

EM Resident

Official Publication of the Emergency Medicine Residents' Association

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VOL 48 / ISSUE 5

25 UNDER 45

INFLUENCERS IN EMERGENCY MEDICINE





Exciting opportunities at our growing organization

- Adult and Pediatric Emergency Medicine Faculty positions
- Medical Director
- Vice Chair, Clinical Operations
- Vice Chair, Research
- Medical Student Clerkship Director

Penn State Health, Hershey PA, is expanding our health system. We offer multiple new positions for exceptional physicians eager to join our dynamic team of EM and PEM faculty treating patients at the only Level I Adult and Level I Pediatrics Trauma Center in Central Pennsylvania.

What We're Offering:

- Salaries commensurate with qualifications
- Sign-on Bonus
- Relocation Assistance
- Retirement options, Penn State University Tuition Discount, and so much more!

What We're Seeking:

- Emergency Medicine trained physicians with additional training in any of the following: Toxicology, Ultrasound, Geriatric Medicine, Pediatric Emergency Medicine, Research
- Completion of an accredited Residency Program.
- BE/BC by ABEM or ABOEM

What the Area Offers:

We welcome you to a community that emulates the values Milton Hershey instilled in a town that holds his name. Located in a safe family-friendly setting, Hershey, PA, our local neighborhoods boast a reasonable cost of living whether you prefer a more suburban setting or thriving city rich in theater, arts, and culture. Known as the home of the Hershey chocolate bar, Hershey's community is rich in history and offers an abundant range of outdoor activities, arts, and diverse experiences. We're conveniently located within a short distance to major cities such as Philadelphia, Pittsburgh, NYC, Baltimore, and Washington DC.



PennState Health

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Stages of Success

Priyanka Lauber, DO

Editor-in-Chief, EM Resident

@PriyankaLauber

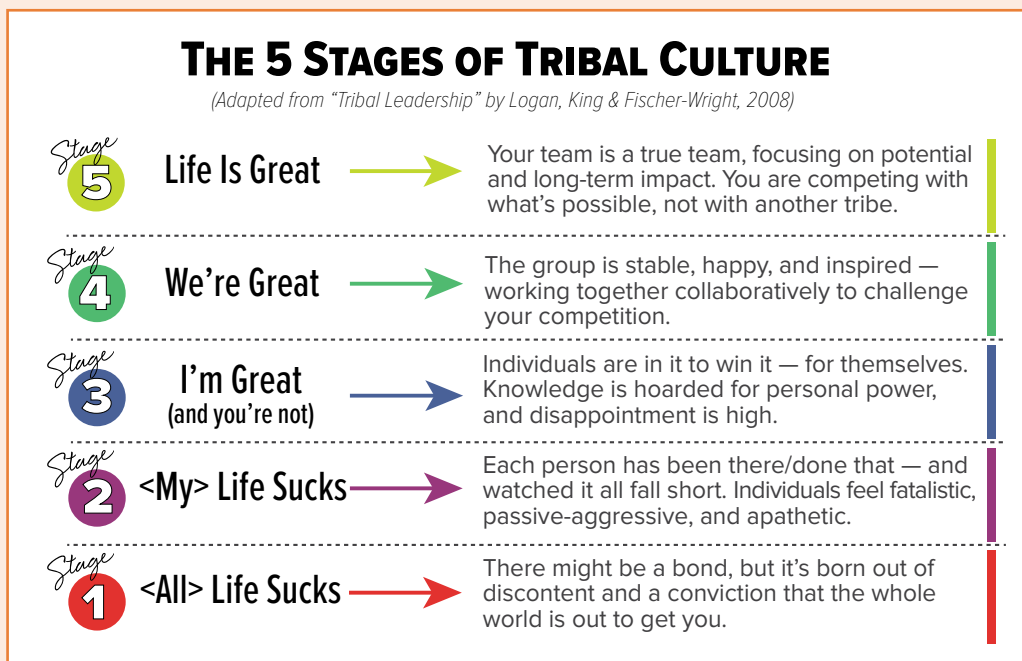
Hello EMRA Family!,

I cannot believe it's my last Editorial Forum as your *EM Resident* editor-in-chief. It's been such a whirlwind, with my tenure on the EMRA Board of Directors starting strong at ACEP19 in Denver. And then...COVID-19 turned the remainder of this 2-year term into a virtual experience. Even though that came with its trials and tribulations, one of the positives was that I witnessed a coming together of a tribe.

