5 KEY MONEY LESSONS
for doctors to get what you want
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100% GROUPS
PRESIDENT’S MESSAGE |

Emergency Medicine Provides Value

By Larry Stock, MD, FACEP

Dear Colleagues,

As the 45th Chapter President of California ACEP, I wanted to begin to tackle the issue of building internal consensus around fundamental issues regarding emergency medicine and our patients.

In May I began writing a three-part narrative in which I argued:

MAY, PART ONE: There are no inappropriate emergency department visits

JUNE, PART TWO: EM is an essential element of an integrated health care model

JULY, PART THREE: EM provides value

We each have our own intuitive sense that what we do for our life’s work in emergency medicine (EM) matters and provides value. Former Chapter president Fred Dennis (1993-94) pointed out that we provide value when we provide relief from fear for our patients and their families. My mentor and friend Mark Brown has stated that, in addition to the clinical care of EM, much of what we do is about effectively managing patient expectations. Former Chapter president Tom Sugarman (2013-14) has wisely identified the value of the eternal vigilance of our role: always available and at the ready. My personal perspective has always been that our greatest value is in saving lives and reducing suffering.

This year, I have frequently turned to former Chapter presidents for counsel. I decided to take a road trip to Kaweah Delta Medical Center to shadow and kibitz with former Chapter president Wes Fields (2003-04). Chapter Board Member Lori Winston and emergency physician (EP) Linda Herman have developed an excellent EM residency program in a busy district hospital. The appreciative patients, diligent hospital staff, hard working residents, and attending medical staff gave the place a warm vibe of caring and learning. I followed Wes from patient to patient witnessing the blend of clinical, teaching, and people skills that make me proud to be an EP. Between patients we discussed the future value of EM from a health policy and economics perspective. Wes detailed that, in addition to traditional emergency care, EM will be able to provide future value in three key areas: the admit decisions we make, how we manage transitions of care, and how we take ownership for special populations we serve. The following comments are gleaned from our discussion.
In a Rand Study, EP Art Kellermann and his team identified the key role EPs play as decision makers (1). We provide value by identifying sick and injured patients, performing critical actions, and facilitating admission to the hospital. As a result of changes to the practice of medicine, primary care now refers to and depends on EM to perform complex diagnostic workups and to provide unscheduled and after hours care. Consequently, we are the major decision makers for about 50% of all US hospital admissions. The study points that given that the average ED visit costs about $900 and the average cost of a hospital admission is about $9,000, the decisions we make have a great impact not only on patients, health, but on those paying for care. EM, therefore, is in the position to play a critical role in “limiting preventable hospital admissions.” From an economics perspective, EM has a key role in actively managing down hospital bed days. Think about the patients you care for with exacerbations of chronic disease: CHF, COPD, End Stage Renal Disease. To the extent we can work with ED patients and find alternatives to hospital admission, when it is safe to do so, we can have a major economic impact on the cost of care. Given the cost to build a new hospital bed is above $1 million and the aging population, our decisions have increased importance.

Better management of transitions of care is a second key area of EM’s future value. Academic EP Arjun Venkatesh and his team from Yale have studied ED utilization rates for acute unscheduled visits by vulnerable Medicare patients (3). They found that Medicare beneficiaries with multiple chronic conditions, residents of skilled nursing facilities, those enrolled in hospice programs, and Medicaid-Medicare dual eligible patients have ED utilization rates more than twice as high as the average Medicare fee-for-service beneficiary. In fact, for those with multiple chronic conditions and those residing in skilled nursing facilities (SNF), ED utilization rates are more than six times the mean Medicare utilization rate. Fields has described the “low orbit” of the chronically ill Medi-Medi patients moving between EM, hospital medicine, and post acute care providers. The work from Yale illustrates that, to the extent EM physicians become aware of how frequently we see these patients, we will realize we have an opportunity to impact their transitions of care. EPs can sit down with these patients and their decision makers to have a courageous conversation about goals of care, end of life planning, palliative care, and hospice care when appropriate. Often, these conversations are the first opportunity patients and families have to discuss these critical issues with a physician. This can result in a change in the trajectory of intensity of care and admission decisions, leading to care more in line with the patient’s goals. The default of “do everything” is often not inline with patient goals once these discussions take place.

In addition to the SNF population and Medicare patients with multiple chronic conditions, EDs often seem to function as de facto primary care for patients with behavioral health problems, substance abuse problems, and those with housing insecurity. Chapter Board Member Maria Raven has written about the myth of the ED Frequent Flyer (4). In an analysis of New York City Medicaid patients, she reveals that frequent ED users have a high burden of illness that can require emergency care and that their ED care is not a major Medicaid cost driver. She argues the primary care delivery system has thus far failed to find optimal methods to respond to this patient population's needs. Raven seeks to understand those special patient populations as a way to reduce health care costs and achieve better health. She studies super-users, including patients with housing instability and homelessness (many of whom also suffer from mental illness and substance use). Regarding access to care, Fields has stated if you want to reduce health care costs, don’t reduce access to emergency care—increase access to high quality, convenient, and timely primary care and mental health care. Raven and Fields argue EM needs to “own” finding the solutions and implementing the interventions that can help meet the needs of these patients. Their comments about access to care made me think about how great it would be if we all had low barriers to transferring appropriate, medically cleared emergency patients to sobering centers, medical health urgent care centers, and temporary supportive housing. In other words, don’t shut the front door; open the back door.

Midnight came and my ED shift at Kaweah Delta ended. Our discussion about access to care, needs, and EM value reflected the awesome privilege and responsibility we have to our patients and communities. That will be the subject of next month’s article. ■

Thanks,

Larry

REFERENCE:

Halfway Through The Legislative Year:

VICTORIES AND FIXES

Authors: Elena Lopez-Gusman & Kelsey McQuaid, MPA

The 2017 legislative session is in full swing and bills are now being heard in their second house. This legislative session has already proved to be a busy one for emergency medicine. Staff, and physician leadership, has been hard at work to pass our three sponsored bills and to amend problematic legislation.

