

# UCSF

## UC San Francisco Previously Published Works

### Title

Effect of a Mobile Integrated Hospice Healthcare Program on Emergency Medical Services Transport to the Emergency Department

### Permalink

<https://escholarship.org/uc/item/6nq2415v>

### Journal

Prehospital Emergency Care, 26(3)

### ISSN

1090-3127

### Authors

Breyre, Amelia  
Taigman, Michael  
Salvucci, Angelo  
[et al.](#)

### Publication Date

2022-05-04

### DOI

10.1080/10903127.2021.1900474

### Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed



## Effect of a Mobile Integrated Hospice Healthcare Program on Emergency Medical Services Transport to the Emergency Department

Amelia Breyre, Michael Taigman, Angelo Salvucci & Karl Sporer

To cite this article: Amelia Breyre, Michael Taigman, Angelo Salvucci & Karl Sporer (2021): Effect of a Mobile Integrated Hospice Healthcare Program on Emergency Medical Services Transport to the Emergency Department, Prehospital Emergency Care, DOI: [10.1080/10903127.2021.1900474](https://doi.org/10.1080/10903127.2021.1900474)

To link to this article: <https://doi.org/10.1080/10903127.2021.1900474>



Published online: 30 Mar 2021.



Submit your article to this journal [↗](#)



Article views: 26



View related articles [↗](#)



View Crossmark data [↗](#)

# EFFECT OF A MOBILE INTEGRATED HOSPICE HEALTHCARE PROGRAM ON EMERGENCY MEDICAL SERVICES TRANSPORT TO THE EMERGENCY DEPARTMENT

Amelia Breyre, MD , Michael Taigman, EMT-P, MA, MS, Angelo Salvucci, MD, Karl Sporer, MD

## ABSTRACT

**Objective:** To evaluate the effect of a Mobile Integrated Hospice Healthcare (MIHH) program including hospice education and expansion of paramedic scope of practice to use hospice medication kits. Primary outcome was the effect on hospice patient transport to the Emergency Department. Secondary outcomes included reasons for patient transport and review of MIHH kit utilization. **Methods:** In 2015, the project was implemented in Ventura County, California in collaboration with county emergency medical services (EMS) agency, first response/transport organizations, and hospice programs. Paramedic supervisors received 30 hours of hospice training focusing on palliative care, grief and crisis counseling. When 9-1-1 was called for a patient, EMS first responders arrived on scene, determined a patient was enrolled in hospice and then contacted trained MIHH. **Results:** Six months (2/2015-7/2015) prior to project implementation the percentage of hospice patients transported to the ED averaged 80.3% (98/122). During the first (8/2015-7/2016), second (8/2016-7/2017) and third year (8/2017-7/2018) after project implementation, the percentage of hospice patients transported to the ED was 36.2% (68/188), 33.2% (63/190)

and 24.8% (36/145) respectively. A total of 523 hospice patients were cared for by MIHH during this three-year interval. Of those hospice patients transported, the most common reason for transport was fall/trauma. The MIHH hospice kit was only used once in the field. Odds ratio for hospice transportation to the ED before and after project implementation was 0.125 (95% Confidence Interval: 0.077 to 0.201;  $p < 0.0001$ ). This represents an absolute reduction risk of 46.6% (95% Confidence Interval: 38.53% to 54.72%). **Conclusion:** MIHH decreased the transportation of hospice patients to the ED. MIHH provided hospice education, provided family grief support and developed treatment plans with hospice nurses. An expanded scope of practice, including a paramedic hospice kit, was not contributory to this decrease. **Key words:** hospice; palliative care; community paramedicine; mobile integrated healthcare

PREHOSPITAL EMERGENCY CARE 2021;00:000–000

## INTRODUCTION

### Background

More than 1.5 million patients receive hospice services annually in the United States (1). Hospice care aims to provide comprehensive medical care and support for patients and families at the end of life (2). However, situations arise frequently in which emergency medical services (EMS) providers are called to care for hospice patients (3–5). In contrast to the objectives of hospice, the EMS system was designed to reduce death and disability and EMS training focuses on saving lives through resuscitation, aggressive treatment and transportation to the Emergency Department (ED) (5, 6).

