A Roadmap for the Student Pursuing a Career in Pediatric Emergency Medicine

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Welcome new members!

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Emergency departments (ED) should always be synonymous with the presence of a residency trained and board-certified emergency physician. Since our specialty’s birth back in 1979, it has been a long-waged battle to have Emergency Medicine recognized by the house of medicine, legislators, and regulators. Through countless efforts by the American College of Emergency Physicians (ACEP) and the California Chapter, it is now the expectation of patients that they see an emergency physician at the helm when they arrive in an ED.

Despite our remarkable, successful cultural change in just 50 years, this core issue is now facing new challenges by advanced practice providers pushing to provide unsupervised care in all health care landscapes, including in EDs. As we prepare to address this challenge to our specialty and practice, I believe it is important to realize that ED-based practice is not our sole practice setting. What makes us unique is the reach, expertise, and value we bring to healthcare that goes beyond the concrete walls of an ED.

During my presidential address (scan QR code to watch), I emphasized emergency physicians as superheroes. We are trained in EDs, but what we gain through this training experience is expertise in all aspects of unscheduled acute care medicine. National ACEP currently has 40 sections: 16 deal with clinical practice outside of an ED. This should not come as a surprise given that emergency physicians helped bring about the birth of EMS, 911, and toxicology. We parallel other specialties that perform critical care medicine or palliative care medicine. Our quick thinking and our ability to maximize limited resources makes us disaster, event, international, and wilderness experts.

My personal journey on this subject has also been evolving. Back in 2019, I decided to move from Sacramento to San Diego for family reasons. In doing so, I left a job and department I was fortunate enough to call home for seven years. It was my ideal job. A democratic group with a constant focus on the diversity of emergency medicine practice to ensure career longevity and physician wellness. This included, in any given month, shifts in the department that were varied between high, medium, and low acuity care. There were also shifts outside the physical department in observation medicine and acute care telemedicine.

While preparing for my move to southern California, I reached out to my CalACEP colleagues in San Diego to inquire about practice opportunities in the county. I kept noticing a recurring theme. While all of them were doing shifts in EDs, many were splitting their clinical time in either urgent care settings or working some hours from home practicing acute care telemedicine. All of them encouraged me to explore some of these alternative practice locations as I built my monthly schedule. Admittedly, my initial reaction was “I am an emergency physician, I belong in an emergency department.”

As I kept exploring what was driving all these physician colleagues to these alternative practice environments, I realized it was exactly what made me cherish my previous employment. For career longevity and wellness, they were diversifying their practice environments. This let them balance the stress, sleep disturbance, and the emotional toll that high acuity ED practice can take on us. I asked each of them, “but surely there must be a catch in the terms of compensation?” Each re-assured me that there was no decrease in their overall annual compensation,
and for some, they were noticing a higher compensation with less burnout. One benefit they noted was being able to connect with their patients in a meaningful manner they did not always feel was accomplished in the ED.

There is no other physician specialty that can match our knowledge and ability to quickly assess, guide, and treat patients of all ages in acute care medicine. While this may have once been the role of primary care physicians, now it is dominated by emergency physicians. We know what an appropriate treatment within the constraints around us is and how to run these systems to maximize efficiency and appropriate care. We also appropriately understand the limits of any given resource and when to advance to higher level care areas. Health care systems are seeing value in this. They have learned that placing an emergency physician in this space brings cost-effective efficiency and resource utilization. In addition, patients appreciate receiving care from an emergency physician without having to always travel the distance to an ED, feeling rushed in their care, or paying the co-pays or high deductibles that may come with a hospital visit.

Taking the advice of others and wanting to experience firsthand these alternative practice environments, I began practicing in three environments in San Diego. First, I knew the importance of continuing ED care and keeping an intimate knowledge of high acuity medicine. Second, I decided to explore the idea of acute care telemedicine but did not dive in until the pandemic hit. Lastly, I joined 13 board-certified emergency physicians in a high functioning urgent care.

This is not the urgent care many of us think of with a point of care lab analyzer and maybe an x-ray machine. This 14-bed urgent care has a full lab on site with radiology capability including x ray, ultrasounds, CTs, and MRI. Thanks to hospital and transport agreements, medium to even high acuity work ups for abdominal pain, chest pain, and sepsis occur with direct admissions, when needed.

While acute care telemedicine was born years before COVID-19, demand for it has accelerated with the pandemic as patients are seeking care while balancing exposure risks. Many of us jumped in to assist with the surge and subsequently challenged the dogmas of what could be cared for virtually. In some cases, the diagnosis and treatment is easily achieved, but in others the value add is appropriately and quickly guiding the patient to the next step. For example, I recently had a telemedicine consultation with a patient about a finger infection requesting antibiotics. But after diving into her complaint further with follow up questions, I had a significant concern for extensor tenosynovitis. I was able to highlight my concerns and recommend that she head to her nearest ED, rather than an urgent care. Initially she was hesitant, but stated she felt confident in my decision because I was an emergency physician. I highlighted that I hoped I was wrong, but she deserved an in-person exam. A week later I heard back from her that she took this advice, promptly had the diagnosis confirmed, and was taken to the operating room for surgical management. She was very appreciative of my expertise and the services of telemedicine. Regardless of what happens with the pandemic, patients are realizing quick access to emergency physicians allows them to either be treated or referred to the appropriate treatment location when needed.

I have learned through both these experiences that I am still, and will always be, an emergency physician no matter where I practice.

It is important that we recognize and support our colleagues in the diversification of practice environments. As CalACEP and national ACEP continue to advocate on your behalf, it is equally important for our organizations to understand the areas that each of you are touching on a daily basis and the challenges associated with each. This should be a two-way street.

As an organization, we must be open to understanding the change of the emergency physician practice demographic and welcoming this diversification as it occurs. For this reason, I have asked all my fellow Board Members to explore all the areas of healthcare we, as emergency physicians, touch. Our plan is to create work groups or committees in select growing areas to help promote dialogue between our Board and members who practice in these spaces. It is my hope that this also engages our membership to become more active members. This will not always be easy; I understand our members have felt disenfranchised as they entered alternative practice settings. It is up to us to show that regardless of the practice environment, we have one unified voice and encourage all to join and participate.

As we welcome new conversations and opportunities, we will continue to advocate for ED practice and ensure we are at the helm, compensated fairly, given appropriate resources, and not hindered by unnecessary regulations. We represent emergency physicians, not departments. We must protect and advocate for our members as practice settings diversify and we must ensure that goals of our advocacy apply to our members wherever they practice. Our strength is in numbers and we all have a vested interest in protecting the practice of emergency medicine. While this may have once been the role of primary care physicians, now it is dominated by emergency physicians. We know what an appropriate treatment within the constraints around us is and how to run these systems to maximize efficiency and appropriate care. We also appropriately understand the limits of any given resource and when to advance to higher level care areas. Health care systems are seeing value in this. They have learned that placing an emergency physician in this space brings cost-effective efficiency and resource utilization. In addition, patients appreciate receiving care from an emergency physician without having to always travel the distance to an ED, feeling rushed in their care, or paying the co-pays or high deductibles that may come with a hospital visit.

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Dr. Gulati is a practicing emergency physician in San Diego at Emergency Departments and high functioning Urgent Cares. He also practices remotely throughout the state and country in Acute Care Telemedicine.
The major focus of the 2020 General Election centered on the Presidential Election, but there were also important local and statewide elections in California and a slew of initiatives on the ballot. Voter turnout in the general election was 70.8% in California, the highest percentage of eligible voters to participate in a statewide election since 1952 and the third-highest percentage since 1910.

Healthcare, including defending the Affordable Care Act and containing the COVID-19 pandemic, were major points of emphasis during the Presidential Election. At the same time, the College was advocating for financial relief for emergency physicians, not just hospitals, and battling legislation that would ban balance billing without establishing a fair payment standard for emergency physicians.

At the state level, Democrats sought to defend the super majority in the Assembly and State Senate that they had expanded in 2018. Republicans targeted multiple Assembly and State Senate districts that had gone to Democrats in 2018 but had previously been considered Republican strongholds. The makeup of the 2021 -22 State Legislature, after the election stood at 19 Republicans, 60 Democrats, and 31 Democrats in the Assembly and 9 Republicans and 31 Democrats in the State Senate. With the appointment of California Secretary of State to US Senate and several elected officials in consideration for the Biden administration, there will be vacancies that will be filled in special elections in 2021 and these numbers could change slightly. However, the number of seats in the State Legislature held by Democrats continues to be overwhelming and limits the influence of Republicans, giving more influence to “moderate” or “business” Democrats.