Some active legislative areas in healthcare this session are: access to care, provider reimbursement, and mental health care.

California ACEP’s three sponsored bills, AB 40 (Santiago), AB 451 (Armbula), and AB 1119 (Limón), have all passed out of the Assembly and are being heard in committee in the State Senate. The following are bills that California ACEP’s advocacy staff has worked to amend to improve the quality of care you are able to provide to your patients.

KEY CALIFORNIA ACEP LEGISLATIVE ACTIONS

**AB 820 (Gipson) and AB 1650 (Maienschein) – Community Paramedicine**

Both bills sought to authorize community paramedicine programs similar to those authorized under OSHPD approved Health Workforce Pilot Project #173. These services include post-discharge follow-up, directly observed therapy for tuberculosis patients, hospice rapid response to avoid transport to an emergency department, case management services for frequent EMS users, and diversion to sobering centers. AB 820 was introduced to authorize several of the alternate destination pilots. We remain committed to ensuring that any program approved to route 911 callers to destinations other than the emergency department (ED), be based on data that proves safety for patients. The bill did not contain sufficient conditions or parameters to ensure patient safety and, as a result, we opposed the bill. AB 1650 was introduced to authorize the other pilots; we opposed unless the bill was amended to ensure replication of the demonstrated programs and include standards for training and safety.

The bills were held and are now two year bills.

**SB 419 (Portantino) – Medical Practice: Pain Management**

SB 419 would have prohibited a healthcare provider from prescribing oxycodone to a patient under the age of 21. While we share the desire to address prescription painkiller abuse, and to prevent addiction and overdose, this bill was not the solution. We opposed this measure...
because it substitutes the Legislature's judgment for the training and experience of a physician using their clinical judgement to best treat the unique circumstances of each individual patient.

SB 419 was held and is now a two year bill.

**AB 334 (Cooper) – Sexual Assault**

AB 334 would have authorized a health care provider to perform a sexual assault forensic medical examination if the alleged victim is unconscious or incapacitated. We had concerns that the bill did not include liability protections for the health care providers completing the exam when a victim cannot consent. We took an oppose unless amended position asking for amendments to provide immunity for collecting rape kit evidence without consent.

AB 334 was amended to remove the portion of the bill we were concerned about. We are now neutral on the bill.

**SB 189 (Bradford) – Workers’ Compensation: Definition of Employee**

Last year, an omnibus bill, AB 2883, was signed into law and has resulted in a substantial increase in workers compensation premium costs, as well as increased administrative burdens, for emergency physician groups in California. AB 2883 sought to close a loophole in worker’s compensation law that was being abused by some companies. It required companies to purchase workers compensation insurance for owners and shareholders. We received feedback from our members that AB 2883 resulted in a dramatic increase in workers compensation insurance premiums for many physician groups.

SB 189 remedies this problem for physician owners who are shareholders. Current law allows partnerships to not purchase workers compensation insurance for partners, so long as each partner signs a waiver.

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The Chapter monitors and works on hundreds of bills each year. If you have any questions about the legislation mentioned here, or in general, please email us at info@californiaacep.org.
OH DEER!

IS IT TIME TO RENEW?

CHECK YOUR MEMBERSHIP INFO AT ACEP.ORG
ADVANCED

WHEN
SATURDAY
SEPTEMBER 23

WHAT
CALIFORNIA ACEP'S
ANNUAL ASSEMBLY

WHERE
THE WESTIN
PASADENA
I’ve observed many physicians over the years and here are five things that everyone should consider to protect their families and maximize their resources, values and goals.

1) MAKING SMART DECISIONS ABOUT MONEY

It’s hard to be an expert on money and easy to make costly mistakes. In order to avoid them you have to understand the tax code, the securities markets, the civil code and the probate code extremely well. It’s hard to do this on top of a full time job, but here are some tips.

If you hire someone look for these things: that they are consultative and they discuss with you all the options you have to pursue your goals, that you get value for your money, that you feel a chemistry with them and like them, and that they are very trustworthy, honest and dependable. These things are the most important factors.

If you want to avoid making mistakes through self management the most useful places to start are reviewing the tax court decisions, reading wealth management trade journals, and reading Bloomberg and other industry periodicals. There are no shortcuts; in terms of making smart money decisions you either have to put in the time or pay someone else who can integrate the factors for you.

Small wins have small impacts over time, the big wins come from integrating all the components together in a complete way and having a completely comprehensive approach to your financial life.

2) MITIGATE TAXES AND MAXIMIZE CASH FLOW

Taxes are an absolute killer for most W2 employees, and your retirement accounts provide the best tax breaks in the system. Carefully consider whether you want to pay taxes on investment gains (a large number at a lower rate) or earnings (a low number at a higher rate). The tax rate alone is not the only factor, you need to carefully consider the amount of money that is subject to tax, which is usually a greater sum under a Traditional account as opposed to a Roth.

Maximizing your cash flow is important, especially as you approach retirement. Most doctors want their cash flow to come from purely income investments, but the tax code actually favors a mix of capital gains (which are taxed at lower rates) and income investments. Also, other states’ municipal bonds can sometimes be a great deal as they sometimes pay higher rates than California but are still exempt from Federal taxes.

3) TAKING CARE OF HEIRS AND MAXIMIZING WHAT YOU CAN PASS DOWN TO YOUR CHILDREN WITH A MINIMUM DEGREE OF DIFFICULTY AND COSTS.