In a national survey of EMS protocols from 2002, only 6% of EMS systems had a palliative care protocol (7). In a survey of EMS providers, 84.1% of whom had cared for hospice patients overwhelmingly expressed a need for more formal training (3). Paramedics felt their preparation in end-of-life skills, such as communicating death to family or friends, was significantly lower than that for clinical skills such as endotracheal intubation or defibrillation (8).

Mobile Integrated Healthcare (MIH), sometimes referred to as community paramedicine is an innovative model of care that seeks to improve effectiveness and efficiency of health care delivery by using specially trained paramedics in partnership

---

Received December 8, 2020 from Department of Emergency Medicine, University of California San Francisco, San Francisco, California (AB, KS); Healthcare Administration and Interprofessional Leadership, University of California San Francisco, San Francisco, California (MT); Ventura County Emergency Medical Services Agency, Oxnard, California (AS). Revision received March 1, 2021; accepted for publication March 2, 2021.

MT and AS conceived, designed, and supervised the study, including training and data collection. KS provided advice on study design. AB drafted the manuscript, and all authors contributed substantially to its revision. MT takes responsibility for the paper as a whole.

We would like to acknowledge Teri Helton RN, Chad Panke EMT-P, Adriane Stefansen EMT-P, Lindsey Simpson PhD, EMT-P, Tracey Maybelen-Shoop, and Julie Frey EMT-P for their efforts and contributions to this project.

The authors report no conflict of interest

Meetings: American Public Health Association, 2019, San Diego, CA

Address correspondence to Amelia Breyre, MD, Department of Emergency Medicine, University of California San Francisco, San Francisco, CA, USA. E-mail: [amelia.breyre@gmail.com](mailto:amelia.breyre@gmail.com)

