; and The Ohio State University College of Medicine and Center for Clinical & Translational Science under a Davis-Bremer Path to K award.

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doi:10.1080/10903127.2021.1922556

Abstract

Background: Getting effective fall prevention into the homes of medically and physically vulnerable individuals is a critical public health challenge. Community paramedicine is emerging globally as a new model of care that allows emergency medical service units to evaluate and treat patients in non-emergency contexts for prevention efforts and chronic care management. The promise of community paramedicine as a delivery system for fall prevention that scales to community-level improvements in outcomes is compelling but untested. **Objective:** To study the impact of a community paramedic program's optimization of a fall prevention system entailing a clinical pathway and learning health system (called Community-FIT) on community-level fall-related emergency medical service utilization rates. **Methods:** We used an implementation science framework and quality improvement methods to design and optimize a fall prevention model of care that can be embedded within community paramedic operations. The model was implemented and optimized in an emergency medical service agency servicing a Midwestern city in the United States (~35,000 residents). Primary outcome measures included relative risk reduction in the number of community-level fall-related 9-1-1 calls and fall-related hospital transports. Interrupted time series analysis was used to evaluate relative risk reduction from a 12-month baseline period (September 2016 - August 2017) to a 12-month post-implementation period (September 2018–August 2019). **Results:** Community paramedic home visits increased from 25 in 2017, to 236 in 2018, to 517 in 2019, indicating a large increase in the number of households that benefited from the efforts. A relative risk reduction of 0.66 (95% [CI] 0.53, 0.76) in the number of fall calls and 0.63 (95% [CI] 0.46, 0.75) in the number of fall-related calls resulting in transports to the hospital were observed. **Conclusions:** Community-FIT may offer a powerful mechanism for community paramedics to reduce fall-related 9-1-1 calls and transports to hospitals that can be implemented in emergency medical agencies across the country. **Key words:** community paramedicine; older adult falls; fall prevention; injury prevention

PREHOSPITAL EMERGENCY CARE 2021;00:000–000

INTRODUCTION

Falls can be catastrophic (1, 2) and costly (3, 4), especially for older adults and medically vulnerable individuals desiring to age at home (5). In recent years emergency medical service (EMS) calls for falls or mobility assists that do not require further medical care (deemed "lift assists") have increased significantly and are associated with revenue loss and the diversion of resources from higher acuity EMS events (6–8). Emerging evidence suggests that lift assists specifically may signal medical decline resulting in future falls and EMS calls (9). Leveraging fall-related EMS calls to activate and implement fall prevention interventions creates opportunity to avert medical transport and prevent future falls (10, 11).

Community paramedicine (CP) is an emerging model that redirects EMS resources toward injury prevention and health promotion (12–15) and offers a potential opportunity to support fall prevention efforts. The CP model has been used to support preventive health interventions and mitigate health system gaps for other chronic conditions and health outcomes (14, 16). However, implementation of these preventive health interventions often necessitate specific training and operational considerations for the CP model. Evidence and procedural protocols to implement fall prevention within CP practices are limited, and as a result, implementation and outcomes are subject to great variation. Without adequate training and support, the potential of CP fall prevention may never be reached.

Clinical pathways (i.e., structured plans/protocols for care) can support systematized integration of evidence-based strategies and minimize variation in care processes (17, 18). Clinical pathway implementation and refinement can be supported through the creation of a learning health system infrastructure. Learning health systems use scientific evidence, informatics, and patient-clinician partnerships to support continuous and rapid improvements in the effectiveness and efficiency of care (19). Development and implementation of a clinical pathway and learning health system infrastructure offer an opportunity to systematically test, evaluate, and improve quality and outcomes for CP engagement in fall prevention efforts. This report describes the evolution and outcomes for a community-level fall prevention quality improvement initiative focused on implementing a clinical pathway and learning health system through a partnership between an academic medical center and an EMS agency's CP program.

METHODS

Initiative

The initiative entailed development of a fall prevention delivery system comprised of a clinical pathway and learning health system that the team called Community-centered Fall Intervention Team (Community-FIT). Community-FIT was designed as a systems-level intervention that was refined through a series of iterative interventions. The working hypothesis was that by systematically facilitating fall prevention directly in the homes of vulnerable individuals, implementation of Community-FIT would result in sustained decreases in incidence of falls requiring EMS involvement and the proportion of EMS fall-related calls resulting in transport to a hospital in the target community. The quality improvement goal set was to reduce the number of fall-related 9-1-1 calls and fall-related transports per month by at least 20% by the end of 2019. The authors report no relevant financial or non-financial competing interests.