As a part of the process in determining which candidates EMPAC should support, your advocacy staff interviewed a wide array of candidates for statewide office and, prior to the COVID-19 shutdown, toured numerous others in emergency departments around the state. There are over 100 races to consider. In order for EMPAC to be most effective, we target those races in which we can have the most impact on the outcome, where there is a stark difference between the candidates, and or where there is a strong champion of our issues seeking re-election. In total, EMPAC contributed to fourteen candidates during the 2020 election cycle. Of those fourteen candidates, thirteen were elected! That’s a success rate of 92.9%.

Building relationships with elected officials early in and throughout their careers is extremely important. While we do not have a crystal
CONGRATULATIONS!

17 California EM Residency Programs Received A Total of $7,025,000 in Funding Through Prop 56!

Alameda Health System-Highland Hospital
Arrowhead Regional Medical Center
Desert Regional Medical Center
Eisenhower Medical Center
Kaiser Permanente Northern California
Kaweah Delta Health Care District
Kern Medical Center
Loma Linda University
Riverside Community Hospital/UC Riverside
Riverside University Health System
St. Joseph's Medical Center - Stockton
St. Agnes Medical Center - Fresno
UHS SoCal MEC
University of California San Diego
UCSF Fresno
UCSF SFGH
LAC+USC

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Telehealth Community Outreach Shows Promise of Virtual POLST Education for SNF Residents: Recruiting to Expand Participation

By Michael McDuffie, PhD; Karl Steinberg, MD; Teressa Vaughn; Christina Marquez; and Bradley Zlotnick, MD, FACEP

The San Diego Coalition for Compassionate Care (SDCCC) is reporting promising findings from an outreach project of video teleconferencing as means to conduct POLST planning conversations with Skilled Nursing Facility (SNF) residents in lockdown during the SARS-CoV-2 (COVID-19) pandemic. In the first phase of the project, the SDCCC, including CalACEP representatives, conducted 12 POLST planning conversations with volunteer SNF residents on Zoom or FaceTime. These conversations yielded new or revised POLST forms in 50% of cases, a significant impact, even across a small sample of conversations. Our group is sharing these early results given the urgent need for effective Advance Care Planning (ACP) in the pandemic, the need for novel approaches to ACP, and the qualitative proof-of-concept provided by these first results. Teleconference platforms allow for effective ACP and POLST education, given well prepared patient educators, access to patient populations, and active interest from SNF leadership, staff, and administration.

Spring through fall of 2020, SDCCC devised and implemented the model process for administration of online POLST consultations, recruited two SNF partners, and completed a small but significant number of test-calls on Zoom or FaceTime. Early results confirm that telehealth visits are feasible and effective interventions to increase POLST completion and revision, especially given active interest and support from SNF leadership. These findings gain significance given that, in September 2020, the California Department of Public Health issued an all-facilities letter (AFL 20-73) recommending explicitly that SNFs develop telehealth programs for ACP.

The outreach initiative includes members of the SDCCC, staff of the Shiley Institute for Palliative Care at CSU San Marcos, faculty at the University of San Diego, and Sharp HealthCare staff. CalACEP members brought the ED perspectives and challenges to this group, in the context of shared interests in promoting palliative care access and education. These groups initiated the San Diego project at the behest of the Coalition for Compassionate Care of California (CCCC). CalACEP has had representation on the CCCC POLST/ACP Physician Leadership Council predating the establishment of POLST in California through the 2008 bill AB 3000.

The SDCCC project model relies on SNF staff to identify residents/families interested in POLST education, assist in scheduling teleconference appointments, and set up the resident with a tablet or smartphone for the meeting. Trained SDCCC POLST educators meet online with the resident and/or family surrogates/agents, review the POLST form, and share information about treatment benefits, risks, burdens, and indications. Residents receive direct educational support as they articulate, review, or revise their wishes for treatment or non-treatment. SNF staff assist with gaining POLST signatures and filing newly completed POLSTs. Ideally, completed POLSTs are also uploaded into an Electronic POLST Registry, like that established by San Diego Health Connect as part of its regional Health Information Exchange network. Teleconference POLST conversations provide educational support for patients who would otherwise go without it, because of locked-down facilities, no-visitor policies, and limited patient access even for clinical support personnel.

To support the project and develop a sustainable volunteer work force of POLST educators, the SDCCC and CSUSIPC at CSUSM launched an ongoing, online POLST Conversation orientation and
training program. Advanced students across health care fields are invited to participate in the project, and once they complete the online orientation session, they are invited to observe and eventually participate in online POLST education conversations. SNF staff are also encouraged to enroll in the webinar session for in-service training (and one RN CEU).

In November 2020, preliminary findings were reported back to the Coalition for Compassionate Care of California. In 2021, the SDCCC plans to continue the project, gather more data, and expand its reach into additional facilities. Further partner sites are needed for the continuation of the project and to develop future research studies. Our group invites contacts from interested SNFs (and similar facilities). For more information, please see the call for participants below, visit the SDCCC website (sandiegoccccare.org), or write to contact@sandiegoccccare.org.

Call for Participation in Telehealth Advance Care Planning Pilot Project

The San Diego Coalition for Compassionate Care (SDCCC) and the Coalition for Compassionate Care of California (CCCC) are piloting a project using telehealth technologies to conduct advance care planning (ACP) conversations during the COVID-19 pandemic. We seek your institution’s participation in this effort. The pandemic compounds the need for ACP, yet social distancing, infection controls, and no-visitor policies make it difficult to support patients who want to file or update Advance Directives or POLST forms. In response, we aim to structure telehealth technologies as a means to bring education and support to patients, clients, and families across a variety of institutional settings, including SNFs, RCFEs, community clinics, housing shelters, correctional facilities, etc.

Video teleconferencing will be used to connect patients/families with a trained ACP consultant from our team. We seek your cooperation and participation to gain (virtual) access to your institution’s patient, client, or resident population, in order to meet with those who might be interested in advance care planning. We also require a small commitment of your staff time to assist in the on-site planning and activities connected to the project:

- Our team will maintain a schedule of ACP consultation appointments and will provide a consultant to meet with each patient, at a set appointment time. The patient’s desired family representative or agent under an advance health care directive may also be included in the teleconference.
- Each facility will designate a staff contact person(s), who will serve as our ground-level contact and on-site partner in the project; our team will provide any needed orientation/training to each staff contact person, prior to any consultations.
- The staff contact person will assist us by
  - sharing online recruiting materials with prospective patients or clients interested in a consultation,
  - setting up appointments using the schedule maintained by our team,
  - connecting the patient with teleconferencing hardware (iPad or equivalent) at the time of the appointment and managing simple technology issues,
  - assisting with the documentation/signature process of new or updated ADs/POLSTs.
- Ideally, the institution will have available iPads or equivalent teleconferencing technology on site, that may be used for consultations. If not, we can try to obtain hardware for use, if your facility is interested in participating, or fall back upon telephone voice calls.
- Our team will provide online recruiting and informational materials to be shared with clients, patients, or residents who might be interested in a consultation.
- Our team will provide all educational materials and decision guides needed by patients or clients in the course of the consultation (available for online viewing).
- We are seeking 10 volunteer residents, clients, or patients per site, over a period of 1-3 months.

Our goal is to provide facilities with a low-cost means for immediate quality improvement. Our team will bring additional expertise and resources to your facility. We hope that you will help us launch our project and expand our capacity to assist with advance care planning. Please contact Michael McDuffie, PhD (mcduffie@csusm.edu); Karl Steinberg, MD (Steinberg.Karl@scrippshealth.org); Teressa Vaughn (teressa.vaughn@sharp.com); or Christina Marquez (christinam@lightbridgemedical.com). Thank you for your time and attention.
Recently, an Air Force pilot presented to our ED after his cabin spontaneously decompressed at ~30,000 feet. He applied his emergency oxygen mask and landed safely, but experienced confusion, nausea, and joint aches. He was diagnosed with decompression illness (DCI) and successfully treated in our hyperbaric chamber, which is typically used for wound treatments and carbon monoxide poisoning here in inland Fresno.