There is a verifiable alphabet soup of trust instruments but the only one you really need to know if you have an estate tax problem is the GRAT (Grantor Retained Annuity Trust). The GRAT allows you to pass capital...
gains to your heirs in your lifetime, while exempting them from the estate tax. Sheldon Adelson used it to pass $480 million of Las Vegas Sands stock, estate tax free down to his children in 2011 – you should know what it is if you are above the estate tax limit of $5.49 million as an individual or $10.98 million as a couple. Most other instruments do not reduce the estate tax and are highly complex and often very costly to administer, but the GRAT can be a cheap, simple, and quick way to transfer assets down to your heirs in a tax efficient way.

Probate fees are completely separate from the estate tax and only apply to what is in your estate at your death. Assets that transfer by beneficiary designation, community property, joint tenancy with right of survivorship, and transfer on death deeds or trusts are not considered to be part of your estate. If after all these assets are swept out, and you have $150k or less left in your estate, you likely qualify for a Simplified Probate Procedure, which is quick, easy and cheap. If you don’t qualify for the Simplified Probate Procedure it can take about 2 years in many counties to settle an estate.

Although they make you feel fancy and special, beware of complicated trust terms and illiquid investments held until your death. It’s worth your time to read some tax cases and see what an awful process it is to unwind illiquid investments or malfunctioning trusts in a probate.

I’ve seen an estate held open for years to try to liquidate a $1.75 limited partnership interest that simply couldn’t be liquidated. I’ve seen an estate take nearly 14 years to close because the trust terms required unanimous consent of all the children to pay estate taxes and one child held out. The wrong trust rights, illiquid investments held to death, and instruments that require too much cooperation of your heirs really do backfire quite a bit, so you should be very careful about adding any of these to your estate plan.

4) MAKE SURE YOUR ASSETS ARE NOT UNJUSTLY TAKEN

You need to protect yourself against litigation, creditors, and catastrophe. Having high limits on your malpractice insurance is the easiest way to protect yourself against your biggest risk.

The other main risks from a lawsuit point of view are causing a bad car accident or someone getting hurt on your property. A good umbrella policy and high coverage limits on your auto and homeowners can really provide good protection, but make sure to read your contract terms.

Finally, young physicians almost certainly want a high quality individual disability policy and a good term life policy, if they have kids. Individual disability policies are easier to claim on since there is a penalty for insurance companies not acting in good faith on the individual market. Fewer protections exist on the group market.

If you plan to have a long wait in between when you pass and when your kids inherit the assets, you may want to consider using the probate process or at least a corporate trustee. The probate/guardianship process is generally bonded, and the assets are supervised by a judge. On trusts, the assets are generally not watched closely by the courts and so it is easier for a trustee to steal assets in a trust than in a probate.

5) CHARITABLE PLANNING AND MAKING MEANINGFUL CONTRIBUTIONS TO CHARITIES YOU CARE ABOUT

The highest yield option here in my view are the donor advised funds available at many brokerage houses or beneficiary designations on your accounts. There are a number of charitable trusts such as the charitable lead trust or charitable remainder trust, that involve giving assets to a charity today or at your death.

Charities like them because it doesn’t feel like you are giving the money away (even though you are and you can’t get it back) and lawyers like them because it creates a demand for a trust instrument. However, unlike a GRAT, in my view, they don’t actually do anything that you couldn’t do yourself less expensively and more simply by just giving to charities at your death.

These are the five things to know about the financial system that I see come up over and over again for the physicians I’ve observed over the years. Whatever you do, you’ll benefit from doing it in an integrated way so that your insurance, tax mitigation, investment strategy, and legal/creditor protections are all working in an integrated way to meet your goals.

It goes without saying I’m not your lawyer or financial advisor. These ideas are just a place to start the thought process, but you need to consult your own professional advisors or do your own research to verify this information before making any decisions.

ABOUT THE AUTHOR:

Daniel Harris is the President of D.R. Harris & Co., and has worked with many physicians on wealth management issues over the years. He is a graduate of Stanford and UC Berkeley School of Law and has seen over $1 billion in transactions so far in his career. His firm, D.R. Harris & Co., has been in business for over 8 years.
TELEHEALTH-ENABLED Emergency Medical Services Program Reduces Ambulance Transport to Urban Emergency Departments

INTRODUCTION: Emergency medical services (EMS) agencies transport a significant majority of patients with low acuity and non-emergent conditions to local emergency departments (ED), affecting the entire emergency care system’s capacity and performance. Opportunities exist for alternative models that integrate technology, telehealth, and more appropriately aligned patient navigation. While a limited number of programs have evolved recently, no empirical evidence exists for their efficacy. This research describes the development and comparative effectiveness of one large urban program.

METHODS: The Houston Fire Department initiated the Emergency Telehealth and Navigation (ETHAN) program in 2014. ETHAN combines telehealth, social services, and alternative transportation to navigate primary care-related patients away from the ED where possible. Using a case-control study design, we describe the program and compare differences in effectiveness measures relative to the control group.

RESULTS: During the first 12 months, 5,570 patients participated in the telehealth-enabled program, which were compared against the same size control group. We found a 56% absolute reduction in ambulance transports to the ED with the intervention compared to the control group (18% vs. 74%, P<.001). EMS productivity (median time from EMS notification to unit back in service) was 44 minutes faster for the ETHAN group (39 vs. 83 minutes, median). There were no statistically significant differences in mortality or patient satisfaction.

CONCLUSION: We found that mobile technology-driven delivery models are effective at reducing unnecessary ED ambulance transports and increasing EMS unit productivity. This provides support for broader EMS mobile integrated health programs in other regions. [West J Emerg Med. 2016;17(6):713-20.]

INTRODUCTION

Background

Emergency medical services (EMS) plays a vital role in the appropriate prehospital management of the nearly 250 million 911 callers each year. Both emergency departments (ED) and EMS agencies are increasingly resource-constrained, threatened by the increasing number of ambulance transports often associated with non-urgent complaints. Most EMS protocols require the transport of all 911 patients to the ED and lack incentive to transport patients to possibly more appropriate settings. As a result, resource costs are high through unnecessary transport and ED care for non-urgent primary care patients. A nationwide study estimated that the proportion of medically unnecessary EMS transports has increased 31% from 1997 to 2007 (from 13% to 17%), supporting the need for alternative models of EMSprehospital care.