Setting

The target community was a Midwestern residential, suburban city in the United States covering nearly 10 square miles with approximately 35,000 residents. The community was serviced by a fire-based EMS agency with two stations staffed by 50–53 dual-role firefighter/paramedics. Approximately 17% of the community was age 65 or older. In this community, the local nursing homes and assisted living residences were typically serviced by a private, contracted EMS company. The data and interventions presented here represent data for individuals who were not living in nursing or assisted living facilities.

Study Design

The study design was a quality improvement initiative applying the Model for Improvement (20, 21) and an implementation science framework (Exploration, Preparation, Implementation, and Sustainment framework; EPIS) (22, 23) with retrospective interrupted time-series analysis comparing community-level outcomes data for a baseline period to a post-implementation period. The quality improvement components of this report were structured using the Revised Standards for Quality Improvement Reporting Excellence guidelines (24, 25). The times-series analysis was approved by the Ohio State University's Institutional Review Board

as a retrospective review of de-identified, aggregated 9-1-1 call records.

The design and evaluation of Community-FIT was guided by the EPIS framework (22, 23). EPIS is comprised of four phases and prompts consideration of organizational key factors related to inner and outer contexts, different elements that may bridge these factors, and the nature of interventions being implemented. The Exploration Phase represented a 12-month period of data that served as the baseline status/comparator for the initiative and entailed the period when there was no active CP team for the community. The Preparation Phase represented the planning period for Community-FIT when the CP team was active but not focused directly on systematic fall prevention. The Implementation Phase entailed Community-FIT testing and refinement carried out using Plan-Do-Study-Act cycles aligning with The Model for Improvement (20, 21) and could be viewed as a "wash-in" period. The Sustainment Phase represented the phase where Community-FIT was fully developed and being implemented consistently. The planned comparison of the pre-post initiative results was the 12-month Exploration Phase data (September 2016–August 2017) to the 12-month Sustainment Phase data (September 2018–August 2019). Table 1 provides an overview of key activities and learnings for the project by phase.

Data Collection and Use

Approaches to gather information, plan, and refine Community-FIT included: 1) point-of-care process observations (i.e., "Gemba Walks"), 2) focus groups evaluating perceptions of CP engagement in fall prevention, 3) literature reviews on community paramedicine, fall prevention, and implementation science, 4) audit and feedback on the initial CP fall prevention efforts, and 5) consultation and brainstorming with participants in a learning collaborative (i.e., Community-FIT Collaborative). The academic partners and CP team met 1–2 times monthly throughout the Preparation, Implementation, and Sustainment Phases. The notes and reflections from these meetings incorporated consideration and discussions related to the EPIS domains and served as the formative evaluation for Community-FIT. Data for the time series analysis were extracted by the agency, with the analysis led by the academic partners.

Community-FIT Outcome Measures and Analyses

Primary outcome measures were relative risk reduction of the number of EMS lift assists, fall calls, and the number and proportion of fall-related transports to the hospital. "Fall-related" calls were a composite measure of the sum of lift assists (no injury suspected but resident needed assistance to return to a position of mobility) and fall calls (potential injurious event) in a given month. The intention behind this composite measure was to capture all fall-related transports, regardless of if the call was considered a lift assist that was transported due to a concern for frailty or a fall call resulting in transport for injury or concern for frailty. Secondary measures included population-adjusted comparisons of the number of lift assists, fall calls, and fall-related transports per month by phase. Interrupted time series analyses were used to compare the baseline phase (Exploration phase) averages to the final phase (Sustainment Phase).

SPSS Statistics for Windows, Version 27 (IBM Corp., Armonk, N.Y., USA) was used for the quantitative analyses. For analysis of the primary and secondary outcome measures, we combined the Preparation and Implementation Phase into a single category to represent a "wash-in" period. The Exploration Phase, Preparation/Implementation Phase, and Sustainment Phase each represented a set of 12 months of matched data (September–August of the given year). Descriptive statistics and relative risk reduction estimates were used to compare the phases. Formative evaluation used the combined input from the CP team and academic partners with specific consideration of the organizational factors included in the EPIS framework.