© 2021 National Association of EMS Physicians

doi:10.1080/10903127.2021.1900474

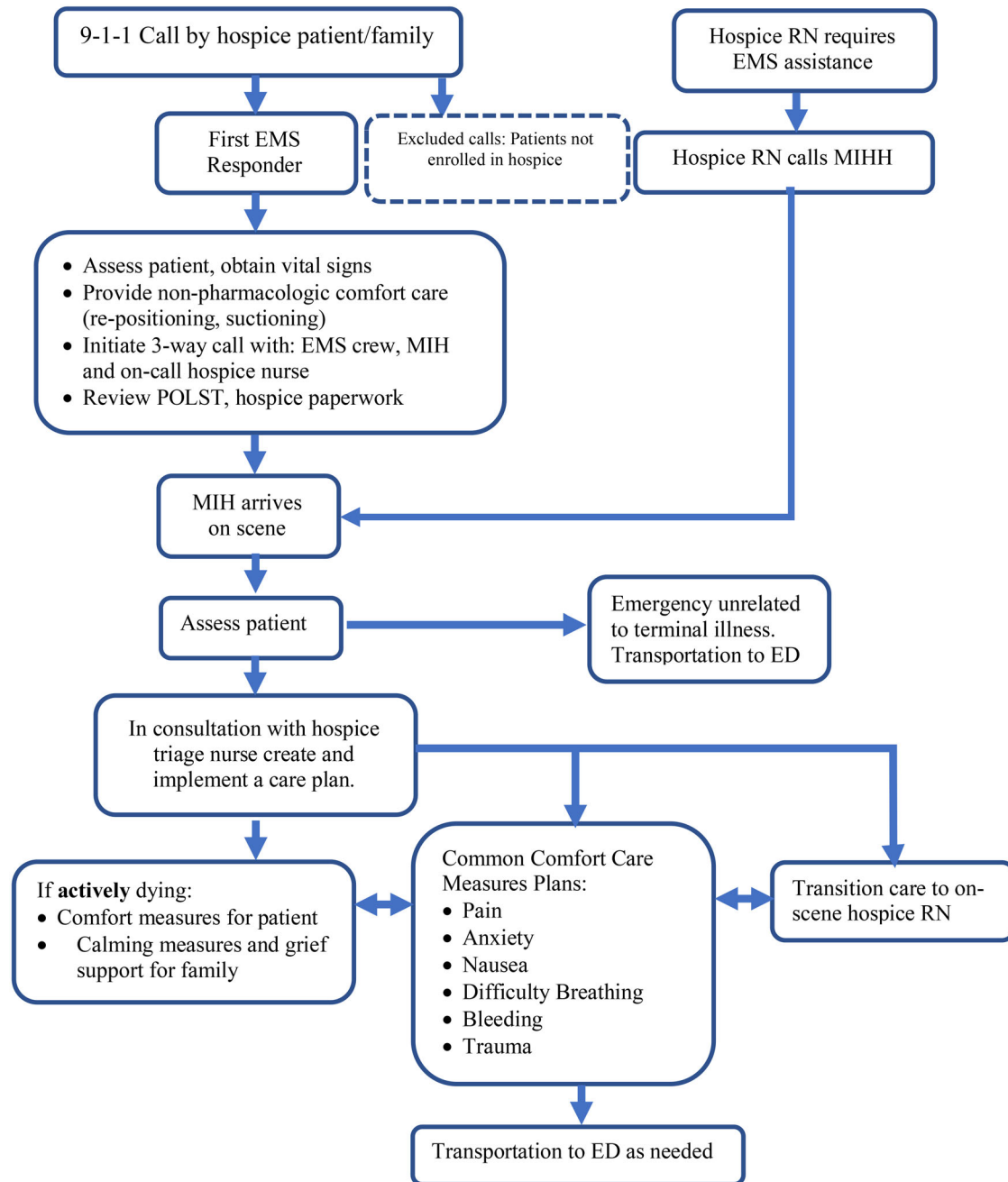


FIGURE 1. 9-1-1 mobile integrated hospice healthcare work flow.

with other health care providers to address the needs of local health care systems (9). MIH represents a unique opportunity to integrate hospice care with EMS and improve the health care systems ability to care for end-of-life patients (5, 10, 11).

**Objective:** To evaluate the effect of a mobile integrated hospice healthcare (MIHH) program including hospice education and expansion of paramedic scope of practice to use hospice medication kits. Primary outcome was the effect on hospice patient transport to the ED. Secondary outcomes included reasons for patient transport and review of MIHH kit utilization.

## METHODS

### Study Design & Setting

This retrospective observational study evaluated the effect of an MIHH program in Ventura County. Ventura County is a 2,208 square mile county with a population of 823,318, spanning both urban and rural communities and an average annual volume of 70,000 EMS calls (12). This project was a collaboration between the Ventura County EMS agency, local transporting agencies (American Medical Response (AMR)

Ventura, Gold Coast Ambulance, Lifeline Medical Transportation) and local hospice providers (Assisted Hospice Care of Ventura and Thousand Oaks, Livingston Memorial, Roze Room Hospice, TLC Hospice). Medical oversight of the project was provided by a committee of stakeholders including hospice medical directors, the County EMS medical director and members of the County Department of Public Health. The Ventura County Medical Center Institutional Review Board, a Division of the Ventura County Health Care Agency associated with the UCLA School of Medicine, granted institutional review board approval. This project adhered to the strengthening and reporting of observational studies in epidemiology (STROBE) checklist as applicable.

**Training:** Fourteen community medicine paramedics from local transporting agencies trained for this hospice program. Each community paramedic had a minimum of 200 hours of training, four years of 9-1-1 experience and were currently working as field supervisors. AMR and local hospice agencies developed and implemented EMS focused hospice training. Training included palliative care, grief counseling and crisis counseling. The training included 16-hours of classroom training and 14-hours of clinical experience including accompanying hospice nurses for home visits and hospice team case review.