The American College of Emergency Physicians concludes that ambu-
lance non-transport as well as transportation to alternate destinations may be appropriate for non-urgent patients. The same report contends that EMS systems choosing to implement such options “should develop a formal program to address these alternatives” and should occur only under physician oversight, combined with adequate education of EMS providers and a strong quality management system. Approximately 7% of EMS agencies serving the 200 largest cities in the U.S. have implemented policies allowing EMS-initiated non-transport of patients. However, there is a limited amount of research determining the safety and effectiveness of these programs.

Programs that combine non-traditional techniques and technologies to redeploy units and more appropriately align patients to alternative destinations are conceptually termed “mobile integrated health” (MIH) or “community paramedicine” (CP). The difference in the models is the deployment of personnel and technology. Mobile integrated health involves technology utilization, and is defined as “the provision of healthcare using patient-centered mobile resources in the out-of-hospital environment.” Community paramedicine describes the expansion of EMS personnel roles and responsibilities more broadly in public health and healthcare delivery. Collectively, these are alternatives to traditional EMS treat-and-transport models. Alternative models tend to emphasize technology, non-ambulance-based transportation, and broader paramedic roles and responsibilities to “reduce total cost of care, provide more patient-centered care, and reduce the burden on EDs.” Most patient-centered alternative models include technology to support telehealth.

Telehealth has typically been performed in rural areas or for specialized diagnoses, providing care remotely to patients that otherwise would not receive any. Formally, telehealth is the use of electronic communication to facilitate patient care between a patient and a provider working at a distance.

**Significance**

Non-urgent, primary care-related incidents severely hamper the current emergency medical care system. The potential benefits of an alternative mobile integrated health program include enhancement of resource utilization, reduction of unnecessary ED visits that contribute to crowding and access to care. Schaefer et al. reported a 7% reduction in ED use and 3.5% increase in community clinic use in the post-phase implementation of an alternate destination program for selected non-urgent patients. In a similar evaluation of an alternate destination program in the United Kingdom, Snook et al. reported reduced waiting times, increased patient satisfaction, enhanced resource utilization, and shortened cycle times for ambulance services. Other studies have shown the safety of alternate methods of transport (e.g., taxi) and effectiveness of physician-directed destination programs to reduce crowding.

Although there are a few documented studies of EMS alternative programs and telemedicine pilots, these are often in rural settings or in small demonstration projects. Other emergency researchers have pointed to a significant need for more comparative effectiveness studies of large-scale MIH programs.

**Study Objective**

The objective of this research is to compare the effectiveness of an alternative EMS telehealth delivery model relative to traditional EMS care in a large urban, American city.

**METHODS**

**Study Design**

We developed an observational case-control study between two groups of patients who placed emergency medical calls to 911. The intervention group (ETHAN patients) incorporated telehealth with community paramedicine, and dispositioned patients to the most appropriate level of care (e.g., hospital ED, local safety net clinic with prepaid taxi voucher, or referrals to primary care). The control group was comprised of traditional EMS patients treated and transported to local EDs per standard protocol. We measured the effect differences across a number of different measures.

**Study Setting**

With a population of more than 2.2 million, the City of Houston covers an area of over 600 square miles in Southeast Texas. The city’s emergency medical services (EMS) is a division of the Houston Fire Department. Houston EMS receives over 250,000 emergency calls every year. As a fire-based EMS department, a two-person unit will respond to all EMS calls in one of the 63 ambulances, 89 engines, 39 ladder trucks, or 35 medic response vehicles located at 93 fire stations across the region. EMS services benefit all of the city’s residents, and frequently support those most in need, such as low-income mothers and children, the elderly, and Medicaid and minority populations. The program serves the region’s primary EMS population, which is comprised of approximately 30% Medicaid enrollees and 20% indigent patients.

This demand for emergency services has steadily risen over the past decade and continues to increase. Recognizing the rising costs of treating patients with non-emergent conditions, the City of Houston Department of Health and Human Services, received funding from the 1115 Medicaid Waiver pool to develop an intervention program (ETHAN), aiming to reduce the number of potentially unnecessary ambulance transports and ED visits. Initial investment of $500,000 was used for capital equipment, including the telehealth and tablet hardware and software. Approximately $1,000,000 per year for five years will also be used to cover all operational expenses of the program. The proposal was to incorporate telecommunications technologies to triage patients with non-life-threatening, mild or moderate illnesses via telemedicine with an emergency physician at the Houston Emergency Center. The EMS/paramedic on the scene would be responsible for making the determination of whether or not the situation warranted a triage intervention. If not, and the patient met inclusion criteria listed below, they would be eligible to be enrolled into the program. The paramedic would then activate ETHAN through an online call button on the tablet, which contacts the emergency physician in the base station immediately for a consultation. If the treating physician determines that the patient did not need immediate medical attention, the patient receives a referral for the same or following day.

**Sample Determination and Participant Selection**

Sample size was calculated assuming 80% power and significance level 0.05, for continuous data. We chose reduction in ambulance transportation as our primary effect, and aimed to detect a difference of 0.10 between ambulance transports for our intervention participants, assuming that the base rate of transport was 78%. We calculated...
Each patient who received the intervention was matched retrospectively with a similar patient identified in the patient care record (PCR) system as a control. The patients were matched during the same period, based on individual factors, including similar primary care chief complaints, age, and gender. We matched 100% of the cases with controls, to have the identical size samples in each group. This study design allowed us to compare outcomes (e.g., % ambulance transport, as well as other clinical, economics, patient satisfaction) relative to a similar set of traditional EMS patients.