DCI was first recognized in the late 1800’s during the construction of the Brooklyn Bridge in New York and the Eads Bridge, which crosses the Mississippi River in St. Louis.1 These projects were possible thanks to the caisson, a retaining structure invented in 1792 which utilized compressed air to force river water or loose debris out of an area to facilitate construction.1 Workers could excavate underwater sites in a pressurized space to build bridge supports or tunnel framework (see Figure 1).1 Many experienced DCI and some of the terminology is still familiar today: “bends” for joint pain, “chokes” for breathing problems, and “staggers” for neurologic problems.1

Even today pressure differentials are used to prevent flooding or other materials from entering a construction area, and “compressed air workers” (CAW’s) still experience DCI.2 During the 1990’s, construction of a Danish tunnel caused 13 cases of DCI despite following recommended protocols.3 Although CAW’s in the U.S. are regulated by the Occupational Safety and Health Administration (OSHA), the CDC reports that OSHA decompression guidelines are inadequate and continue to leave workers at risk.4

Back to our pilot: flight at high altitude requires protection from low atmospheric pressure; on commercial U.S. flights, the cabin is at a pressure equivalent to 7,000-8,000 feet elevation. In the event that pressurization systems fail, occupants suffer not only hypoxia but also a dramatic decrease in atmospheric pressure, similar to a diver resurfacing quickly. Pressurization issues can occur on commercial flights5 as well as in the military6, as described in our case. Explosive decompression can result in the loss of cabin pressure in less than half a second;6 it is the most common cause of air gas embolism in
the aviation community.5 Smaller cabins are higher risk as they can depressurize more rapidly, while larger cabins have more “buffer.”6 However, even gradual loss of cabin pressure in flight or failure to initiate pressurization during ascent can expose occupants to relatively rapid changes in pressure.5

Even more intriguing are cases of DCI in patients who never left terra firma. Due to the risk of decompression in small aircraft, the military performs simulated decompression indoctrination training to familiarize pilots with the experience. A hyperbaric chamber simulates sudden loss of cabin pressure from 4,000 feet to 15,000 feet. A Canadian case report documented three military trainees who boarded a short commercial flight just 6 hours after uneventfully completing a three-day “depressurization training.”9 During the flight, patient A had musculoskeletal symptoms, patient B had chest pain and shortness of breath, and patient C had both joint and chest symptoms coupled with a 20-minute episode of expressive aphasia and dysphagia. All were given supportive care and recovered after hyperbaric therapy.

DCI can also occur in grounded aircraft. One case report described a malfunctioning environmental control system with a rapid, unanticipated cockpit pressurization while stationary.7 The pilot experienced ear and head pressure, opened the canopy to a loud “bang,” and subsequently had vertigo, tinnitus, right sided facial numbness, blurred vision, and constant substernal chest pain with complete resolution after hyperbaric treatment. Three more similar presentations have been reported in ground maintenance personnel testing aircraft cabin integrity.7

In conclusion, the take home points to your practice are threefold. First, consider DCI in all situations where ambient pressure is altered, not just divers. Practicing in an inland location is not sufficient to eliminate DCI from a differential diagnosis. Second, while noting that DCI has been called a “great imitator,” the classic constellation of joint pain, skin findings, and neurologic complaints are useful to recall when making a diagnostic link across multi-system complaints. Lastly, the treatment for DCI is the same regardless of etiology: supportive care with IV hydration, 100% non-rebreather supplemental oxygen, and rapid transfer to a center capable of hyperbaric treatment. If you are not aware of the nearest center with hyperbaric capabilities, the Divers Alert Network (DAN) is available 24/7 and hyperbaric oxygen therapy treatment centers are also listed in online directories. Kindly remain seated and enjoy treating your next “frequent flyer.”

Dr. Filiberti is the UCSF Fresno Wilderness Medicine Fellow and Dr. Spano is a CalACEP Board Member and the UCSF Fresno Wilderness Medicine Fellowship Director.

REFERENCES:
GUEST ARTICLE

Building A TELEHEALTH PROGRAM in the Emergency Department During COVID-19

By Casey Grover, MD

In March 2020, as COVID-19 rapidly began arriving in the United States, our Emergency Department was working diligently to develop pathways, policies, and procedures to deal with COVID-19. Everyone in our ED was helping to brainstorm; some of our doctors were focusing on airway management, others were focusing on how to avoid exposure at work. However, two of our docs, Dr. Michelle Krueger-Kalinski and Dr. Sameer Bakhda, saw the opportunity to integrate telemedicine into our Emergency Department during COVID-19, and ran with it.

Telemedicine, which is defined as “the remote diagnosis and treatment of patients by means of telecommunications technology,” has an extremely broad set of applications and ways in which it can be used. In our ED, over the last few months, we have created several different ways in which we can use it.

STEP 1

We started in the simplest fashion, using telemedicine as “electronic PPE” (aka ePPE) to reduce the exposure of ED staff to patients with COVID-19 and to slow our burn rate of PPE. This was relatively easy to set up. An iPad was placed next to a patient in her/his room, and the ED provider would connect to the patient from her/his smartphone. This would allow for a video chat that allowed the ED provider to see the patient virtually. We started with this for ED providers that were on shift in the ED for patients in the ED – and if there were any issues with the technology, we could easily just put on PPE and go see the patient in person or talk to the person by phone. We started by using the platform Doxy.me – which allowed free, secure, HIPAA compliant video chat.

STEP 2

As we gained some experience seeing ED patients while on shift with confirmed or suspected COVID-19 patients via telemedicine, Drs. Krueger-Kalinski and Bakhda took us to the next level with telemedicine: having providers at home see patients in the ED via telemedicine. As we learned about the potential for long quarantines for providers exposed to COVID, we realized we needed to allow docs who couldn’t come in to the ED still help move patients in the ED. Using the same platform, we trialed doctors at home logging into our EHR (EPIC), and signing up for patients with confirmed or suspected COVID. The doctor at home would see the ED patient...
via telemedicine, ordering tests as needed, and providing the patient with her/his results and discharge instructions via telemedicine. This, obviously, only works with patients who are not seriously ill. Additionally, this has the potential for managing surges in the ED during COVID-19. If we get 15 check-ins in an hour, it would be easy to have a provider at home log in and function as a provider in triage – in a LEAN just-in-time fashion – to get orders started and patients seen via telemedicine.

**STEP 3**

Our ED experienced the nationwide trend in late March and April of record low numbers of patients checking in to our ED. Patients were afraid to come to the ED, and we were seeing very sad cases of people getting really sick by delaying their presentation to medical care. Drs. Krueger-Kalinski and Bakhda took this on as well, developing an ED telehealth follow-up program for our ED. When patients came to the ED and needed subsequent care – such as a wound check for a cat bite to make sure oral antibiotics were working – we developed a pathway to see the patients in follow-up after their ED visit via telemedicine. We worked with our IT team, our Patient Access (registration), and our ED leadership to create this pathway.

Here’s the basic summary:

- ED provider identifies a patient who needs follow-up during an ED visit
- ED provider offers the patient options for follow-up, including ED telemedicine follow-up
- If the patient chooses ED telemedicine follow-up, the ED provider works with ED practice coordinator to set up a follow-up time for the patient
- Patient is registered by Patient Access on the day of the follow-up visit as a “ED TELEHEALTH” patient that shows up in a separate track board on EPIC
- ED provider, from home, logs in and signs up for the patients. She/he does a verbal consent with the patient, ensuring that the patient gives consent for treatment, consent for treatment via telehealth, and consent to bill insurance
- ED provider completes the telehealth follow-up visit, and writes note in EPIC

We’ve been very successful and innovative with these visits. We bought some pulse oximeters to give to patients, and have been seeing COVID+ patients after their ED visit to check their symptoms and pulse ox levels – making sure they are not deteriorating. We even were able to recheck a pediatric abdominal pain – having the parent palpate the abdomen and having the child jump up and down. When we surveyed our patients about their ED Telehealth follow-up visits – almost all of our visits were 5/5 stars – a huge win in getting patients the follow-up care that they need while providing care that patients like and feel has value.

**LESSONS LEARNED**

Having worked through building these various telemedicine pathways for our ED, we’ve found a few major pitfalls. First, not everyone is “technologically gifted”. In Step 1, with patients and providers both on site in the ED, this allowed us to have other people around to help troubleshoot the technology, and the patient could be seen in person as a backup. If I was working and Dr. Smith was having issues with his Doxy.me account, I was happy to help him get it working. When choosing to expand to Step 2 and 3, it’s important that providers and patients both be comfortable using technology to avoid failed telemedicine visits. Second, for providers working from home – it’s important to ensure that patients feel that the encounter is professional. Seeing patients in your pajamas with your child bugging you the whole time is not going to work. Wear professional attire and find a background for your telemedicine encounter that looks clean and professional. Third, keep the telemedicine encounters simple. We initially tried to set up Bluetooth otoscopes and stethoscopes for a nurse to use to examine the patient – and send information to us electronically, only to find that it was a lot of technical work with little change in patient care. Finally, poor video and/or audio quality makes connecting with patients via telemedicine very difficult. Make sure that both the providers and patients have good access to a strong Wi-Fi signal. You can also try some different platforms for telehealth – our providers have used video chat platforms from Doxy.me and Doximity with good success.

This article was originally published in the September 2020 newsletter of the Independent Emergency Physicians Consortium (IEPC).