**Hospice Kit/Scope of Practice change:** California's Office of Statewide Health, Planning and Development granted an expansion in paramedic scope of practice for this project in order to permit the administration of medications from a hospice kit as directed by a hospice nurse. Medication in these kits included haloperidol, lorazepam, morphine, ondansetron, acetaminophen, atropine drops, prochlorperazine, promethazine, bisacodyl, senna and enemas. Lorazepam, morphine and ondansetron are part of the standard paramedic scope of practice; the others were added as part of this pilot study.

## Participants

Study participants were identified by initial paramedics on scene who asked eligibility screening questions. Inclusion criteria included current enrollment in a hospice program as confirmed by patient or family. Patients enrolled in hospice were included regardless of age, reason for calling 9-1-1, location or vital signs. Patients that were not currently enrolled in hospice, such as those recently discharged or disenrolled, were excluded from the study.

## Implementation & Dispatch

Six months (1/2015-6/2015) prior to project implementation baseline transport of hospice patients were reviewed. MIHH training occurred 7/2015 and the project implemented 8/2015. This study reviews prospective data from 8/2015-7/2018 from the pre-hospital electronic Patient Care Records. Data was reviewed analyzed after project implementation (8/2015-7/2017) using Excel and QI Macro.

When a 9-1-1 call is placed, dispatched EMS responders, arrive on scene and determine if patient is enrolled in hospice. The EMS responder then attempts to initiate a three-way call between the hospice nurse and 24-hour on-call supervisor who is trained as MIHH. MIHH is also dispatched to the scene (Figure 1).

On arrival, the MIHH assumed care of the patient and management of the scene. If the 9-1-1 call was unrelated to the hospice illness, then traditional EMS protocols were continued. If the reason for the 9-1-1 call was related to their hospice enrollment, then the patient was cared for using the project's EMS hospice/palliative care protocols/work flow, see Figure 1. Patient safety was addressed with case reviews for protocol compliance and appropriateness of care. The cases were reviewed by a board consisting of three paramedics, two hospice nurses and an emergency physician.

## Outcomes Measured

Primary outcome was the proportion of hospice patients transported to the ED pre and post intervention. Secondary outcomes include reasons for patient transport and review of community paramedic hospice kit utilization. As a primarily descriptive study, statistical analysis was limited to the calculation of odds ratio and absolute risk reduction of the observed data.

## RESULTS

Six months (2/2015-7/2015) prior to project implementation, the mean average monthly transportation proportion of hospice patients that called 9-1-1 was 80.3% (98/122). A total of 523 hospice patients were seen by hospice-trained paramedics during the 36 months (8/2015-7/2018) of the project. During the first 6 months of the project (8/2015-1/2016), 33.3% (33/99) of hospice patients evaluated were transported to the ED. During the last 6-month interval of the project (2/2018-7/2018) 19.6% (10/51) were transported to the ED. When analyzed on an annual basis, during the first (8/2015-7/2016),

TABLE 1. Number and percentage of hospice patients transported to ED via EMS

Time period	# of patients calling 9-1-1	# of patients transported	% of patient transported (6 month interval)	% of patients transported (annual interval)
Jan 2015–Jun 2015*	122	98	80.3%	–
Aug 2015–Jan 2016	99	33	33.3%	36.6%
Feb 2016–Jul 2016	89	35	39.3%	
Aug 2016–Jan 2017	190	63	42.9%	33.4%
Feb 2017–Jul 2017	106	27	25.5%	
Aug 2017–Jan 2018	94	26	27.7%	24.8%
Feb 2018–Jul 2018	51	10	19.6%	
<b>Total (Aug 2015–Jul 2018)</b>	<b>543</b>	<b>167</b>	<b>34.3%</b>	<b>34.3%</b>

\*Pre MIHH implementation.

second (8/2016-7/2017) and third year (8/2017-7/2018) after project implementation, the percentage of hospice patients transported to the ED was 36.2% (68/188), 33.2% (63/190) and 24.8% (36/145) respectively.