Patients selected for the program had to meet inclusion criteria, as determined by the field paramedics at time of triage. Inclusion criteria for this study were patients with full mental capacity presenting with chief complaints that were primary-care related. The most common complaint categories system were “abdominal pain,” “sick,” “injury/wound,” and “other pain.” Patients had to consent to speaking to a physician, have no obvious emergency present and vital signs within reasonable limits, and they had to be ambulatory and mobile. Inclusion criteria included the following:

- Full history and physical exam, no emergency
- Ages > 3 months
- Ability to communicate and to speak English
- Vital signs are age appropriate and within normal limits
- Chronically ill patients or persons over age 65 years may not have a fever
- Ability to care for self
- Transported in a passenger vehicle
- Pediatric patients must have access to a pediatrician.
- We excluded patients if there were any urgent issues such as chest pain, acute neurological changes, or altered mental status. Other exclusion criteria included the following:
  - Ongoing difficulty breathing
  - Chest pain or discomfort
  - Any acute neurological change
  - Syncopeal episode in the past 24 hours
  - Temperature of >100.3 if chronically ill or 65+
  - Non-trivial traumatic injury in a patient <18
  - Any pediatric patient when non-accidental injury or neglect is suspected
  - Any pediatric patient <18 years who has no legal guardian on site
  - Any patient who refuses to participate

**Intervention Protocol**

The intervention consists of the following three components:
1) telehealth capabilities between the paramedic, patient, and an EMS physician; 2) patient navigation and scheduling to contracted safety net clinics, if possible; and 3) taxi transportation and social service follow-up post incident. The intervention initiates when the first responding apparatus arrives at the incident scene, and the crew assesses the patient to make an initial determination as to the emergent status of the patient’s condition. The figure shows the study protocol flowchart.

All EMS units carried tablets to connect the patient with an emergency physician via HIPAA-compliant and secure video teleconferencing software. Telehealth services involved synchronous communication with the patient through video conferencing on the tablet. The emergency physician was able to access the patient’s medical record created at the scene, including patient’s demographics, vital signs, medical history, allergies, medications, and chief complaint. Although the community health information exchange system was available, the lack of available data for most patients prevented it from being used to access the previous hospital records of patients. The physician consulted with the patient through the tablet, and made a determination of preliminary diagnoses and treatment options.

The EMS physicians were board-certified emergency physicians who practice at local hospitals EDs and contracted for part-time shifts at the Houston Emergency Center specifically for telehealth calls. There are approximately 16 physicians employed, all with at least five years of experience and practice in one of the local hospitals. All except for the program director (who was also an MD) were contracted part-time employees working at least one shift, and the hourly compensation was between $160-$200. There was one physician on duty at all times from 8 am to 9 pm, five days per week, and 10 am to 6 pm during the weekends. Physicians were given a desk with both a computer enabled with camera and access to multiple software solutions, in-
including the EMS patient care record (PCR) system, a clinic scheduling system, taxi activation links, and the health information exchange. All physicians were municipal employees under the City of Houston, and were covered for liability and malpractice under the city’s sovereign immunity law.

Training for the telehealth and navigation program lasted four hours, where the physicians were given technical training and instructions on the goals and objectives of the study. During the training period, the physicians test all technology components, observe multiple calls in progress, and then take calls under the supervision of a more experienced physician. Following this training, they were independent going forward, although weekly feedback and outcomes were shared by the program director.

While the video encounter was taking place, the field crew remained on scene to assist the physician with any additional information needed, such as taking a new set of vital signs or palpating the patient’s pain site. The physician, in consultation with the patient, made the final determination regarding patient disposition. Patient’s preference and input often led to the disposition to an ED rather than a clinic (although in a taxi versus ambulance). We saw no differences in patient diagnosis for those dispositioned to the ED versus a clinic.

The median number of minutes for a telehealth call was eight minutes, but ranged from 2-40 minutes (interquartile range). Since the ability to speak English was an inclusion criterion, all telehealth calls were in English as well.

Outcome Measures
The objective of this study was to explore the relative effectiveness of a large MIH program focused on primary care-related patients, relative to traditional EMS. The primary outcome measure was utilization, measured as the proportion of ambulance transports to the ED. Ambulance utilization is considered important as it impacts local hospital EDs’ crowding, wait times, and access.

Another primary outcome metric was unit productivity, as that ultimately influences total cost of care. This was calculated as the total “back in service” time, measured by the difference in minutes between when the unit was dispatched and the unit became available to respond to a subsequent incident. Generally, the quicker the unit is available and put back in service, the more productive the crew and the ambulance. Utilization is greater if units terminate the call after initial review and observation, rather than disposition to an ED, which often requires long transport and transition times. While cost was not directly studied here, an ongoing health economics study is estimating the program’s total cost of care. Secondary measures we chose to include were quality of care (measured by mortality rates), and the experience of care (measured as post-incident patient satisfaction).

Primary Data Analysis
We extracted all patient demographics, interventions, treatment times, dispositions, and outcomes data from the PCR system used by Houston Fire Department. We obtained all patient data in the program from January 1, 2015, through December 31, 2015, and de-identified the data after abstraction. Data were validated in a database using scripts to ensure completeness of data for all cases. We used both operational and information systems personnel at Houston Fire Department to ensure that all extracted data for both cases and controls were accurate and complete prior to inclusion in the dataset for analyses. We used descriptive analyses to determine frequencies and central tendencies. Continuous outcomes, unless otherwise stated, were compared between treatment groups with t tests. Time data were highly skewed and therefore the nonparametric Mann Whitney U test assessed median differences. We used SPSS to perform data analysis (SPSS Statistics, version 23, Armonk, NY: IBM Corp.).

This comparative effectiveness study was reviewed and approved by the institutional review board at the University of Texas Health Science Center at Houston.