Results

Between September 2016 and August 2019, the EMS team responded to 10,215 emergency calls; 892 (8.73%) were fall-related. The CP team completed 25 (all new) visits in 2017, 236 (42 new, 194 follow-ups) visits in 2018 and 517 visits (109 new, 398 follow-ups) in 2019. A direct comparison of the Exploration Phase and Sustainment Phase percentage of fall-related calls to total EMS calls demonstrated a decrease from 10.8% to 8.5%, despite a slight increase in the estimated population being serviced by the EMS agency.

Specific demographics for the CP services for 2017 and 2018 were unclear due to limited structured record-keeping, which became an optimization goal and part of the learning health system infrastructure implemented in 2019.Beneficiaries of the CP program in 2019 were on average 77 years old (SD = 16.09 years; range 6–100 years) with 58.5% females. Average visit duration for a community paramedic visit during 2019 was 1 hour, 30 minutes (SD =

TABLE 1. Key activities and learnings by phase

Phase	Initiative Status	Key Phase Activities	Key Learnings
Exploration (September 2016–August 2017)	-No active CP team, but city leaders and EMS Division expressed interest and began to invest resources toward building one.	-The EMS Division began consulting with other active CP programs across the United States to plan for the development and pilot testing of a CP program for their community.	-Backing from city leaders and the EMS Division leadership helped provide critical cultural and financial support to provide resources establish a plan for development of a CP program.
	-Data extractions from 911 call system were made available for baseline analysis of primary outcome measures.	-Two firefighter/paramedics on staff attended a formal workshop on CP where they learned new skills for engaging with vulnerable community members and how to connect them to local resources. Skill training included: assessing mental health, assessing social determinants of health, motivational interviewing, cultural sensitivity, strategies to support care coordination (e.g., collaborating with primary care providers and other specialists), and strategies to provide client-centered support for bridging healthcare system gaps.	- Both firefighter/paramedics selected to help develop the community paramedic program were natural leaders with a passion for EMS and willing to learn new skills. One was experienced in mental health management. The other was experienced in data management and building data reports from the 911 call system. Their skillsets, interests, and personalities complemented each other well, which helped them plan and execute the initiation of the community paramedic program for the community.
	-Baseline data led to recognition that fall-related calls (fall calls + lift assists) made up ~10% of total call volume.		
Preparation (September 2017–May 2018)	-The CP team became active and engaged in general health promotion and injury prevention activities.	-The CP program began operating for a 24-hour period every third day with two team members. Primary CP program activities included: CPR training, car seat checks, home checks and care coordination assist for frequent EMS utilizers and connect vulnerable citizens to social service resources.	-Chart audits for EMS visit data suggested a subset of fall-related calls frequently came from a subgroup of individuals with a range of health conditions. Many of these individuals were older and/or had significant physical or cognitive impairments.
	-Fall prevention activities during this phase were unstructured with limited integration of evidence-based assessments and interventions.	-The EMS-Academic partnership was initiated to help conduct literature searches and develop a plan to systematically address the high incidence of falls and lift assists.	-The procedures for community paramedic visits in general were still actively evolving and often varied greatly from visit to visit.
		-The CP team and academic partners began to regularly engage with other groups working on fall prevention through establishment of Community-FIT Collaborative.†	-Fall prevention was a new activity for which the CP team had not received official training for assessment or interventions.
			-Multiple record-keeping systems that did not interact with one another and managed by different stakeholders made it difficult to systematically identify

(*Continued*)

Table 1. (*Continued*).

Phase	Initiative Status	Key Phase Activities	Key Learnings
			high-risk community members. Additionally, it was difficult to aggregate information across the data systems to actively monitor falls and health status of any one individual or the community as a whole.
Implementation (June 2018 –September 2018)	-The CP team began to work with academic partners to develop and refine Community-FIT (a clinical pathway combined with a LHS to systematically identify, provide interventions, and monitor individuals at high-risk for falls).	-The CP team and academic partners engaged in Plan-Do-Study-Act cycles for the clinical pathway to support integration of evidence and improvement of fall prevention processes.	-With some slight modifications, evidence-based algorithms and protocols for fall prevention screens and interventions were useful to help develop the Community-FIT clinical pathway for fall prevention.
		-The CP team and academic partners engaged in Plan-Do-Study-Act cycles for the LHS to support consistent collection and use of data at the individual resident and community levels.	-Referrals from the 911 scene remained inconsistent, with the CP team mostly learning of potential beneficiaries through word-of-mouth and checking recent 911 call records. There was a recognized need to create a process for CP referral directly from a 911 call event.
		-Additional members of the EMS agency were trained to be able to provide support to the CP staff as needed and to help install grab bars in homes when time and resources allowed.	-Early on, records for the CP visits were completed on paper forms. Data was often inconsistently collected and difficult to aggregate for analyzing and reporting. By the end of this phase, the data collection forms and processes became digitized and hard-coded into a database allowing for improved analysis and reports. However, use of the data to directly improve operational processes and monitor patient health status exacerbations in real-time remained limited.
		- As the length of the evaluations increased, assessments were split into screens and comprehensive fall risk assessments. -As the volume of residents being treated by the CP team grew, there was a need to create a prioritization system to guide planning for follow-ups. An acuity scoring system was added to the clinical pathway and LHS to address this need (see Figure 1).	