For the project duration (8/2015-7/2018) there was an average of 14.5 hospice patient calls per month, with an overall transport proportion of 31.9% (167/543). Table 1 summarizes the EMS transport of hospice patients before and after project implementation in 6-month intervals. Figure 2 demonstrates the number of hospice patients transported by EMS to the ED monthly as well as the percentage this represents of overall patient transport for the 6-month interval. Odds ratio for hospice transportation to the ED before and after project implementation was 0.125 (95% Confidence Interval: 0.077 to 0.201;  $p < 0.0001$ ). This represents an absolute reduction risk of 46.6% (95% Confidence Interval: 38.53% to 54.72%).

Out of the 523 cases, MIHH administered medications from their hospice kit in only one instance. The remaining 522 other cases involved calming the family, coordinating logistics, advising the family to administer medications in discussion with hospice staff and emotional/grief support.

A review of the reasons for hospice patient transport to the ED (8/2015-10/2016) demonstrated that the most common reason for transport was a fall with injury (34.1%; 30/88) followed by altered level of consciousness (9.1%; 9/88) and difficulty breathing (8.0%; 7/88). Of note, two patients died while MIHH were present. Twelve patients died before MIHH arrival. These patients were therefore not transported by EMS.

## DISCUSSION

Overall the MIHH program had a dramatic effect in reducing the percent of hospice patients transported to the ED, from 80.3% in the 6 months before project implementation to the 19.6% during the last

6 months of the project (Table 1). Patients that ultimately were transported to the ED were for trauma, an acute change in patient condition that may still benefit from interventions available in the ED aligned with their overall goals of care.

Hospice medication kit use frequency was low; it was only used once out of 543 patients, because most patients did not require medications and for those that did family was able to administer. The one scenario where medication was administered using the expanded scope of practice occurred with an agitated 91-year-old on hospice for cancer who received haloperidol. The haloperidol was ordered by the patient's hospice physician and administered by the MIHH. Thus, the benefits of the MIHH program did not depend on expanding the paramedic scope of practice to include comfort kit medications. In the majority of cases, MIHH provided hospice education, grief support and/or developed a treatment plan with the hospice providers. This acquired MIHH skill set avoided transportation to the ED that may have been unnecessary or unwanted. When hospice patients are admitted for reasons unrelated to their terminal illness, they may be disenrolled from their hospice benefits. End-of-life patients in EDs and hospitals frequently have their code status reversed and may receive aggressive treatments that may not be aligned with the patients' goals of care (13, 14).

Anecdotally, the paramedics involved in the project found the experience professionally and personally rewarding. For example, MIHH was called to assist a hospice patient who fell on the way to the bathroom resulting in minimal injury. Upon MIHH investigation, the cause of his injury was that his bed was too high. Subsequently, the MIHH and ambulance crew lowered the bed to the floor so that it was safer. Three weeks later the patient died and his wife called to thank the crew for how touched the family was for their service at such a vulnerable moment.

In the months subsequent to the project the MIHH program informally transitioned and de-escalated