RESULTS
During the study period, 5,570 patients participated in the intervention program. There were 288,000 total EMS calls during that period. Table 1 shows the descriptive characteristics of the patients in the intervention and the matched control group.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>58%</td>
<td>60%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>All Others</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Matched measure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median age, IQR, y</td>
<td>44 (10)</td>
<td>45 (10)</td>
</tr>
<tr>
<td>Sex % female</td>
<td>55%</td>
<td>51%</td>
</tr>
<tr>
<td>Top 3 chief complaints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% “Abdomen pain”</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>% “Sick”</td>
<td>25%</td>
<td>29%</td>
</tr>
<tr>
<td>% “Breathing”</td>
<td>20%</td>
<td>18%</td>
</tr>
</tbody>
</table>

EMS, emergency medical services; IQR, interquartile range

We found a statistically significant change in alternative transport options, with a 56% absolute decrease in transport to the ED (74% for control group vs. 18% for intervention; P<.001). In the control group, the 26% (which did not go to the ED) ended up as non-transport. Of the non-ambulance transports, most intervention patients (n=3,293, 72% of non-transport) were offered a pre-paid taxi ride to go to a local hospital ED independently. Approximately 83% of these actually used the taxi and presented to the ED (2,733). This disposition was appropriate where patients might need care not offered by a clinic, but were not emergent enough to require immediate ED care.

There were 458 patients (8%) scheduled into one of the geographically proximate safety net clinics, usually within the day or next business day. The EMS physician was successful in securing appointments for 100% of these patients, although only 55% of them actually presented to the clinics (i.e., 45% no-show rate). There was patient follow up by
ED, emergency department; PCP, primary care provider

telephone within a week to inquire about their appointment, and most reported their symptoms subsided as reason for missing appointment. Based on the diagnosis, we had no reason to believe that mortality was a cause for patient no-show.

Fourteen patients made a follow-up call after referral to the primary care clinic for an incident within a two-day time period (<.2%), resulting in a subsequent EMS response. The remainder were referred to the patient’s own primary care physician or home care, refused care, or were provided home care instruction only. Approximately 7% (259 patients) declined to speak to an EMS physician by telehealth in the intervention group, or refused referrals to clinics, or technical or other issues prevented one of the other dispositions. Of these, technical issues represented only around 50 calls, which was primarily due to lack of wireless cellular signal in certain regions of the city. Table 2 presents the disposition rates for the intervention.

Patient satisfaction was recorded by follow-up telephone services from the City of Houston Health and Human Services caseworkers for both ETHAN and non-ETHAN patients. We attempted to contact 100% of the intervention patients by telephone, but we received approximately 10% completed survey response rate, primarily due to inactive or erroneous telephone contact information. We sampled 10% of the control group to ensure the same sample size. There was no difference in “overall satisfaction with care delivered by EMS,” with ETHAN patients reporting an 88% overall patient satisfaction rating for the EMS response, compared to 87% for the non-intervention group (p=.25). There were 10 survey questions, but the satisfaction rating used here was based on the response to the question “Overall, on a scale of 1 – 100 (where 100 is the best), how would you rate your level of EMS care?”

Since these were primary care-related incidents, there were zero mortalities reported in either of the groups during the prehospital phase for either the intervention or control groups, and consequently there was no significant differences in that measure between groups.

Most significant were the differences in EMS productivity. The median response time (from EMS notification from 911 to unit back in service time) was 39 minutes for ETHAN patients, and the median response for the control group was 83 minutes. This 44-minute reduction in medians between the groups is statistically significant (Mann Whitney P<.001). This equates to approximately 2.1 times greater utilization (dispatches per day) for the EMS unit than the standard EMS control group, resulting in significantly lower cost of care.

Table 3 summarizes the outcome results.

**LIMITATIONS**

There are several limitations to this study. An important one is the lack of randomization. Given the nature of the study and the practicality of EMS response, we used a case-control observational design. There are obvious inherent limitations in the selection of the control group, although we made every effort to match the patients based on age, gender, approximate dates, and chief complaint. In addition, this study uses data extracted from multiple components of a PCR system. As with all patient record systems, the accuracy and quality of the data entered by field crews may be inaccurate or incomplete. We incorporated multiple special precautions for ensuring data quality and validity of the dataset to mitigate this limitation, including oversight from both operational and information technology personnel at the fire department.

Another limitation is that this study represents only a small subset of total EMS calls in this large city (roughly 1.9% of all calls in 2015). Since it was designed as a pilot study to assess feasibility and relative effectiveness on measures of ambulance utilization and EMS productivity, future period will use greater sample sizes. Lack of comprehensive data on post-EMS response outcomes is also a limitation. Although we found no reported deaths, we were not able to do a comprehensive

---

**TABLE 2. Patient disposition intervention in an emergency telehealth and navigation program (ETHAN).**

<table>
<thead>
<tr>
<th>PATIENT DISPOSITION</th>
<th>N</th>
<th>% OF TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital ED with taxi</td>
<td>3,293</td>
<td>59%</td>
</tr>
<tr>
<td>Ambulance transport to ED</td>
<td>1,013</td>
<td>18%</td>
</tr>
<tr>
<td>Clinic referral with taxi</td>
<td>458</td>
<td>8%</td>
</tr>
<tr>
<td>Referral to PCP or home care</td>
<td>419</td>
<td>8%</td>
</tr>
<tr>
<td>Others (refusals, technical issues; no transport or referral)</td>
<td>387</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Total Sample</strong></td>
<td>5,570</td>
<td>100%</td>
</tr>
</tbody>
</table>

**TABLE 3. Outcome differences comparison in a pilot program that integrates mobile technologies and alternative patient navigation to improve EMS utilization and outcomes.**

<table>
<thead>
<tr>
<th>OUTCOME CATEGORY</th>
<th>MEASURE</th>
<th>CONTROL GROUP</th>
<th>ETHAN (INTERVENTION)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulance utilization</td>
<td>Disposition to ED by ambulance (% ambulance transport)</td>
<td>74%</td>
<td>18%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Unit productivity</td>
<td>Total back in service time median minutes (IQR)</td>
<td>83 (20-140)</td>
<td>39 (27-90)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Quality of care</td>
<td>Mortality</td>
<td>0%</td>
<td>0%</td>
<td>NA</td>
</tr>
<tr>
<td>Experience of care</td>
<td>Patient satisfaction</td>
<td>87%</td>
<td>88%</td>
<td>.250</td>
</tr>
</tbody>
</table>