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Dr. Grover is a practicing emergency physician at Community Hospital of the Monterey Peninsula in Monterey, CA.
Sports medicine fellowships have been traditionally based in family medicine or orthopaedic surgery residencies. However, in recent years, there have been a small but growing number of sports medicine fellowships dedicated or receptive to Emergency Medicine trained physicians. These fellowships are typically one year in length and provide focused exposure to the entire breadth of sports medicine. Although at first glance, sports medicine is primarily musculoskeletal medicine, in reality it encompasses a huge breadth of material (similar to EM), including cardiology, neurology, infectious disease, administration, dermatology, radiology, and much more. Our expertise as EM trained sports medicine physicians is being increasingly recognized in the sports medicine community. The medical director of the NFL Players Association (Dr. Thom Mayer) and the last two medical directors of the NBA (Drs. Leroy Sims and Jace Provo) are EM trained. Dr. Sims recently spearheaded the massive undertaking of the NBA bubble without a single player testing positive for COVID-19. These EM sports medicine physicians are in some of the highest profile positions in sports medicine.

I am the assistant fellowship director for the Stanford University Non-Operative Sports Medicine fellowship and have one fellowship position that routinely accepts EM applicants. We are one of the few sports medicine programs in the country that work with multiple, D-I, D-II, and high school athletic teams. Through our roles as sports medicine physicians, my fellows and I have traveled to China, Australia, and all across the United States with various teams. If any of this sounds appealing to you, I strongly encourage you to apply for a sports medicine fellowship. The best part of being a team physician? When your team wins a ring, you get one too.
SUBSPECIALTY SPOTLIGHT:
WILDERNESS MEDICINE

Q+A WITH DR. ROBERT KATZER & DR. ADRIANA VAZQUEZ (UCI)
Interviewed By Madeline Mori

WHAT IS WILDERNESS MEDICINE?
Dr. Katzer: I feel the most accurate general definition of wilderness medicine is providing medical care in an austere environment. I also divide it into two general categories. Expedition medicine, which involves pre-planning for and providing medical care to a group when they are out in the wilderness by a member of that group. By contrast, Wilderness EMS involves locating, rescuing, treating medically, and transporting those patients by someone external to the group.

Dr. Vazquez: In my experience it can encompass the practice of medicine in any instance in which not only resources are limited, but there is also difficult access to patients, difficult access to definitive care, challenging environmental conditions, and the need for improvisation as well as creativity.

WHAT WAS YOUR PATH TO WILDERNESS MEDICINE?
Dr. Katzer: I have a long background of enjoying and providing service to parks. This involved volunteering in a national park growing up, hiking, and mountain biking. Once I developed experience in EMS, pairing the two up as part of my medical practice made as much sense as anything else would in life.

Dr. Vazquez: I discovered Wilderness Medicine as a career path much later than I would’ve liked (during second year of residency). I would’ve loved to participate in so many of the programs available for medical students and residents. I was so lucky that with my limited formal experience in Wilderness Medicine I ended up in such an excellent fellowship at UCI.

HOW IS WORKING IN THE FIELD DIFFERENT THAN YOU EXPECTED?
Dr. Katzer: Working in the ED, we have the benefit of so many resources. As a physician, I place an order, or make a verbal request and things seem to happen magically. CT scan. Done. Yankauer. Appears in my right hand. Midazolam drip start here, titrate there. IV pump running. Etc. When working in the field, I am privileged to work with an amazing group of highly skilled professionals. In terms of medical care, however, I manage my packs with the equipment that the conditions allow. At most, there is one other medical provider working with me when delivering that medical care. This is a challenge that I really enjoy.

Dr. Vazquez: The Wilderness Medicine world is so vast, there are so many opportunities being created by folks around the world. It is amazing to see such collaborations.

WHAT HAS WILDERNESS MEDICINE ALLOWED YOU TO LEARN OR DO THAT MIGHT NOT HAVE BEEN POSSIBLE OTHERWISE?
Dr. Vazquez: It has shown me another face of medicine. It’s so much more than being outdoors. For me it’s the place where science meets creativity. It’s all about thinking outside the box and using the environment around you for you. It teaches you how to best optimize resources. It teaches you a lot about priorities; about making conscious and timely decisions and learning to identify your limits as well as the limits of others. It teaches how being prepared and how having a plan saves lives even in the face of chaos. I try to apply those same concepts to my everyday practice that is definitely very far from remote.

WHAT ADVICE DO YOU HAVE FOR ASPIRING WILDERNESS MEDICINE PHYSICIANS?
Dr. Katzer: Find the aspect of wilderness that you love. Match that up with your skills within the house of medicine. If you can combine them as part of your practice I cannot think of a better way to maintain your physician wellness and professional growth.

Dr. Vazquez: Take advantage of all the opportunities available, practice your skills and be sure to share your knowledge responsibly. Knowing what to do in an emergency is so important but so is knowing when and how to apply that knowledge.
As emergency physicians, we are privileged to be in a field that crosses more boundaries than any other medical specialty. It is a calling. Our skills are portable and transferable across cultural and geographic disparities. For these reasons, many of us are drawn to sharing our knowledge and training across the globe — towards treating patients in underserved and austere environments abroad. The rapid growth of international and global health educational initiatives across our U.S. residency training programs is a direct result of those undeniable forces. Additionally, inclusion of such rotations becomes a powerful resident recruitment tool as more and more of our trainees are looking for these opportunities during their formative years.1

However, the survey results reported by Morris et al. in the article “Emergency Medicine Residents Abroad: Current Status and Next Steps” raise some concerns about the initial orientation, mentorship, and preparation practices of our residency programs that offer...
international rotations. While we do have many shining examples of institutions that have “all the pieces in place,” these results highlight the need for increased consistency and support practices across all emergency medicine (EM) training programs in sending our residents on global health missions.

Fortunately there are a number of resources available to guide programs in successfully implementing these types of opportunities. Many of our professional societies, including American College of Emergency Physicians, Emergency Medicine Residents Association, Society for Academic Emergency Medicine, and the American Medical Association, offer comprehensive webpages dedicated to the selection and development of global health rotations for students, residents and fellows. Additionally, many institutional EM residency programs across the country have been offering international rotations for a number of years and have developed extensive websites, protocols, and guidelines based on their experiences. But that is just the start. A number of key components must be present to provide consistency across all programs for the educational benefit and safety of our residents.

First and foremost, there should be a faculty mentor or “champion” in every EM training program for each resident and designated international rotation to coordinate and assist with logistics, planning, and educational goals. These individuals should be uniquely familiar with specific international rotation site(s), having both communicated with key contacts and traveled to the foreign clinics, hospitals, or regions at some point prior to placing residents in those environments. Thus, it is important that department mentors perform an initial site visit to the desired country for a “needs assessment” of the clinical setting(s), educational goals, safety and political stability of the country and region, and support expectations of the hosting entity. This includes identifying an appropriate “supervising physician” onsite if U.S. faculty members will not be traveling directly with trainees (an RRC mandate). The supervising physician is responsible for the educational oversight and post-rotation evaluations of the residents during the entire experience, as well as monitoring their safety and security while staying in the region.

Second, the faculty mentor and their department should establish a “Memorandum of Understanding” (MOU) with the host institution prior to the start of global health rotations. The MOU should clearly specify the roles and responsibilities of the trainees, including duty hours and off-service times. The MOU must also address the insurance coverage and limits of liability for the residents. As suggested by the previous article, up to one third of residents may be sent to locations without specified liability coverage… a very concerning statistic that should not be overlooked. Responsibility for any financial support (travel, food, housing, etc.) should also be clearly outlined in the MOU.

Third, intermittent site visits abroad should be performed by departments and/or mentors on a regular basis (i.e. every 1-2 years) to each of their global health venues. This insures consistency of educational benefits and adherence to Accreditation Council for Graduate Medical Education Core Competencies for resident participants and monitors any potential risks that can arise over time with foreign assignments.

Finally, as suggested in the previous article, establishing a formalized pre-departure training program for residents is crucial. This curriculum could be incorporated into annual residency didactics, provided as additional training sessions, or in conjunction with Global Health Fellowship programs. Understanding culture disparities, travel safety, and regional disease prevalence and patterns are essential preparations for our residents traveling internationally.

The popularity and growth of international experiences is inevitable in our specialty. This is evidenced by the expansion of EM residency rotations and Global Health Fellowship programs. It is in our nature to share our emergency medicine expertise, practice in new environments, and experience foreign cultures. However, based on the results of this article, we have more work to do towards safely sending our residents abroad.

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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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REDUCING EMERGENCY DEPARTMENT TRANSFERS
FROM SKILLED NURSING FACILITIES THROUGH AN EMERGENCY PHYSICIAN TELEMEDICINE SERVICE
INTRODUCTION: Transfers of skilled nursing facility (SNF) residents to emergency departments (ED) are linked to morbidity, mortality and significant cost, especially when transfers result in hospital admissions. This study investigated an alternative approach for emergency care delivery comprised of SNF-based telemedicine services provided by emergency physicians (EP). We compared this on-site emergency care option to traditional ED-based care, evaluating hospital admission rates following care by an EP.