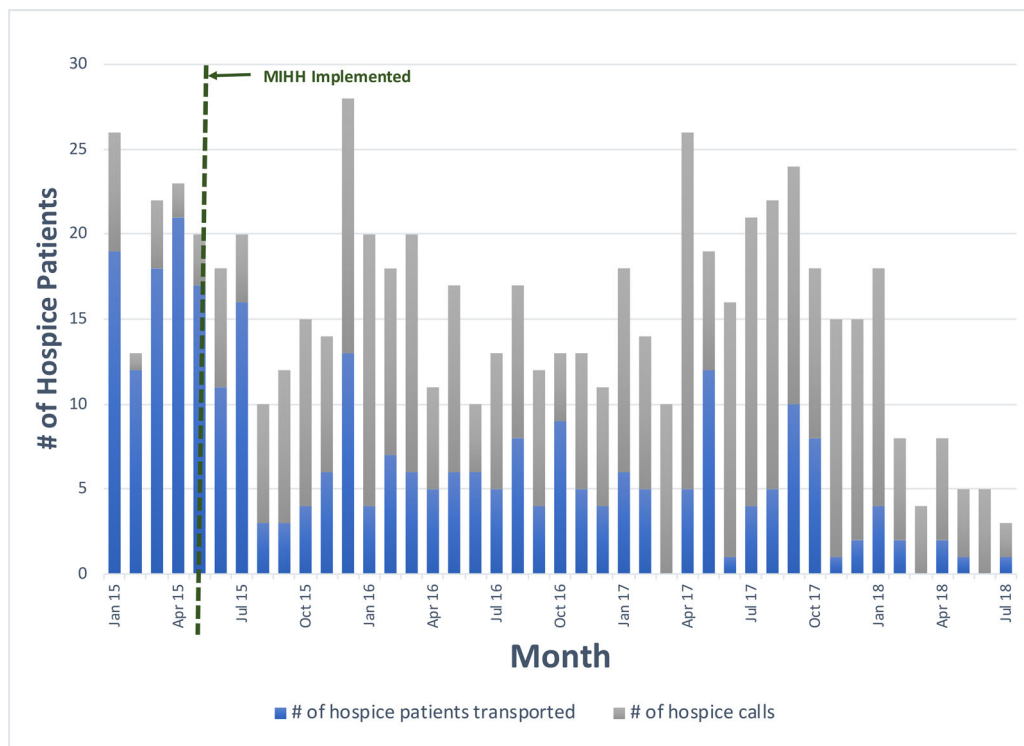


FIGURE 2. EMS transportation of hospice patients.

stakeholders agreed the goal of the program, lower percentage of hospice patients transported to the ED, was achieved. MIHH trained paramedics did not continue to formally respond to calls outlined in the protocol. The long-term sustainability of this program and hospice oriented cultural shift remains unknown.

Additional interviews of families, patients and paramedics about their qualitative experience with the MIHH program would have added an additional dimension into the impact of the project and help identify how paramedic hospice curricula can be improved. Further, do these newly acquired communication skills need to be practiced and refreshed similar to cardiac arrest resuscitation skills? The success of the MIHH program suggests that perhaps all paramedics may benefit from hospice and communication training.

An additional consideration in implementing a MIHH program is the effect such a program would have on the cost of the health care system. It is likely that such a program would save hospice agencies costs because of transportation reduction, and potentially decrease revenues for EMS systems that are reimbursed only for transported patients. Programs that reduce unnecessary transport of end-of-life hospice patients are ethically the right thing to do for the patient, and perhaps healthcare reimbursement should be modeled to reflect that.

## LIMITATIONS

There were several major limitations to this study. Firstly, the outcomes of this study were systems based and not patient-care centered. Patient/family satisfaction, frequency of hospital admissions and code status reversals would be important patient centered outcomes. Secondly, the method of patient selection, whereby paramedics screened for patients enrolled in hospice, may not have captured all eligible patients. There was an attempt to create a hospice registry that could be referenced by medical dispatch, however it proved too difficult to coordinate and maintain with all stakeholders. Thirdly, the overall transportation volume for non-hospice patients at this time was not established for comparison. It is therefore difficult to determine if the reduction in percentage of patient transportation to the ED was unique to hospice patients and the MIHH program or a more general trend in the system. Lastly, the reason for patient transportation was inconsistently documented and thus analysis is limited. For example, it is unclear if there was a seasonality to transportation rates that might coincide with flu season. The reasons for patient transportation pre and post intervention is an important aspect of understanding the specific benefits of the MIHH program, however

this data was unavailable except for the limited time period.

## CONCLUSION

Overall, this program demonstrates a successful and unique collaboration between local hospice organizations and EMS systems. This was an innovative program that demonstrated an effect on hospice patient transport to the ED. EMS providers are a crucial part of hospice patient care. Empowering EMS providers with the end-of-life education and communication skills to care for these patients reduced transportation to the ED which may lead to improved care of hospice patients and their families.