ETHAN, Emergency Telehealth And Navigation Program; ED, emergency department; IQR, interquartile range
search of all patients that might have died after the EMS response. We were not able to determine the effect of the ETHAN program on ED crowding across more than 60 hospitals with 1.4 million ED visits. Finally, there were few technical limitations of this telehealth system, although a very small subset of calls were aborted due to poor wireless cellular signals required to use the paramedics’ tablets in patients’ homes. As wireless networks continue to improve in the region, this should be less of an ongoing problem over time.

**DISCUSSION**

To our knowledge, this study represents one of the largest, urban efforts at integrating mobile technologies and alternative patient navigation to improve EMS utilization and outcomes. As suggested by other researchers, there is a clear need for more effectiveness studies from mobile integrated health programs in emergency medicine, to explore their development and the results they produce. The results presented here offer insight into the overall effectiveness of a large-scale program currently underway.

As populations continue to grow, municipal resources shrink, and hospital EDs continue to have limited capacity, the demand on traditional EMS will create significant problems. Alternative models, through mobile integrated health and community paramedicine, offer potential to improve EMS utilization while maintaining quality of care and better aligning patients with the appropriate level of care. Around the country, multiple demonstration projects are underway, but little evidence exists to support their impact on care delivery.

In this research, we found that the integration of a telehealth-based initiative with patient navigation to more appropriate care levels, creates significant reduction in ambulance-enabled ED utilization. Specifically, we found that the program resulted in a median 44-minute reduction in the unit back in service time (39 vs. 83 minutes). This equates to roughly 2.12 times greater productivity. We also observed a significant reduction in ED ambulance transports, from 74% to only 18%. These results come with little or no significant impact on clinical quality or patient satisfaction.

This study confirms that potentially unnecessary ambulance transports to the ED can be significantly reduced, which has significant financial and utilization impact on EMS agencies. We surmise that use of community paramedicine combined with telehealth and other mobile technology has potential to improve both EMS agency and overall emergency system capacity.

There are interesting financial consequences of this research. According to the Centers for Medicare and Medicaid, of the 107 funded “Health Care Innovation” awards, which recently ended their three-year funding term, only a few involve EMS. Based on our findings, we suggest that a significantly greater number of programs be implemented in rural and urban, large and small communities, to create meaningful change nationwide.

Implementing these programs will not be easy, and there are a number of barriers to alternative EMS models. Lack of reimbursement for non-ED transports is clearly significant. Medicare currently does not provide reimbursement unless the patient is transported to the ED. Although researchers have called for payment policy reform to include broader ranges of EMS transport options, they have not yet been adopted. In addition, the lack of reliable field triage criteria and paramedic assessment of medical necessity creates barriers. However, technological advancements such as telemedicine, real-time telemetry, and electronic health information exchange (HIE) have made it feasible for paramedics in the field and remotely located physicians to accurately assess, safely manage, and determine resource-efficient courses of action for patients. Reimbursement mechanisms for more proactive, alternative models of EMS deployment as well as telehealth will also need to be developed.

The evolution of mobile integrated health programs in EMS has developed rapidly. Within the last five years, dozens of programs have evolved to reduce ED utilization, unnecessary ambulance transports, and improve overall outcomes. The productivity gains we observed in this study should offer evidence to support further innovations in EMS as well as change in policy and reimbursement practices.

We contribute to the literature by providing comparative effectiveness research from one of the largest EMS agencies in the country.

**CONCLUSION**

A telehealth-enabled emergency medical services program reduced unnecessary ambulance transports by 56% to urban emergency departments, and put paramedic units back in service an average of 44 minutes faster.
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Conflicts of Interest: By the WestJEM article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. The authors disclosed none.

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REFERENCES

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The California Emergency Medicine Advocacy Fund (CEMAF) has transformed California ACEP’s advocacy efforts from primarily legislative to robust efforts in the legislative, regulatory, legal, and through the Emergency Medical Political Action Committee, political arenas. Few, if any, organization of our size can boast of an advocacy program like California ACEP’s; a program that has helped block Medi-Cal provider rate cuts, lock in $500 million for the Maddy EMS Fund over the next 10 years, and fight for ED overcrowding solutions! The efforts could not be sustained without the generous support from the groups listed below, some of whom have donated as much as $0.25 per chart to ensure that California ACEP can fight on your behalf. Thank you to our 2015-16 contributors (in alphabetical order):

- Alvarado Emergency Medical Associates
- Antelope Valley Emergency Medical Associates
- Beach Emergency Medical Associates
- Berkeley Emergency Medical Group
- Centinela Freeman Emergency Medical Associates
- CEP America
- Chino Emergency Medical Associates
- Coastline Emergency Physicians Medical Group
- Culver Emergency Medical Group
- Eden Emergency Medical Group
- Hollywood Presbyterian Emergency Medical Associates
- Mills Peninsula Emergency Medical Group
- Montclair Emergency Medical Associates
- Napa Valley Emergency Medical Group
- Orange County Emergency Medical Associates
- Pacific Coast Emergency Medical Associates
- Pacific Emergency Providers
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- San Dimas Emergency Medical Associates
- Sherman Oaks Emergency Medical Associates
- South Coast Emergency Medical Group, Inc.
- Tarzana Emergency Medical Associates
- TeamHealth
- Temecula Valley Emergency Physicians, Inc.
- US Acute Care Solutions
- Valley Emergency Medical Associates
- VEP Healthcare, Inc.
- Valley Presbyterian Emergency Medical Associates
- West Hills Emergency Medical Associates

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ADVANCED 2017
September 23, 2017, The Westin Pasadena, Pasadena, CA

CALIFORNIA ACEP CO-SPONSORED CONFERENCES
40th Annual Emergency Medicine in Yosemite
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Ohio ACEP Emergency Medicine Board Review Course
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For more information on upcoming meetings, please e-mail us at info@californiaacep.org; unless otherwise noted, all meetings are held via conference call.