EMRA committee leaders, board members, and especially staff came together toward a common goal: to serve our members in a critical time. Innovative committee leaders worked closely with our staff to put together excellent educational

programming that had some of the highest turnouts in EMRA's history. We realized we could reach more members with virtual programming.

One of the important items that have helped organizations during this time of uncertainty has been culture! What is culture, especially organizational culture? An easy way to think about it is: "Culture is what someone does when no one is looking." It's essentially a shared set of beliefs and values that an organization's leaders establish. These values and beliefs are then later communicated and thus shape and influence employees' perceptions and behaviors.



I recently read a book called "Tribal Leadership" that has dramatically changed how I view culture within organizations. (I strongly recommend it). The book asserts there are 5 stages of tribal culture:

- **Stage 1.** "Alienated," "Undermining," "All life sucks." These are the members/leaders in the organization who are hostile and antagonistic.
- **Stage 2.** "Separate," "Apathetic Victims," "My life sucks." These are the members/leaders who are apathetic with quiet sarcasm, often judging without offering any passion for change or growth.
- **Stage 3.** "Personal Domination," "Lone Warrior," "I'm Great, and You're Not)." These are the members/leaders who believe they're the only one in the company who cares. They're the ones who believe winning is personal. They also hoard knowledge because of its power.
- **Stage 4.** "Stable Partnership," "Tribal Pride," "We're

Great." These are the members/leaders who are themselves and happy. They feel inspired and share core values and interdependent strategies with the ones around them. They feel like their entire organization is "great."

- **Stage 5.** "Team," "Innocent Wonderment," "Life is Great." These members/leaders make history, but they don't do it to beat out their competition; they do it because they're pushing the boundaries of possibility.

I took the time to share these ideas because they resonate. We all have had one or two people who crossed our minds with each stage. Ask yourself, which stage do you want to be part of?

Most high-functioning organizations will fall between stage 4 and stage 5. Most graduate students (including medical students) fall in Stage 2-3. Tribes make leaders, and leaders maintain tribes. So, I would implore all of you to assess yourself honestly, and strive to grow into a high-functioning stage 4 or 5. ★

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MEMBERSHIP BENEFITS

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Emergency Medicine Residents' Association



**FOR SOME OF OUR MOST ELITE SOLDIERS,
THIS IS THE FRONT LINES.**

As an officer working in Emergency Medicine for the U.S. Army health care team, you'll be on the front lines of medical innovation, practicing in world-renowned hospitals, clinics and health care facilities with access to the most sophisticated medical equipment in the field. With over 90 medical career specialties to choose from, you'll have the opportunity to participate in humanitarian efforts, learn innovative techniques and make a real difference in the lives of Soldiers and their families.

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20,000 Reasons to Serve

RJ Sontag, MD

EMRA President
Mid Ohio Emergency Services
@RJSontagMD

Autumn is the perfect time to reflect on the past year and to consider what we are thankful for. Looking back on my term as EMRA's president, I can think of about 20,000 reasons to be thankful.

20,000 happens to be the number of medical students, residents, fellows, and active alumni who now call themselves EMRA members. I am thankful for the trust you placed in me to represent your voice as we tackle some of the biggest issues this specialty has ever encountered.

In the past year, emergency physicians-in-training have faced obstacle after obstacle. We saw the release of the Workforce Report and the news that without serious changes, 20% of us may not have jobs in 10 years. There is no way to deny it: That news was a punch to the gut. It hurt. But being the scrappy young physicians that we are, we stepped up to design a future where we lead, with new solutions for safe and effective patient care. EMRA represents you at every workforce discussion, and our voice is strong. We continue to advocate for the solutions you support, including:

- Ensuring any changes to residency training are centered on evidence-based objectives, rather than arbitrary training obstacles without educational merit;
- Protecting your ability to choose a 3- or 4-year training environment;
- Fighting to ensure medical decisions are evidence-based, rather than profit-driven;
- Ensuring physicians directly lead patient care, while preventing interference in the training environment from non-physician providers;
- Shaping acute, unscheduled care for future needs, while expanding opportunities for traditional emergency medicine practice;
- Working with employers to honor the contracts they sign with senior residents.