(*Continued*)

TABLE 1. (*Continued*).

Phase	Initiative Status	Key Phase Activities	Key Learnings
Sustainment (September 2018–August 2019)	-The CP team was consistently implementing the Community-FIT clinical pathway.	-The creation of a process for referral to the CP team from the scene of a 911 call began at the start of this phase. The referrals did not have to be specific to falls, just a flag that the patient was generally frail or vulnerable and could potentially benefit from follow-up screens and potentially interventions.	-The process for referral to the CP program from the 911 scene created a rapid increase in the number of new evaluations. The increased referrals made it difficult to keep up with follow-up visits to monitor and provide additional interventions.
	-In February 2019, there was also consistent use of the LHS for systematically identifying patients and monitoring their progress for process/quality improvement purposes remained limited.	-The CP team added an additional half-day of service time every third day and a full-time coordinator to assist with scheduling and care coordination. Two additional fully-trained community paramedics were added to the team to cover the additional hours.	-In May 2019, the LHS enabled the CP team to account for a large increase in fall-related calls from a select few of the patients already being managed by the CP team. By increasing the staffing and hours for the CP program to help manage the higher volume of referrals, the system level reduction in the fall-related calls resumed.
		-The CP team began sharing data with city and EMS agency leaders to help procure ongoing funding for the program and a "Pay-It-Forward" campaign was started to help continue to provide resources.	

CP = community paramedicine; EMS = emergency medical services; LHS = learning health system; Community-FIT Collaborative† = a formal learning collaborative open to individuals from a variety of disciplines and organizations interested in working together and learning from each other to radically reduce the burden of falls in their communities. Meetings typically occur quarterly and entail semi-structured discussions and presentations about local resources, programs, and approaches for fall prevention.

37 minutes; range 33 minutes–3.5 hours) for intake/evaluation and 35 minutes (SD = 23 minutes; range 5 minutes–2.5 hours) for follow-up. Throughout the Sustainment Phases, the CP team provided fall screens during all initial visits and implemented further fall evaluation and prevention strategies based on evidence-based assessments and individual patient needs.

Clinical Pathway Results

The Plan-Do-Study-Act cycles resulted in a clinical pathway (Figure 1) that the CP team could consistently implement and embed as part of their operational processes. All activities in the clinical pathway were carried out by the CP team members during their service hours. As denoted in the figure, the CP home visit pathway could be initiated by a 9-1-1 visit that identified a person as a potential candidate for a home visit, by self-referral through a phone call, or by referral by a physician or other community member. Once a referral was initiated, a member of the CP team would contact the person to describe the CP program services, determine the community member's interest, and schedule a home visit if desired. Of the patients identified for a CP referral, approximately 10% per year declined services. No information is available on the outcomes for these individuals. Through iterative Plan-Do-Study-Act cycles, the initial visit eventually evolved from a fully comprehensive fall risk evaluation for every patient to one that became one that focused on high-level screens, information gathering, and building rapport rather than a comprehensive fall risk evaluation. A follow-up visit was then scheduled for individuals who were considered particularly vulnerable for falls based on the screen. This change created a more efficient and effective triaging of the fall prevention activities toward residents that were most vulnerable and interested in the fall prevention strategies the CP team could offer.