METHODS: We conducted a retrospective, observational study of SNF residents who underwent emergency evaluation between January 1, 2017–January 1, 2018. The intervention group was comprised of residents at six urban SNFs in the Northeastern United States, who received an on-demand telemedicine service provided by an EP. The comparison group consisted of residents of SNFs that did not offer on-demand services and were transferred via ambulance to the ED. Using electronic health record data from both the telemedicine and ambulance transfers, our primary outcome was the odds ratio (OR) of a hospital admission. We also conducted a subanalysis examining the same OR for the three most common chronic disease-related presentations found among the telemedicine study population.

RESULTS: A total of 4,606 patients were evaluated in both the SNF-based intervention and ED-based comparison groups (n=2,311 for SNF based group and 2,295 controls). Patients who received the SNF-based acute care were less likely to be admitted to the hospital compared to patients who were transferred to the ED in our primary and subgroup analyses. Overall, only 27% of the intervention group was transported to the ED for additional care and presumed admission, whereas 71% of the comparison group was admitted (OR for admission = 0.15 [9% confidence interval, 0.13-0.17]). Conclusion: The use of an EP-staffed telemedicine service provided to SNF residents was associated with a significantly lower rate of hospital admissions compared to the usual ED-based care for a similarly aged population of SNF residents. Providing SNF-based care by EPs could decrease costs associated with hospital-based care and risks associated with hospitalization, including cognitive and functional decline, nosocomial infections, and falls. [West J Emerg Med. 2020;21(6)205-209.]

INTRODUCTION

Transfers from skilled nursing facilities (SNF) to the emergency department (ED) account for approximately 14 million ED visits annually, a fifth of which may be avoidable.1 In many cases, ED visits lead to admission, which in turn conveys risks of cognitive and functional decline, nosocomial infections, and falls.2,3 Furthermore, for the frailer subgroup of SNF residents transferred to the ED, up to 78% of their resulting hospitalizations are potentially avoidable.4 Several solutions have been proposed to reduce admissions for these patients. One is to improve the quality of ED care for seniors and SNF residents through the development of geriatric-focused emergency care, and improved communication between SNFs and EDs.5 Incentive programs have also been established to improve longitudinal management of chronic medical conditions by SNFs, reducing transfers for patients with congestive heart failure (CHF) and diabetes mellitus (DM).6,7

Few studies have targeted the scenario that often triggers a transfer: when the SNF resident has an acute medical condition such as a fall, a fever, or an exacerbation of a chronic disease. Many SNFs retain on-call medical staff, but most lack the infrastructure to manage acute unscheduled care, particularly after-hours, and SNF healthcare teams often have little recourse other than to call 911 when patients need evaluation.8-10 One potential intervention to address this scenario is enlisting a physician via telemedicine to evaluate patients with acute care needs at the SNF. Telemedicine consults have been successfully used within EDs for a variety of subspecialties; providing rapid evaluations within the SNF setting could obviate transfers for minor injuries. Prompt evaluations could enable earlier interventions in acute infections and chronic disease exacerbations, potentially preventing the need for ED transfers or facilitating earlier transfers when warranted.

Objectives

Our primary objective was to determine whether a SNF-based telemedicine consultation service staffed by emergency physicians (EP) could reduce hospital admissions of patients requiring acute evaluation, compared to patients who were taken directly to an ED. Our secondary objectives were to compare care escalation for conditions most amenable to on-site acute care in the SNF, and to broadly examine the financial implications of onsite acute care.

METHODS

Study Setting and Design

This was a retrospective, observational study of SNF residents between January 1, 2017–January 1, 2018. The intervention group comprised residents of six urban SNF facilities in the Northeastern United States, who underwent an acute telemedicine evaluation.11 The telemedicine service consists of an on-demand consultation by an EP, facilitated by a clinical care specialist (CCS) who is a paramedic or emergency medical technician on-site at all times. The service is used for acute evaluations when facility staff judged that patients would otherwise require ED transfer. The CCS uses a cart with point-of-care labs, electrocardiograms, telemetry, and ultrasound (Figure 1). Patients can also be directly transported for outpatient imaging (eg, chest radiograph and computed tomography). Order sets and pathways are used to streamline decisions to treat in place or transfer. The CCS
in the general Medicare population only about 30% of those treated in the ED are admitted as inpatients.12 The use of a full calendar-year period was intended to avoid the potential confounding effects of seasonality. The two populations were tested for demographic concordance in terms of age using an independent t-test and gender using a Fisher’s exact test, and a logistic regression was conducted with both features relative to the outcome to examine whether they played a role as confounders.

Patients in the control group were evaluated in the ED and designated as either admitted or discharged. Patients were considered discharged from the ED if they did not have an inpatient admission, or if they were discharged to their original facility, discharged to acute rehab, or discharged after observation care in the ED. For our primary outcome, we report the odds ratio (OR) of admission with 95% confidence interval (CI). As a significant potential benefit of telemedical care for SNFs is early intervention in chronic disease exacerbations, we conducted a subanalysis examining the OR of admission across the three most common chronic disease-related presentations found among the study population, with strict Bonferroni correction for multiple comparisons.

**RESULTS**

A total of 2311 patients were evaluated in the SNF-based group, matched with 2295 patients in the control group. The groups had similar distributions by gender (intervention group: 60.2% female; control group 58.1% female; p = 0.14), but the control group was slightly older (intervention group: 75.6 [standard deviation (SD) 12.3]; control group 78.9 [SD 8.14]; p<0.001). A logistic regression demonstrated no significant association between these factors and admission. The most common reasons for telemedicine activation were exacerbations of CHF, chronic obstructive pulmonary disease (COPD), and DM (Table 1). The mean cost of the telemedicine care delivery in this study was $816 per episode.

Patients who received SNF-based acute care were less likely to have their care escalated. Only 27% of the SNF-based group were transferred to the ED, whereas 71% of the control group were admitted to the hospital from the ED (OR = 0.15 (95% CI 0.13-0.17), p < 0.001, Table 1). These results were directionally consistent across the top three conditions, although rates of presentation for all three were significantly higher in the SNF-based group (Table 1).

**DISCUSSION**

Telemedicine has been heralded as a panacea to many systemic problems in healthcare; although widespread adoption continues its proven benefits are more modest. Many studies examining telemedicine across settings have failed to find compelling clinical or cost benefits14,15 although patients are often satisfied with these services and remain optimistic about their potential.16,17 The most successful applications of telemedicine have been sub specialty

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**Figure 1.** Clinical care specialist telemedicine cart in a skilled nursing care facility.

monitors SNF residents in accordance with EP orders and can re-initiate consultations. If the patient cannot be definitively managed on-site, or if the patient or family prefers transfer, the EP directs staff to carry out immediate treatments and expedite transport.

The control group consisted of residents of SNFs that did not offer telemedicine evaluations. These residents were transferred via ambulance to the ED of an urban tertiary care hospital with 55,000 visits annually. Patients were broadly matched on age and gender. The study was approved by the institutional review board of the tertiary care hospital.

**Protocol**

We used electronic health record (EHR) data from the telemedicine service and the tertiary care hospital to abstract age, gender, chief complaint, and disposition. Data were de-identified in accordance with the Health Insurance Portability and Accountability Act-Safe Harbor criteria.

**Analysis**

Our primary outcome was whether a patient was ultimately admitted to the hospital. For the intervention group, EHR data beyond the telemedicine visit was not available; hence, we could not definitively determine whether the patient was admitted after ED transfer. To address this limitation, we conservatively designated any patient in the intervention group who was transferred to the ED as admitted. This should underestimate the potential benefit of the intervention, as
Table 1. Care escalation processes for different conditions in telemedicine and control group.

<table>
<thead>
<tr>
<th>Medical complaint and care escalation</th>
<th>Telemedicine group</th>
<th>Control group</th>
<th>OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All conditions, n</td>
<td>2,311</td>
<td>2,295</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care escalation, n (%)</td>
<td>623 (27)*</td>
<td>1,629 (71)†</td>
<td>OR 0.15 (0.13-0.17)§</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>CHF, n (% all visits)</td>
<td>576 (25)</td>
<td>314 (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care escalation, n (%)</td>
<td>156 (26)*</td>
<td>257 (82)†</td>
<td>OR 0.08 (0.06-0.11)§</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>COPD, n (% all visits)</td>
<td>607 (26)</td>
<td>363 (16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care escalation, n (%)</td>
<td>158 (26)*</td>
<td>265 (73)†</td>
<td>OR 0.13 (0.10-0.18)§</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>DM, n (% all visits)</td>
<td>761 (33)</td>
<td>234 (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care escalation, n (%)</td>
<td>213 (28)*</td>
<td>152 (65)†</td>
<td>OR 0.21 (0.15-0.29)§</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

* Denotes transfer to the emergency department (ED)
† Denotes admission to the hospital.
§ For the purposes of this analysis it was assumed all telemedicine patients transferred to the ED were admitted; lower odds ratio indicating lower odds of admission in the telemedicine group.