## ORCID

Amelia Breyre  <http://orcid.org/0000-0002-3255-3107>

## References

1. NHPCO. NHPCO facts and figures 2020 edition. <https://www.nhpco.org/wp-content/uploads/NHPCO-Facts-Figures-2020-edition.pdf>. Published 2020. Accessed September 30, 2020.
2. Lamba S, Mosenthal AC. Hospice and palliative medicine: a novel subspecialty of emergency medicine. *J Emerg Med*. 2012;43(5):849–53. doi:10.1016/j.jemermed.2010.04.010.
3. Barnette Donnelly C, Armstrong KA, Perkins MM, Moulia D, Quest TE, Yancey AH. Emergency medical services provider experiences of hospice care. *Prehosp Emerg Care*. 2018;22(2):237–43. doi:10.1080/10903127.2017.1358781.
4. Carron PN, Dami F, Diawara F, Hurst S, Hugli O. Palliative care and prehospital emergency medicine: analysis of a case series. *Medicine (Baltimore)*. 2014;93(25):e128. doi:10.1097/MD.000000000000128.
5. Lamba S, Schmidt TA, Chan GK, Todd KH, Grudzen CR, Weissman DE, Quest TE, IPAL-EM Board. Integrating palliative care in the out-of-hospital setting: four things to jump-start an EMS-palliative care initiative. *Prehosp Emerg Care*. 2013;17(4):511–20. doi:10.3109/10903127.2013.811566.
6. Shah MN. The formation of the emergency medical services system. *Am J Public Health*. 2006;96(3):414–23. doi:10.2105/AJPH.2004.048793.
7. Ausband SC, March JA, Brown LH. National prevalence of palliative care protocols in emergency medical services. *Prehosp Emerg Care*. 2002;6(1):36–41. doi:10.1080/10903120290938751.
8. Stone SC, Abbott J, McClung CD, Colwell CB, Eckstein M, Lowenstein SR. Paramedic knowledge, attitudes, and training in end-of-life care. *Prehosp Disaster Med*. 2009;24(6):529–34. doi:10.1017/s1049023x00007469.
9. Coffman JM, Blash L. Update of evaluation of California's community paramedicine pilot program. Healthforce Center at University of California San Francisco. [https://healthforce.ucsf.edu/sites/healthforce.ucsf.edu/files/publication-pdf/7th%20update%20to%20public%20report%20on%20CA%20%20CP%20project\\_082420.pdf](https://healthforce.ucsf.edu/sites/healthforce.ucsf.edu/files/publication-pdf/7th%20update%20to%20public%20report%20on%20CA%20%20CP%20project_082420.pdf). Published 2020. Accessed October 6, 2020.
10. Anastasio M, Bruce JD, Mezo J. Integrating home care hospice & EMS. Partnerships with MIH-CP programs can help avoid needless hospital visits. *EMS World*. 2015;44(4):28.
11. Zavadsky M, Hagen T, Hinchey P, McGinnis K, Bourn S, Myers B. 2015. Mobile Integrated Healthcare and Community Paramedicine (MIH-CP). <https://www.naemt.org/docs/default-source/community-paramedicine/naemt-mih-cp-report.pdf>. Accessed October 6, 2020.
12. US Census. US Quick Facts Ventura County, California; United States 2019. 2020. <https://www.census.gov/quickfacts/venturacountycalifornia>. Accessed October 6, 2020.
13. Cruz-Carreras MT, Chaftari P, Viets-Upchurch J. Advance care planning: challenges at the emergency department of a cancer care center. *Support Care Cancer*. 2018;26(2):585–8. doi:10.1007/s00520-017-3870-x.
14. Kaldjian LC, Erekson ZD, Haberle TH, Curtis AE, Shinkunas LA, Cannon KT, Forman-Hoffman VL. Code status discussions and goals of care among hospitalised adults. *J Med Ethics*. 2009;35(6):338–42. doi:10.1136/jme.2008.027854.