The clinical pathway supported consistent implementation of components of the Stopping Elderly Accidents, Deaths & Injuries (STEADI) Tool Kit

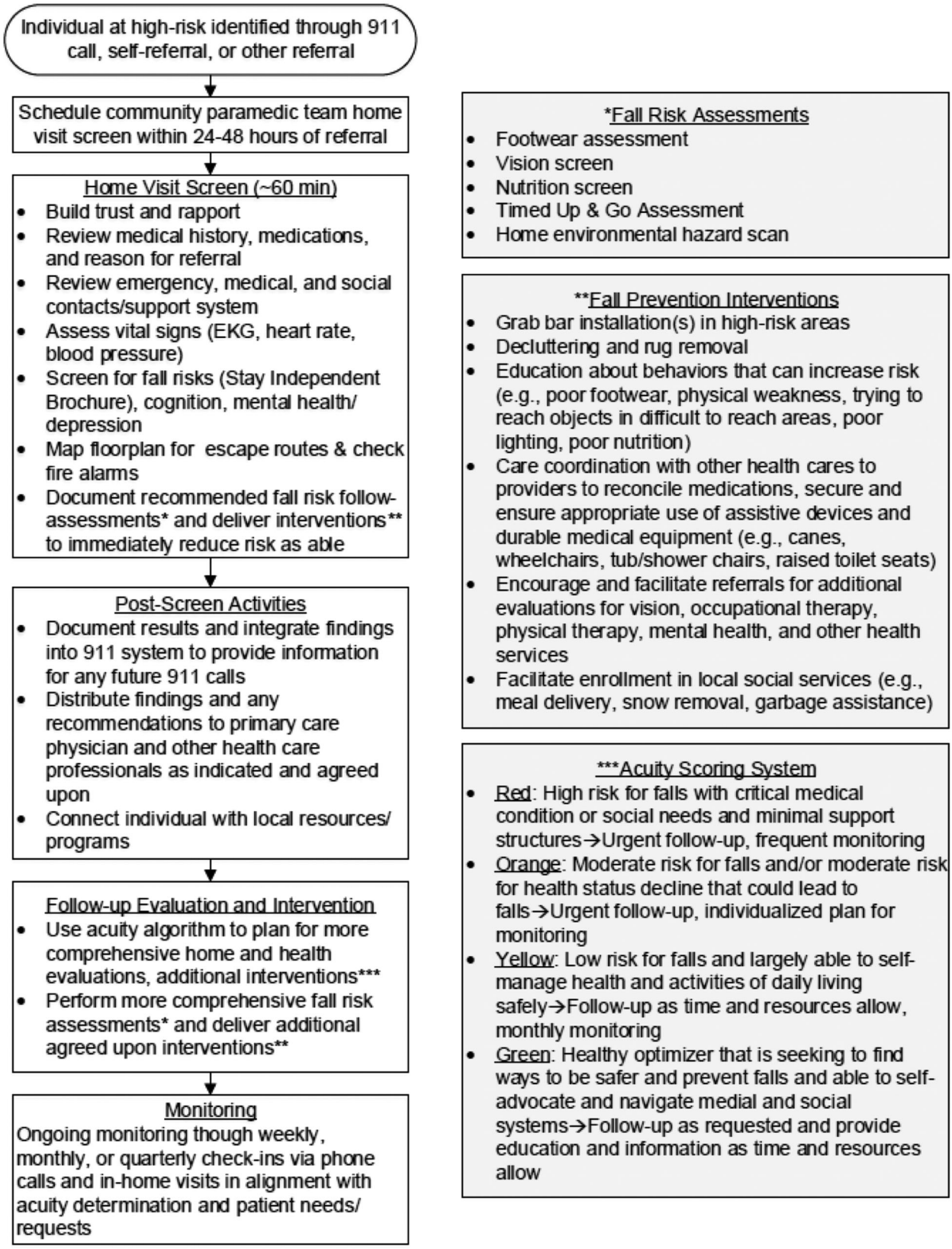

Figure 1. Clinical pathway for community-FIT.

TABLE 2. Descriptive statistics and impact by metric and phase

Measure	Exploration	Preparation + Implementation	Sustainment	RRR (95% CI)
Lift assists/month				
Mean (SD)	17.75 (3.54)	18.33 (5.37)	17.33 (5.48)	
Median	17	19	16	0.04 (-0.17 to 0.2)
Minimum	12	10	10	
Maximum	26	29	31	
Fall calls/month				
Mean (SD)	11.25 (3.05)	5.83 (3.5)	3.83 (2.3)	
Median	11.5	5	3.5	0.66 (0.53 to 0.76)*
Minimum	7	1	0	
Maximum	16	12	9	
Fall-related ~ transports/month				
Mean (SD)	8 (2.34)	5.17 (2.76)	3 (2.63)	
Median	7.5	4	2.5	0.63 (0.46 to 0.75)*
Minimum	5	3	1	
Maximum	13	10	10	
% Fall-related ~ transports/month				
Mean (SD)	27.76 (7.67)	20.89 (8.28)	14.10 (10.43)	
Median	25.9	17.52	8.41	0.49 (0.27 to 0.64)*
Minimum	15.15	9.38	4	
Maximum	41.93	40	34.48	

Fall-related~ = (lift assists + fall calls); RRR = Relative risk reduction; CI = confidence interval.
* = statistically significant per 95% confidence interval interpretation for relative risk calculation.