Of course, workforce changes were not the only thing our specialty faced: COVID-19 numbers continued to fluctuate. EMRA stayed nimble and found ways to support you and the patients you care for. The 8,000+ members (!) of EMRA committees created tons of virtual events and resources to keep you up-to-date on practice changes to help you be the best physician you can be. We designed conferences that were not only educational and enjoyable, but also safe and broadly inclusive. And we partnered with other EM organizations to lead the creation of standards for the residency application cycle.

EMRA fights for you on so many fronts because you deserve it. We are proud to help you become the best physician you can be, the best leader you can be, and to do our part to help emergency medicine be the best specialty we can be. I am forever thankful for the opportunity you gave me to lead through these challenges.

I would be remiss if I did not use my last President's Message in *EM Resident* to say thanks to some of the people who supported me on this journey. Thank you to **Dr. Andy Muck**, PD extraordinaire, who nudged me forward and reigned me in at just the right times; to **Dr. Gillian Schmitz**, who saw something in me that I did not yet see; to **my co-residents** and **the team at UT Health San Antonio**

(especially co-chiefs **Drs. Bonita Nuanez** and **Walker Graham** and our superhero PC **Melissa Villanueva**), who bent over backwards to support my EMRA service while still making fun of me when I got too serious; to **EMRA's small but mighty staff**, who execute a shocking number of projects on a shoestring budget and timeline; to **EMRA's board, committee leaders, program representatives, and appointed leaders**, whose robust debate and interest in leadership development make EMRA without question the best organization in all of EM; and to **Krystle Altstaetter, Beth Hull, Dr. Greg Decker, and the whole team at Mid-Ohio Emergency Services**, who continue to find ways to create a work environment that allows for volunteer service.

Thank you also to my family and friends for your support. Thank you to **my husband, Ben**, who knows when to listen, when to help, when to challenge, and when to step back; to **my family**, who accepted my canceled RSVPs with grace; and to **my friends**, for the missed times together, but especially for that time when I was on a conference call at brunch—sorry to be that guy.

And finally, thank you to **all of you** for your continued confidence in EMRA. You give me 20,000 reasons to smile, to fight, and to serve every single day. ★



FY 2021 Annual Report

Membership: 19,984

>95%

of EM Residents are EMRA members

228



programs with 100% membership

>\$2.25M

annually invested into members

4.8%

revenue growth

EMRA helps you become the

BEST DOCTOR

you can be.



9 new or newly revised EMRA guides and EMRA reference cards

36 on-shift clinical resources free for EMRA members



104,921



downloads since July 2018

85,000 EM Resident

average monthly online views

and print distribution of 18,000

>500,000 EMRA Match

searches of EMRA Match for:

- Residencies
- Fellowships
- Clerkships
- Jobs

EMRA helps you become the

BEST LEADER

you can be.



20 committees

200+ meetings, webinars, publications

>8,000

members of EMRA's 20 Committees

- Medical students
- Residents
- Fellows

104 funded national leadership opportunities for members

92

Leadership Academy fellows



43

categories of awards, scholarships, and grants

- Scholarship
- Leadership
- Professional excellence

EMRA helps EM become the

BEST SPECIALTY

we can be.



Workforce

EMRA helped fund research into the workforce issues facing EM and continues to take part in task force actions to **protect and shape** the future of the specialty

23

Webinars, vides, and online resources developed in response to the pandemic

19

Resolutions proposed and debated by EMRA members and the Representative Council

- Fair compensation
- Injury/illness consideration
- Parental leave policies
- On-shift nutrition/hydration
- Protection against program closures

3

EMRA and ACEP Health Policy Academy Fellows

10

partnerships to advance our mission (ACEP, EMF, EMAF, NEMPAC, EDPMA, AFFIRM, FemInEM, PolicyRx, AMA, Essentials of EM, AEROS)

Thank you!

Supporting EMRA @ ACEP21



ADVANCING EMERGENCY CARE 



(Current as of 9/15/21)

25 UNDER 45

INFLUENCERS IN EMERGENCY MEDICINE

In a watershed era for the world — as emergency medicine continues to carry the weight of a pandemic on its shoulders — EMRA is honored to celebrate influencers who are shaping the future of our communities, our hospitals, and our specialty.

Their contributions range from tech innovations to stellar medical mentorship and education to outreach that changes the care their communities receive.

**We are proud to introduce these
25 Under 45 Influencers of EM
for 2021.**

Learn more about them at emra.org.