OR, odds ratio; CI, confidence interval; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus.

consultations in resourcelimited settings. In the ED, this includes tele-neurology for acute stroke, remote radiology, and psychiatric evaluations. Telemedicine has also shown promise within SNFs for chronic disease management and related hospitalizations.

A pilot study by Dy et al demonstrated that a telemedicine team of an endocrinologist, nurse, and dietician improved glycemic control for SNF residents. Grabowski et al demonstrated a trend toward reducing unnecessary transfers by replacing SNFs’ on-call physicians with telemedicine, but had limited utilization of their service. More recently, Gillespie et al showed telemedicine reduced ED utilization for patients with dementia in senior living communities.

The intervention evaluated in our study lies at the intersection of these trends, providing an EP as a specialty consultant. The potential to decrease ED transfer and hospital admission is facilitated by the CCS and expanded diagnostic tools, allowing the EP to conduct much of an ED workup in situ. Furthermore, the ability of the CCS to fulfill medication orders and re-initiate consultation effectively allows for observation care at the SNF.

While rigorous cost-effectiveness studies of telemedicine are lacking, the complexity of the interventions in this study invariably comes at increased cost. The average cost of the telemedicine service in this study was $816 per episode, compared to the flat rate of $30,000 per facility per year charged by Grabowski et al. Amortized across 2311 consultations in six SNFs over a one-year period, this represents a more than tenfold increase. Conversely, the average Medicare payment for a SNF-based rehospitalization is over $10,000. Considering the added expenses of ambulance transportation and EP fees, this enhanced telemedicine service would be cost-effective if it averted 10% of hospitalizations. The data from this program suggests an 80% reduction in care escalation, suggesting this is a worthwhile investment, irrespective of the clinical benefits from avoiding unnecessary admissions.

LIMITATIONS

This study has several significant limitations. It is possible that the telemedicine program was activated for conditions where the staff would not automatically initiate transport to the ED, and SNFs may have substantial differences in their threshold for transferring patients; however, a similar reduction was seen in patients with COPD and CHF exacerbations, conditions where ED transfer is typically required. The lack of follow-up information for the intervention group obscures patients’ disposition after ED transfer, which we addressed by conservatively assuming these patients were admitted when many may have been observed or discharged directly. Seasonality is also a potential confounding factor, as during flu season facilities without the capacity to test or cohort patients may be more inclined to transfer patients. Finally, as a pilot study our analysis does not include specific markers of disease severity, such as oxygen saturation during COPD and CHF exacerbations, which could substantially affect the effects of the intervention. More robust matching of the groups (eg, propensity-score matching on age and comorbid conditions) would improve the generalizability of our results.

CONCLUSION

In this pilot study, emergency physician-staffed telemedicine acute evaluations of SNF residents were associated with lower rates of hospital admissions than typical ED care, including in exacerbations of chronic diseases such as COPD and CHF, which represented a substantial portion of overall evaluations in the intervention group. The COVID-19 pandemic has broadly increased the tempo and urgency of telemedicine use; however, more in-depth studies are needed to determine whether these interventions result in longer-term reductions in chronic disease exacerbations and hospitalization rates among SNF residents. While comprehensive cost data for admitted
patients was not available in this study, the reduced likelihood of hospital transport and admission for SNF residents may justify the increased upfront costs of a comprehensive telemedicine evaluation.

ACKNOWLEDGMENTS

The authors thank Leon Sanchez, MD MPH, Jonathan Fisher, MD, and Tim Peck, MD, for their suggestions and assistance with data collection.

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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. No author has professional or financial relationships with any companies that are relevant to this study. This work was supported by a grant from the Gary and Mary West Health Institute.

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A Roadmap for the Student Pursuing a Career in Pediatric Emergency Medicine

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Section Editor: Mark I. Langdorf, MD, MHPE
Submission history: Submitted July 14, 2019; Revision received October 7, 2019; Accepted October 7, 2019
Electronically published December 9, 2019
Full text available through open access at http://escholarship.org/uc/uciem_westjem
DOI: 10.5811/westjem.2019.10.44466

24 | LIFELINE a forum for emergency physicians in california
INTRODUCTION: Three pathways are available to students considering a pediatric emergency medicine (PEM) career: pediatric residency followed by PEM fellowship (Peds-PEM); emergency medicine residency followed by PEM fellowship (EM-PEM); and combined EM and pediatrics residency (EM&Peds). Questions regarding differences between the training pathways are common among medical students. We present a comparative analysis of training pathways highlighting major curricular differences to aid in students’ understanding of these training options.

METHODS: All currently credentialed training programs for each pathway with curricula published on their websites were included. We analyzed dedicated educational units (EU) core to all three pathways: emergency department (ED), pediatric-only ED, critical care, and research. Minimum requirements for primary residencies were assumed for fellowship trainees.

RESULTS: Of the 75 Peds-PEM, 34 EM-PEM, and 4 EM&Peds programs screened, 85% of Peds-PEM and EM-PEM and all EM&Peds program curricula were available for analysis. Average Peds-PEM EUs were 20.4 EM, 20.1 pediatric-only EM, 5.8 critical care, and 9.0 research. Average EM-PEM EUs were 33.2 EM, 18.3 pediatric-only EM, 6.5 critical care, and 3.3 research. Average EM&Peds EUs were 26.1 EM, 8.0 pediatric-only EM, 10.0 critical care, and 0.3 research.

CONCLUSION: All three pathways exceed pediatric-focused training required for EM or pediatric residency. Peds-PEM has the most research EUs, EM-PEM the most EM EUs, and EM&Peds the most critical care EUs. All prepare graduates for a pediatric emergency medicine career. Understanding the difference in emphasis between pathways can inform students to select the best pathway for their own careers. [West J Emerg Med. 2020;21(1):12-17.]

EDUCATIONAL RESEARCH CAPSULE SUMMARY

What do we already know about this issue?
There are three pathways toward a career in pediatric emergency medicine (EM), each with its own strengths and limitations.

What was the research question?
What are the differences between pediatric EM training pathways that students pursuing this career should understand?

What was the major finding of the study?
The curriculum of each pathway with their noted strengths can be used to guide students toward their ultimate desired careers.

How does this improve population health?
Students can identify their career path early in their training toward future careers focused on the care of children in the emergency setting.

that lead to a variation in clinical practice. Given the five-to-six-year training commitment, it is crucial that medical students considering a career in pediatric EM understand the nuances of each pathway prior to the National Resident Matching Program submission deadlines. We present a curriculum analysis that aims to elucidate the different clinical trajectories of each pathway and aid in appropriate selection for the individual student’s career goals.
**METHODS**

We obtained a list of currently credentialed Peds-PEM, EM-PEM, and EM&Peds programs from the ACGME website in January 2018. Each program’s curriculum was obtained from its official website. Programs with insufficient curriculum or no curriculum posted on their websites were excluded. We analyzed dedicated educational units (EU) regarding time spent in the emergency department (ED) (adult or not specified between adult & pediatric), pediatric-only ED, critical care (including adult medical, trauma, pediatric, and neonatal), and research. These were chosen as they are the most common for comparison purposes and make up the majority of EUs in each of the three pathways. The ACGME considers 12-month/year and 13-block/year EUs to be equivalent. EUs split between two experiences were assigned 0.5 EU to each area. Results were averaged for each of the three training pathways.

Peds-PEM and EM-PEM graduates were assumed to have fulfilled the minimum ACGME-required EUs during their primary residency and these were added to each fellowship’s totals prior to averaging. These include three EU pediatric-only ED and four EU critical care required to complete a pediatric residency, and five EU pediatric ED and four EU critical care required to complete an EM residency. Dedicated EUs spent in the ED for primary EM residents were assumed to be 21.8 based on the mean number for three-year EM residencies published in 2015 by Stowell et al.² We used Google Sheets (Google, Mountain View, CA) to tabulate and average the totals.

**RESULTS**

We identified a total of 113 active programs from the ACGME website (75 Peds-PEM; 34 EM-PEM; 4 EM&Peds). Of these, 64 Peds-PEM (85%) programs, 29 EM-PEM (85%), and 4 Peds-EM (100%) had published curricula on their official websites and were included. Results are tabulated in Table 2.

The EM-PEM training track demonstrated the most overall dedicated ED EUs (35.4) followed by EM&Peds (26.1) and Peds-PEM (20.4). Peds-PEM graduates have the most dedicated pediatric-only ED EUs (20.1) followed by EM-PEM (18.3) and EM&Peds (8.0). EM&Peds graduates have the most dedicated critical care EUs (10) followed by EM-PEM (6.5) and Peds-PEM (5.8). Peds-PEM graduates have the most dedicated research EUs (9.0) followed by EM&Peds (3.3), and EM&Peds (0.3).