(26–28) and the Home Safety Self-Assessment Tool (HSSAT) (29, 30). During the Sustainment Phase, the CP team's operational processes for evaluation, documentation, and follow-up consistently aligned with the processes and flow presented in Figure 1, thereby reducing unnecessary variations in service delivery and documentation of patient information and processes. Enhanced evaluation and documentation strategies specifically included more details regarding the general patient's personal and medical history, results of evidence-based fall risk assessments, identification of home environment hazards, recommended fall prevention interventions, and patient/family values and preferences.

Learning Health System Results

The learning health system infrastructure entailed the development of a hard-coded electronic health record database using a customized community paramedicine set-up in the Healthcall platform (HealthCall, LLC). The customized system included features to ensure consistent documentation of information that could be extracted for learning purposes and mechanisms to facilitate communication between the 9-1-1 scene, the CP team, and CP team evaluations. One component of the LHS entailed a short set of questions paramedics at a 9-1-1 scene were required to answer regarding the patient's vulnerability and potential to benefit from a CP team follow-up. This created a push system to activate a CP team home evaluation and implementation of the Community-FIT clinical pathway. The CP team used the hard-coded database to ensure an enhanced documentation system that could provide key summaries of patient data to be accessible to the 9-1-1 call scene electronic health system and provide critical insight into the patient's medical and social history for future 9-1-1 calls. During the Implementation and Sustainment Phases, the learning health infrastructure helped provide key reports that could be used to monitor individual patient and system-level outcomes to continuously improve operations and services.

Lift Assists

The change in lift assist calls was minimal with a relative risk reduction estimate of 0.04 (95% CI 0.17 to 0.2; Table 2). The total number of lift assist calls in the Exploration Phase was 213 compared to 208 in the Sustainment Phase. Figure 2 shows little to no change in lift assists over the study period.

Fall Calls

A significant reduction in fall calls was observed with a relative risk reduction of 0.66 (95% CI, 0.53 to 0.76) comparing the Exploration Phase to the Sustainment Phase. The population-adjusted rates were similar, demonstrating a percent change of 66.35% from baseline (Figure 2). The absolute total number of fall calls in the Exploration Phase was 135 compared to a total of 46 in the Sustainment Phase.