Andreia Alexander, MD, PhD, MPH

@dr_dreiaEM

Assistant Professor of Emergency Medicine
Assistant Program Director, Indiana University



After completing graduate research in health disparities in STI and HIV prevention, Andreia Alexander earned an MD/PhD in Health Behavior, focusing on sexual and reproductive health. Her focus has simply sharpened during her rise as an emergency physician in academic

medicine, culminating in a \$60,000 Changemakers in Family Planning award, recognizing her work in implementing patient-centered reproductive health options for vulnerable populations.

Heidi Best, MD, FACEP

President, Emergency Physicians of Tidewater
Eastern Virginia Medical School/Sentara Norfolk
General Hospital



As the first female president in the 50-year history of her private, democratic group, Heidi Best faces all the challenges inherent in healthcare today — compounded by pandemic pressure and the hurdles placed before new leaders. Dr. Best, president-elect of

the Emergency Medicine Business Coalition, has navigated such difficult times while establishing herself as a mentor, advocate, and visionary “you usually only read about in leadership books.”

Jeremy Berberian, MD

@jgberberian

Associate Director of Resident Education
ChristianaCare Emergency Medicine Residency



Drawing on a unique background as an educator and professional jazz drummer, Dr. Berberian has become an international author on rhythms of the heart. His contributions to resident education include the creation of the Foundations of Emergency Medicine Foundations II

curriculum, co-authoring a chapter in the most recent edition of Tintinalli’s, and co-authoring EMRA’s newest guide, Emergency ECGs: Case-Based Review and Interpretations, with Amal Mattu and William Brady.

Medell Briggs-Malonson, MD, MPH

@MedellBriggsMD

Chief, Health Equity, Diversity and Inclusion, UCLA
HealthHealth Sciences Associate Clinical Professor,
David Geffen School of Medicine at UCLA



Medell Briggs-Malonson is dedicated to advancing health equity and inclusive excellence within UCLA Health and the Los Angeles community. She is known for national lectures on implicit bias in healthcare and innovative methods to advance health equity in

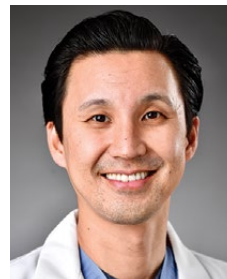
diverse communities. An active volunteer, Dr. Briggs-Malonson has earned numerous awards at the local, state, and national level.

“He is an avid advocate for trainees and strives to make “doctors better learners.”

Bernard Chang, MD, PhD, FACEP

@bernardchangmd

Vice Chair of Research, Associate Professor
of Emergency Medicine
Columbia University



With a PhD in psychology alongside his EM credentials, Bernard Chang has risen to the forefront of wellness in the wake of COVID-19. Dr. Chang’s NIH-funded work on psychological stress and its impact on cardiovascular health among emergency medicine clinicians

is expected to become landmark research, and he is a leading advocate for destroying the stigma attached to seeking mental healthcare in medicine.

John R. Corker, MD, FACEP

@JohnnyC_IrishMD

Partner, Emergency Medicine Specialists
Adjunct Community Faculty, Wright University and
Grandview Medical Center Residency Programs



ACEP YPS Chair John Corker has spent the past 2 years encouraging, empathizing, motivating, and advocating for young physicians dealing with workforce pressures, COVID-19 stressors, and life milestones. Such outreach has been his nature since medical school,

when he and 3 fellow students created Radio Rounds, a podcast that eventually inspired EMRA*Cast and ACEP YPS's newest webcast venture: EM LIFERS.

The future of emergency medicine is more than just the care of individual patients – it's about the care of populations – and she is leading the way.

Abra Fant, MD, FACEP

Residency Program Director, Assistant Professor
Northwestern University Feinberg School of Medicine
Director of Patient Safety and Quality Improvement
McGaw Medical Center at Northwestern University



As the medical director for Northwestern's Academy for Quality and Safety Improvement, Dr. Abra Fant demonstrates how to connect the dots between metrics and meaningful improvements in patient care — leading the way for her trainees and colleagues alike.

She encourages scholarly research and serves as a reviewer for multiple top-tier journals, while dedicating herself to mentorship, diversity, equity, and inclusion — not only in healthcare but also in academic medicine.