## JULY 2017

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
</table>
| 3rd - 4th | Independence Day Holiday  
Chapter Office Closed          |
| 11th at 9am | Reimbursement Meeting  
Conference Call                |
| 13th at 10 am | Government Affairs Committee  
Conference Call              |
| 24th | Legislature’s Summer Recess Begins                      |

## AUGUST 2017

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
</table>
| 16th - 17th | Chapter Board of Directors Retreat  
Sacramento, CA                 |
| 21st | Legislature Reconvenes                                   |

## SEPTEMBER 2017

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Legislation Fiscal Deadline</td>
</tr>
</tbody>
</table>
| 4th | Labor Day Holiday  
Chapter Office Closed                                       |
| 15th | End of 2017 Legislative Session                         |
| 22nd | Chapter Board of Directors Meeting  
Pasadena, CA                                                  |
| 23rd | Chapter annual conference: ADVANCED 2017  
Pasadena, CA                                                   |
DOWNTOWN LOS ANGELES: Emergency Physician needed. $350,000 + incentive per year, malpractice paid, half days, half nights. ABEM ABOEM with experience. Present core group average 23 yrs tenure. 36,000 annual visits, paramedic receiving (no pediatrics) STEMI Stroke, physician coverage 36-40 hrs/day, NP & PA coverage 12-20 hrs/day.

FAX CV to 213 482 0577 or call 213 482 0588 or neubauerjanice@gmail.com

NEWPORT BEACH, CALIFORNIA: Newport Emergency Medical Group is accepting applications from Board Certified or eligible Emergency Physicians for a Full Time position. Newport Emergency is a democratic, independent group associated with Hoag Hospital since 1981. The Hoag Irvine ED averages 100 patients per day and is staffed with 4 overlapping EDMD shifts and 3 PA shifts per day. Scribes assist each provider. SCM EMR will transition to EPIC over the next year. A partnership track is available. The ED is being expanded to double capacity to 36 beds with completion scheduled for 8/18. Acceptable applicants will be contacted to discuss the position in detail.

Send indication of interest and CV to RayRicciMD@me.com

SOUTHERN CALIFORNIA: LA/OC area single hospital democratic group 40+ year contract holder with low turnover seeks BC/BE Emergency Physician for FT/PT position. We are a STEMI/Stroke Receiving Center with an 80K/year census. We have 24/7 in-house hospitalist and intensivist coverage along with a NICU and FP residency. The ED has 60 beds including Fast Track with PA/NP coverage, provider in triage, Scribes, and triple physician coverage during peak hours. Competitive compensation with night differential, paid malpractice, and educational support.

Email CV to iemg@dslextreme.com or Fax to 562-945-5283

SOUTHERN CALIFORNIA OPPORTUNITIES:
- Tustin, CA - Orange County - 73-bed community hospital, 8-bed ER, paramedic receiving, low volume. 10 x 24hr = $240,000/yr + incentive
- East Los Angeles - 120-bed community hospital urgent care (non paramedic receiving) volume 700/mo. Guarantee $100/hr.
- Norwalk, CA - 60-bed hospital. 500-600 patient/mo. Paramedic receiving. $110/hr.

FAX CV to 213 482 0577 or call 213 482 0588 or email neubauerjanice@gmail.com

VENTURA CALIFORNIA: New hospital under construction and scheduled to open in the fall of 2017. Central coast of California and 70 miles from LAX. Positions available in two facilities for BC/BE emergency physician. STEMI Center, Stroke Center with on-call coverage of all specialties. Teaching facility with residents in Family Practice, Surgery, Orthopedics and Internal Medicine. Admitting hospital teams for Medicine and Pediatrics. Twenty-four hour OB coverage in house and a well established NICU. Physician's shifts are 9 hrs and 12 hours of PA/NP coverage. All shifts and providers have scribe services 24/7. Affiliated hospital is a smaller rural facility 20 minutes from Ventura in Ojai. Malpractice and tail coverage is provided. New hires will work days, nights, weekends and weekdays.

Send resume to Alex Kowblansky MD FACEP at kowblansky@cox.net

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Email: Kurgan911@comcast.net

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Web: www.cce.csus.edu

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Toll-Free: (800) 700-6444
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Email: mthomas@emergencytraining.com
Web: www.emergencytraining.com

Loma Linda University Medical Center
Lynne Jones, Administrative Assistant
Department of Emergency Medicine
11234 Anderson St, A108, Loma Linda, CA 92354
Phone: (909) 558-4344 x 0
Fax: (909) 558-0102
Email: LJones@ahslumm.edu
Web: www.llu.edu

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Fax: (707) 644-1784
Email: jpierson@medicambulance.net
Web: www.medicambulance.net

Napa Valley College
Gregory Rose, EMS Co-Director
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Phone: (707) 256-4596
Email: grose@napavalley.edu
Web: www.winecountrycpr.com

NCTI – National College of Technical Instruction
Lena Rohrabaugh, Course Manager
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Email: jlcasa@caltel.com
Web: www.ncti-online.com

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Fax: (510) 238-6950
Email: sean@bcyc.com
Web: http://www.oaklandnet.com/fire/

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Fax: (209) 550-0885
Email: gpierce@philhelico.com
Web: www.phialmedical.com/

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Web: www.riggsambulance.com

Rocklin Fire Department
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Fax: (209) 725-7044
Email: Chris.Wade@rocklin.ca.us
Web: www.rocklin.ca.us

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Web: www.metro.com

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