**DISCUSSION**

As all three pathways offer pediatric emergency training beyond what the primary residencies of EM or pediatrics offer, it is the route taken that will most affect the ultimate career options. The overlapping strengths of each provide an environment for the graduates of each training pathway to gain sufficient experience in both acute and critical care of the pediatric patient. The strengths and potential limitations of each pathway are highlighted in Table 3.
Pediatrics-Pediatric Emergency Medicine Pathway

The Peds-PEM pathway offers the most overall training in pediatrics with a foundation of ambulatory and inpatient care in the primary residency followed by specialty training in pediatric emergency care during the fellowship. This requires both a residency and a fellowship match. The Peds-PEM route aims to train pediatricians first and then focus them into pediatric emergency physicians through a large amount of time spent in the pediatric ED with a targeted exposure to adult EM as required by the ACGME. There is a heavy focus on dedicated research time compared to the other pathways. Peds-PEM graduates are eligible for the PEM sub-boards co-sponsored by ABEM and ABP. The clinical scope of Peds-PEM is limited to patients <21 years of age, making children’s hospitals or EDs with a high pediatric volume the ideal career for these graduates. However, these age limits are noted to be arbitrary and 21 years is not a firm limit. Still, much of adult EM will be outside the scope of training and hospital privileges afforded to Peds-PEM graduates. Peds-PEM duration of training is six years without variation as described by the ACGME program requirements for PEM fellowships.

Emergency Medicine-Pediatric Emergency Medicine Pathway

The EM-PEM pathway offers the most overall training in EM with a foundation of emergency and critical care in the primary residency followed by specialty training in pediatric emergency care during the fellowship. This requires both a residency and a fellowship match. The EM-PEM route aims to train emergency physicians first and then to focus them into pediatric emergency physicians through dedicated pediatric ED time and some subspecialty pediatrics. EM-PEM graduates are eligible for the PEM sub-boards co-sponsored by the ABP and the ABEM. The clinical scope of EM-PEM is all ages, although they are limited to an ED practice setting without the potential for pediatric ambulatory or inpatient medicine. EM-PEM duration of training is between five and six years. This is variable as students may choose to pursue a three- or four-year EM primary residency prior to their two-year fellowship.

Table 2. Results of average educational units (EU) in each pathway according to published curricula.

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Peds-PEM (n=64)</th>
<th>EM-PEM (n=29)</th>
<th>EM&amp;Peds (n=4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ED</td>
<td>20.4 (17 – 34)</td>
<td>35.4 (32.8 – 40.8)</td>
<td>26.1 (23.5 – 31.5)</td>
</tr>
<tr>
<td>Pediatric-only ED</td>
<td>20.1 (16 – 31)</td>
<td>18.3 (14 – 22)</td>
<td>8.0 (6 – 10)</td>
</tr>
<tr>
<td>Critical care</td>
<td>5.8 (4 – 8)</td>
<td>6.5 (4 – 9)</td>
<td>10.0 (8 – 12)</td>
</tr>
<tr>
<td>Research</td>
<td>9.0 (1 – 15)</td>
<td>3.3 (1 – 8)</td>
<td>0.3 (0 – 1)</td>
</tr>
</tbody>
</table>

Peds-PEM, pediatrics-pediatric emergency medicine fellowship; EM-PEM, emergency medicine-pediatric emergency medicine; EM&Peds, combined emergency medicine and pediatrics residency; ED, emergency department.

Table 3. Strengths and potential limitations of training pathways in pediatric emergency medicine.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Peds-PEM</th>
<th>EM-PEM</th>
<th>EM&amp;Peds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of training</td>
<td>6 years</td>
<td>5-6 years</td>
<td>5 years</td>
</tr>
<tr>
<td>Training methodology</td>
<td>General pediatric residency with PEM fellowship</td>
<td>EM residency with PEM fellowship</td>
<td>Simultaneous EM and general pediatric residency</td>
</tr>
<tr>
<td>NRMP cycles</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Training focus by curriculum</td>
<td>Research pediatric ED</td>
<td>General ED</td>
<td>General pediatrics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pediatric ED</td>
<td>General ED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Critical care</td>
</tr>
<tr>
<td>Primary board eligibility</td>
<td>General pediatrics</td>
<td>Emergency medicine</td>
<td>General pediatrics and emergency medicine</td>
</tr>
<tr>
<td>PEM Sub-board eligible?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Can care for adults?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ambulatory or hospitalist potential?</td>
<td>Both</td>
<td>Neither</td>
<td>Both</td>
</tr>
</tbody>
</table>

EM, emergency medicine; PEM, pediatric emergency medicine; Peds-PEM, pediatrics-pediatric emergency medicine fellowship; EM-PEM, emergency medicine-pediatric emergency medicine; EM&Peds, combined emergency medicine and pediatrics residency; NRMP, National Residency Match Program.
Emergency Medicine and Pediatrics Pathway

The EM&Peds pathway offers the broadest training of all pathways with complete training in both general pediatrics and emergency medicine. This requires only a residency match. The EM&Peds route aims to simultaneously train emergency physicians and general pediatricians, resulting in pediatric emergency physicians. Although this pathway has the least amount of pediatric-only ED EUs, the philosophy is to learn procedural skills and acute care principles through EM residency training and complete care of the pediatric patient through ambulatory and inpatient pediatric rotations. The result is not only an exposure to all aspects of pediatric and EM care but also a heavier focus on critical care compared to the other pathways.

EM&Peds graduates are eligible for dual board certification in both EM and general pediatrics but have not been eligible for the PEM sub-board certification since 1998. Some centers, predominately freestanding children's hospitals that care only for children, consider PEM sub-board certification a prerequisite which may be a limitation for EM&Peds graduates. However, the versatility of EM&Peds training may be a strength to centers that care for both adults and children. Many EM&Peds graduates work in academic, community, or rural centers. EM&Peds graduates are trained to care for children in ED, ambulatory and inpatient settings. EM&Peds training duration is five years as set by the joint ABP and ABEM agreement.

Nuances Between Pathways

The EM&Peds physician and the Peds-PEM physician both share the primary pediatric board, allowing eligibility for additional ABP-sponsored fellowship training or shared time as a clinical pediatrician or pediatric hospitalist in addition to their EM practice. Similarly, the EM&Peds physicians and EM-PEM physician share the primary EM board allowing for EM fellowship training potential. Certainly, all of the pathways in pediatric EM provide a background for such physicians to take positions of advocacy and leadership in clinical and academic settings.

There are notable differences in the number of physicians trained through each pathway. A 2006 pediatric study referencing the Future of Pediatric Education II data revealed that at the time there were approximately 1300 ABP-certified Peds-PEM practitioners compared to only 170 ABEM-certified EM-PEM practitioners, a proportion that has likely continued to shift to less representation by EM-PEM physicians. In 2007, Murray et al. also showed through a survey of PEM fellowship programs that only 5% of entering fellows had an EM primary board background. More recently, 2018 ABEM data reveals that in 2017, only 40 ABEM-eligible EM-PEM physicians were enrolled in PEM fellowship programs, suggesting that only ~ 20 EM residency graduates enter PEM fellowships annually.

The reasons for this are not clear, although recently the ABEM EM to PEM taskforce has sought to address this difference. One possibility is that EM graduates do not seek to be further specialized as acute care of children is already within their scope of practice. Centralization of pediatric emergency care may also lead to fewer opportunities for EM&Peds graduates in community EDs, where PEM fellowship training would not necessarily be more advantageous than general EM training alone. During our research we noted that there were less EM-based PEM fellowships (29) compared to pediatrics-based PEM fellowships (64). Notably, several pediatrics-based programs that published a Peds-PEM curriculum did not publish an EM-PEM curriculum.

Although possibly due to omission from their websites, PEM fellowship programs are not required to accept both pediatrics and EM candidates. This may indicate fewer available fellowship opportunities for the EM-PEM pathway compared to Peds-PEM or that EM-PEM trainees are required to complete three years at that fellowship instead of two. Lastly, financial differences may contribute to this issue. PEM-fellowship trained physicians traditionally have a lower salary than general emergency physicians. However, EM&Peds graduates do report making similar salaries to that of their general EM colleagues. We speculate that EM-PEM graduates likely make similar salaries to EM and EM&Peds graduates given their capacity to care for adults. We also speculate that salary is more likely related to the practice setting than the training itself, although the training does in part help determine the practice setting.

There were 48 postgraduate year 1-5 candidates enrolled in EM&Peds programs in the ABEM dataset, making it the second most common pathway chosen. Still the vast majority of pediatric emergency providers are Peds-PEM, making the EM&Peds pathway less well known by comparison. More research might reveal more subtle differences between the specifics of these training pathways as regards specific procedural experience, patient volume, or other metrics.