Katrina Gipson, MD, MPH

@DrKatrinaGipson

Assistant Professor, EM
Emory University School of Medicine



As the founding director of Emory University's Health Policy Fellowship, Katrina Gipson strives to foster innovation and awareness in public health. Dr. Gipson is a co-principal investigator on NIH-funded research into emergency care for older adults — and also

serves as a featured speaker for local elementary schools' career days, encouraging public health awareness, mentoring underrepresented minorities to join her in bringing medicine to every community.

Brad Gable, MD, MS, FACEP

@OHSimDoc

Emergency Physician, System Medical Director
OhioHealth Simulation



Dr. Gable is using his expertise in simulation to revolutionize emergency medicine. The first to complete a fellowship in medical simulation in Ohio, his influence has been felt through numerous simulation programs and in simulation-based training and education — even

reaching to India and Asia via SimWars. His passion is evident through his work in EMS education, bedside teaching, simulation research, and mentorship. He brings expertise and innovation to real-time crises.

Michael Gottlieb, MD, FAAEM, FACEP

@MGottliebMD

Associate Professor, Department of Emergency
Medicine, Rush University Medical Center



As a scholar, mentor, and collaborator, Michael Gottlieb's influence is foundational. His publications, grants, speaking engagements, and resident and fellow training have garnered accolades from residents and faculty alike. In co-creating the Diversity Inclusion Research

and Education Collaboration Team, he is advancing research to improve equity in medical education. His leadership is helping to create sustainable programs and further innovative teaching in EM.

He is consistently recognized for his talents and leadership; he's the future we want for emergency medicine.

Chadd K. Kraus, DO, DrPH, MPH, CPE

System Director, Emergency Medicine Research Associate Professor, Geisinger Commonwealth School of Medicine

Associate EM Residency Program Director, Geisinger



Leadership, mentorship, advocacy, and scholarship are the pillars of Dr. Kraus's career. He is a former EMRA leader, ACEP Young Physicians Section chair, and now President-Elect of the Pennsylvania College of Emergency Physicians, a member of the Board of Trustees of EMF, and mentor to medical students and residents alike. With a background in research and systems improvement, Dr. Kraus focuses on workforce, public health, and policy issues.

Daniel Grossman, MD, MBA

@GrossmanDaniel

Chief Medical Officer, Best Buy

Assistant Professor of Emergency Medicine, Mayo Clinic College of Medicine and Science



Dr. Grossman holds a unique and powerful vantage point for his patients: from the seat of his wheelchair. He began his career as a healthcare executive while maintaining a part-time practice at Mayo Clinic. In 2018, after months of rehabilitation following a mountain biking accident, he returned to his

clinical practice and joined Best Buy as its first-ever Chief Medical Officer transforming healthcare through technology.

Joshua Lesko, MD

@joshualeskoMD

Emergency Medicine Resident

Naval Medical Center Portsmouth



Josh Lesko's work in the COVID era — as a key contributor to Jeremy Faust's BRIEF 19 daily research summary and a member of his hospital's COVID response response team — mirrors his commitment to education and advocacy in EM.

Dr. Lesko has served as a voting member of the AMA House of Delegates since medical school, has served on the AMA-RFS Governing Council, and has been a primary investigator for research conducted through the Naval Medical Center's Combat Trauma Research Group.

Rohini J. Haar, MD, MPH

@rohinihaar

Adjunct Professor, UC Berkeley School of Public Health Kaiser Medical Center, Oakland

Medical Advisor, Physicians for Human Rights



Protecting patients in crisis is the foundation of this specialty, and Dr. Rohini Haar's research, publications, and practice have focused on the most urgent needs of patients facing human rights violations, both in the U.S. and abroad. She is particularly

interested in the protection of health workers and health services in crisis settings.

Lisa Maurer, MD, FACEP

Emergency Physician

Emergency Medicine Specialists



Advocacy is a language Dr. Maurer speaks fluently. She championed improved Medicaid reimbursement and fought for budget increases for reimbursement in her state. She was instrumental in the fight to allow independent emergency physicians to apply

for state CARES act dollars. Her ability to network, motivate her peers and work across interest groups to accomplish goals is powerful voice for emergency physicians.