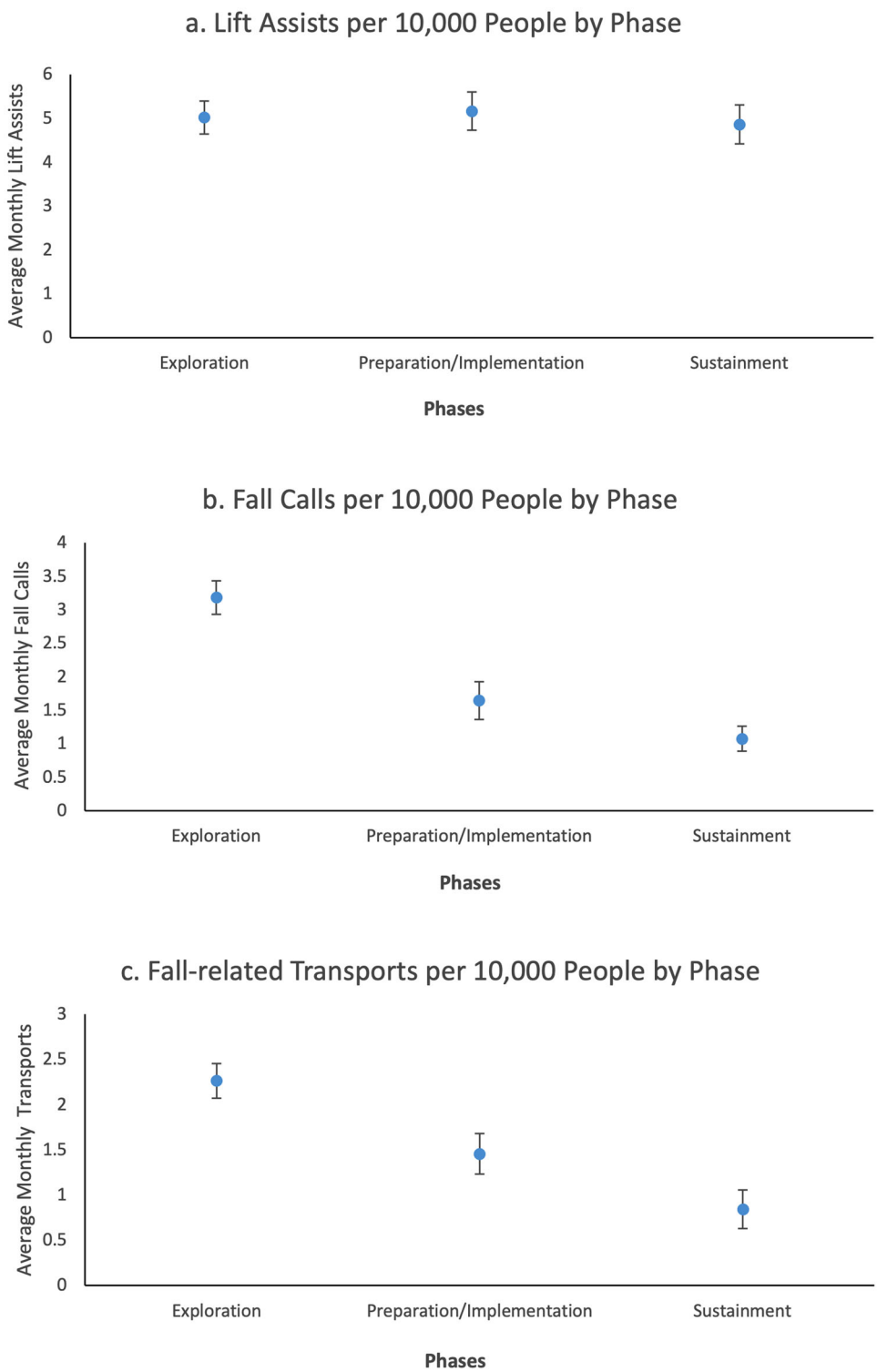

Figure 2. Population-adjusted outcomes by phase.

Fall-Related Calls Resulting in Transport

The total number of fall-related calls resulting in transport decreased from 96 during the Exploration Phase to 36 in the Sustainment Phase. Compared to baseline values, the relative risk reduction for the total number of falls was 0.63 (95% CI, 0.46 to 0.75) and the proportion of fall-related calls resulting in transport was 0.49 (95% CI, 0.27 to 0.64). The population-adjusted number of transports demonstrated

a similar pattern, with a percent change of 62.83% from baseline.

Formative Evaluation

Key formative evaluation results are provided in the Key Learnings column in Table 1. Several key learnings included:

- The CP model offers fall prevention solutions for individuals who are particularly vulnerable and may not have access to or be able to get the care they need other than through transport to hospitals after a fall.
- After being educated about Community-FIT, paramedics at 9-1-1 scenes reported they felt they now had another option besides a transport to the hospital when a person was considered frail and vulnerable to another fall but not in need of urgent medical attention.
- The learning health system infrastructure helped close key information gaps between the 9-1-1 scene and the CP team visits. This further enhanced care at the 9-1-1 scene for future calls by providing a depth of insight and information that the emergency paramedics would not have otherwise had available.
- The city's and EMS agency's ongoing support fueled the program's inception and piloting of a clinical pathway and LHS infrastructure.
- The academic partnership provided the CP team with additional stakeholder perspectives and key skill-training, especially in the realms of data management and quality improvement.

DISCUSSION

The high incidence of falls, soaring medical costs, and potential for death or life-altering injury emphasize a paramount need for the healthcare system to implement effective fall prevention strategies that reduce the burden of falls at the population health level. The results of this project indicate a fire-based EMS agency with a CP program may be leveraged to reduce fall-related calls and related transports through the embedding of a model like Community-FIT that incorporates both a clinical pathway and learning health infrastructure for fall prevention. The immense growth in the number of CP visits that included systematic fall prevention evaluation and interventions with implementation of Community-FIT provides further evidence that individuals vulnerable to falls may benefit from a community-based fall prevention effort administered through a CP model.

By offering in-home evaluations that can be timed in non-emergency visits and a nexus for care coordination support, CP has the potential to address current key system gaps in fall prevention implementation. However, fall prevention entails an expansion of paramedic skills and operations. Community-FIT offers CP teams a template that can be used to help systematically identify and provide personalized fall prevention interventions directly in the homes of people who greatly need them.