Choosing a Pathway

What may be considered a limitation to one student may be a strength to another. An appropriate starting point may be whether the student wishes to care for adults or only children. Should students not wish to care for adults, a Peds-PEM pathway would be most suitable. If students would like to care for adults, the applicant would be directed toward either EM-PEM or EM&Peds. The difference here is eligibility for the PEM sub-boards and general pediatrics exposure for the EM&Peds graduate. EM-PEM graduates are eligible for subspecialty certification, which may increase the likelihood for employment in some children’s hospitals or other centers that require subspecialty certification. EM&Peds graduates are no longer eligible for sub-board certification, which can be a deterrent to certain centers. However, EM&Peds graduates have a much broader scope of practice with the potential for more varied career paths including ambulatory and hospital pediatrics to which EM-PEM graduates do not have access. This may be attractive to centers looking to employ a provider in several clinical areas or departments. Students can certainly blaze their own trail within a given pathway but should be aware and well prepared for the path ahead of them.

LIMITATIONS

Data collected is limited to only those programs with a published online curriculum. By not polling programs directly, this does give an incomplete picture and may have failed to recognize more recent
developments in certain programs. However, the authors felt that this approach was similar to that of a medical student researching future career options and was thus appropriately realistic with a relatively large sample size. Confirmation and clarification from programs would increase the overall accuracy of the available data by ensuring only the most recent/updated curriculum was used, and would add more data points by including programs without a publicly published curriculum.

Longitudinal experience was not accounted for in the dataset as only dedicated EUs were included. Similarly, many training programs also incorporate clinical shifts into elective or research time. However, dedicated EUs are what is mandated by the ACGME as well as by the ABP and ABEM for board certification and thus are a better marker of the overall goals of training programs. The exact number of dedicated EUs that Peds-PEM and EM-PEM residents do during residency was estimated. However, all graduates from accredited pediatrics or EM primary residencies are eligible for the PEM fellowship, thus making the minimum number required a reasonable estimation. To our knowledge, a central resource with this depth of analysis and information was not previously available to medical students considering their career choices.

CONCLUSION

Three training pathways lead to expertise in pediatric emergency medicine although with different career trajectories. Peds-PEM training is ideal for the student who does not wish to care for adults, although clinical career options may be limited to children’s hospitals or EDs with a high enough pediatric volume to sustain the narrower scope of practice. EM-PEM and EM&Peds pathways are similar, although the lack of subboard eligibility for EM&Peds may be a limitation for clinical careers in centers that require the sub-board certification. The curriculum of each pathway can be used to guide students toward their ultimate desired career. Understanding the characteristics of current available paths will hopefully set students up for success in future careers focused on the care of children in the emergency setting.

Address for Correspondence: Aaron N. Leetch, MD, The University of Arizona College of Medicine, Department of Emergency Medicine, PO Box 245057, Tucson, AZ 85724. Email: aleetch@aemrc.arizona.edu.

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. No author has professional or financial relationships with any companies that are relevant to this study. There are no conflicts of interest or sources of funding to declare.

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REFERENCES

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Happy New Year!

Cheers from the California ACEP Board and Staff.
David Kim, MD was promoted to Assistant Professor at Stanford Emergency Medicine.

Holly Caretta-Weyer, MD is the new Associate Fellowship Director for the Medical Education Scholarship Fellowship at Stanford Emergency Medicine.

Luz Silverio, MD is Stanford Emergency Medicine's new Assistant Program Director for their Residency Program.


Peter Acker, MD, MPH, FACEP was promoted to Clinical Associate Professor at Stanford Emergency Medicine.

Nathan Kuppermann, MD, FACEP was awarded Best Research Presentation from the American Academy of Pediatrics National Conference & Exhibition for his presentation on emergency medicine for validation of a prediction rule for serious bacterial infections in febrile infants under 60 days in a multicenter network.

Dennis Hsieh, MD is the new Chair of Social Emergency Medicine at American College of Emergency Physicians.

Dr. Jenn Fang fellowship matched in Informatics at Ronald Reagan Olive View UCLA.

Dr. Kelsey Wilhelm fellowship matched in EMS fellowship at Harbor UCLA.

Dr. Grant Nelson received the 2020 Teaching Faculty of the Year Award from Desert Regional.

Dr. Daniel Udrea fellowship matched in Critical Care at Loma Linda.

Dr. Andrew Pachon fellowship matched in EMS at LAC+USC.

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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 2019-20 contributors (in alphabetical order):

- Antelope Valley Emergency Medical Associates
- Culver Emergency Medical Group
- Emergent Medical Associates
- Mills Peninsula Emergency Medical Associates
- Napa Valley Emergency Medical Group
- Pacific Emergency Providers, APC
- Riverside EP
- Temecula Valley Emergency Physicians
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Looking for a way to share your emergency medicine experience? Want to share a story from your last shift? Or maybe career or life advice? We are looking for member and guest articles, including letters-to-the-editor. Please note that all articles and letters are reviewed and may be edited for grammar and content.

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- Summer – Leadership Development (mentorship strategies, C suite, group leadership, etc.)

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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.

### JANUARY 2021

<table>
<thead>
<tr>
<th>Date</th>
<th>Meeting</th>
<th>Type</th>
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<tbody>
<tr>
<td>12th at 9am</td>
<td>Reimbursement Committee</td>
<td>Conference Call</td>
</tr>
<tr>
<td>14th at 10am</td>
<td>Government Affairs Committee (GAC)</td>
<td>Conference Call</td>
</tr>
<tr>
<td>20th at 9am</td>
<td>Executive Committee</td>
<td>Conference Call</td>
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### FEBRUARY 2021

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<thead>
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<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>1st</td>
<td>Board of Directors Nominations Open</td>
<td>Online</td>
</tr>
<tr>
<td>4th at 10am</td>
<td>Board of Directors Meeting</td>
<td>Virtual</td>
</tr>
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<td>17th at 1pm</td>
<td>Executive Committee</td>
<td>Conference Call</td>
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### MARCH 2021

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<th>Date</th>
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<tbody>
<tr>
<td>11th at 10am</td>
<td>Government Affairs Subcommittee #1</td>
<td>Conference Call</td>
</tr>
<tr>
<td>11th at 12pm</td>
<td>Government Affairs Subcommittee #2</td>
<td>Conference Call</td>
</tr>
<tr>
<td>11th at 2pm</td>
<td>Government Affairs Subcommittee #3</td>
<td>Conference Call</td>
</tr>
<tr>
<td>15th</td>
<td>Board of Directors Nominations Close</td>
<td>Online</td>
</tr>
<tr>
<td>18th at 10am</td>
<td>Government Affairs Committee (GAC)</td>
<td>Conference Call</td>
</tr>
<tr>
<td>31st</td>
<td>Board Candidate Forms Due</td>
<td>Online</td>
</tr>
<tr>
<td>31st at 9am</td>
<td>Executive Committee</td>
<td>Conference Call</td>
</tr>
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### APRIL 2021

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>1st</td>
<td>Councilor Interest Form Opens</td>
<td>Online</td>
</tr>
<tr>
<td>13th at 9am</td>
<td>Legislative Leadership Conference (LLC)</td>
<td>Virtual</td>
</tr>
<tr>
<td>14th at 9pm</td>
<td>Board of Directors Meeting</td>
<td>Virtual</td>
</tr>
<tr>
<td>25th – 29th</td>
<td>ACEP Leadership and Advocacy Conference</td>
<td>Washington, DC</td>
</tr>
<tr>
<td>29th at 1pm</td>
<td>Executive Committee</td>
<td>Conference Call</td>
</tr>
</tbody>
</table>
SOUTHERN CALIFORNIA – ORANGE COUNTY: Positions available for full and part time BC/BE EM and Peds EM physicians. Partnership track is available for full time physicians. We are a stable, democratic group established in 1976 serving two best in class hospitals. St. Joseph Hospital is a STEMI center and Stroke Center with 80,000 visits per year. CHOC Children’s Hospital is a Level II trauma center, tertiary referral center and teaching hospital (several residency and fellowship rotations) with 80,000 visits per year. Excellent call panel coverage, excellent compensation, malpractice and tail coverage, and scribe coverage. Sign on bonus for full time hires.

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Department of Emergency Medicine
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**Napa Valley College**
Gregory Rose, EMS Co-Director
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**NCTI – National College of Technical Instruction**
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**Riggs Ambulance Service**
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**Rocklin Fire Department**
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**Rural Metro Ambulance**
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**Defib This (ERT)**
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**Verihealth/Falck Northern California**
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If you are an EMS Director and would like to provide chest, head shock-injury training to your team, contact California ACEP to get started!

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