Findings from this project highlighted that among individuals at high risk is a subset who are generally at a higher risk for falling more frequently and sustaining more serious fall-related injuries (e.g., individuals with cognitive impairments and/or physical limitations). Current health system and community-based fall prevention efforts can help improve individual-level outcomes, but may be implemented in ways that may "miss" highly vulnerable individuals in a community. Community-FIT offers a way to systematically identify high-risk individuals and consistently provide personalized fall prevention interventions.

In contrast to other types of fall prevention intervention studies and programs, Community-FIT is not characterized by rigid inclusion and exclusion criteria as part of intervention delivery processes. This allows for a flexible net to catch vulnerable individuals, regardless of age. Community-FIT also operates as a community/system-level intervention, which may yield population health results that exceed what might be expected by interventions that generally target less frail individuals at an individual level. The flexible inclusion criteria combined with clinical pathway and learning health system components of Community-FIT help to ensure high-risk individuals get comprehensive fall risk evaluations, implement fall prevention strategies, and monitor for further decline/risks. Collectively, this helps provide a novel way to systematically identify and provide fall prevention treatment for high-risk individuals.

One unique strength of this initiative was the combination of an implementation science framework with the adaptable implementation/quality improvement design offered by the Model for Improvement. The EPIS framework provided a systematic way to consider implementation barriers and facilitators, while the Plan-Do-Study-Act-Cycles supported systematic testing and adaptation of intervention strategies. As a result, the Community-FIT system likely evolved in a way that was sustainable for the CP team and resulted in direct improvements in desired outcome measures.

Community-FIT appears to have had a limited effect on lift assists. Further review of the data found lift assists largely represent first-time callers

who had not yet benefited from CP program efforts and, in agreement with other studies, may be an early indicator of decline (8, 9). There were also lift assist calls from residents who had previously received CP interventions that may actually have helped offset what could have ended up as an injurious fall call without the CP interventions (e.g., grab bar helped prevent injury fall but the individual still needed assist to get up). Additionally, given the general anticipation of an upward trend in lift assists nationwide, the lack of a clear upward trend in lift assist calls with Community FIT implementation could potentially be viewed as a positive effect. As it stands, the Community-FIT clinical pathway emphasized home modifications and care coordination, which may have helped limit injurious falls but not be fully addressing interventions to address unsteadiness in balance to the fullest extent. (e.g., direct interventions for strength and mobility impairments). Future work could involve optimizing the clinical pathway to integrate additional strategies to more directly facilitate enrollment in local balance/fall prevention programs and services that focus on physical/physiological risk factors for falls (e.g., wellness and fitness programming, fall prevention programming at the senior center, physical therapy and occupational therapy interventions for improving strength, motor control, and overall safety with activities of daily living).

Study Limitations

The data presented here represents a single, relatively small community using a pre-post comparative design supported through grant mechanisms. The CP program was already active and established when Community-FIT was implemented, and the community had a history of providing connection to social services. The city and fire-based EMS agency leadership were very supportive financially and operationally for sustaining the CP program, which may not be the case in other communities. Evaluating the economic implications of this model including the potential costs associated with implementing CP fall prevention and stakeholder evaluations of the potential risk and reward of budgeting and implementing the CP fall prevention are critical future research directions. It is also important to acknowledge that the outcome measures did not account for potential falls and transports that occurred within the community for which the EMS system was not called. Additional studies are needed to evaluate the efficacy of Community-FIT that include communities with emerging CP programs, different types of community settings, and variable access to resources and leadership support for the CP program.

Conclusions

CP is a growing model of care globally that redirects emergency response service resources toward preventive care for vulnerable individuals provided in non-emergency contexts. CP engagement in fall prevention activities offers a promising new delivery system to support a community-level approach to get effective fall prevention solutions into the homes of the people who need it most. However, there is currently limited infrastructure and guidance to support community paramedic programs in providing high-quality, evidence-based fall prevention care. Using implementation and improvement science theories and frameworks in combination with multi-stakeholder feedback, Community-FIT offers a mechanism to address this gap. The results of this study demonstrate that CP implementation of Community-FIT offers a potentially powerful and innovative system to address in-home falls among vulnerable individuals. Additional studies are needed to confirm the utility and effectiveness of CP fall prevention and Community-FIT as a facilitation mechanism.

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