Luke Messac, MD, PhD

@LukeMessac

PGY4, Rhode Island Hospital & Brown EM Residency



From his work in rural Malawi to the halls of Harvard, Luke Messac has kept a steady eye on his goal: bringing quality care to every patient. As a physician-historian trained in the University of Pennsylvania's MD/PhD program, Dr. Messac studies the causes and

consequences of scarcity in health care delivery. At a time when virtually all of our clinical environments are affected by shortages of staff, space, and supplies, his work helps us understand where scarcity comes from, and how to address it.

Comilla Sasson, MD, PhD, FACEP, FAHA

VP for Science & Innovation for Emergency

Cardiovascular Care, American Heart Association

CEO/CMO at CO2 Check

Emergency physician, Colorado Permanente



Dr. Sasson is committed to working to decrease health disparities, and to use a community-based participatory research approach to identify and implement solutions to improve the health and wellbeing of community members. She also serves as

the PACT Council Chair, bringing communities and academics together to work on important health topics.

Onyeka Otugo, MD, MPH, MPA

@OnyekaOtugo

Director of Research, Office of IDEaS

Brigham and Women's Hospital



A former EMRA Health Policy Academy Fellow, Onyeka Otugo is a force for diversity, equity, and justice — for colleagues and patients alike. She has launched a fellowship program to increase the representation of Black women physicians in leadership roles,

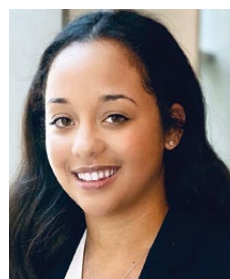
researched public health policy's downstream effects on minority populations, and built bridges within medicine and the community to improve awareness and care.

Jazmyn Shaw, MD

@JazmynShaw1

Emergency Medicine Resident

University of Cincinnati



If you were a medical student or an advisor in 2020, you learned Jazmyn Shaw's name and saw it frequently. As a national leader in EM (and chair of the EMRA Medical Student Council), Dr. Shaw offered guidance and reassurance during a pandemic match cycle

— while facing the same challenges herself. She has served on the board of Black Girl White Coat and is "the type of leader you can only hope to come across once in a lifetime."

Melissa Parsons, MD, FACEP

@MEParsonsMD @sheMDtweets

Assistant Residency Director, University of Florida

College of Medicine – Jacksonville

Co-founder, sheMD



A passionate advocate for women in emergency medicine, Melissa Parsons is speaking out about gender equity, physician wellness, and physician infertility. Beyond publications and national speaking engagements, she provides authentic mentorships, discussion, and

outreach to women in medical training through sheMD, a virtual space she co-founded to equip women with tools necessary to succeed in medicine.

“Her advocacy, compassion, and dedication improve our healthcare system and embody what this award represents.”

Randy Sorge, MD, FACEP

*Assistant Program Director LSU "Spirit of Charity"
Emergency Medicine Residency Program, New Orleans*



Randy Sorge's energy and enthusiasm are changing the future of medicine. While challenging the traditional didactic model with innovative ideas as head of the Curriculum Development for the residency program, he also advocates for well-being for the retention

of future emergency medicine professionals. He has masterfully promoted equity and inclusion in the residency recruitment process and has been instrumental in championing diversity.

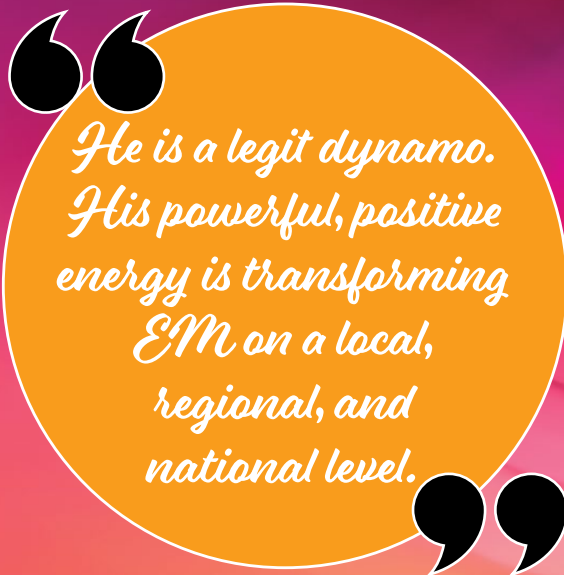
Felipe Teran, MD, MSCE, FACEP

*@FTeranMD
Assistant Professor of Emergency Medicine
Weill Cornell Medicine*



Felipe Teran is a defining expert in the the field of critical care ultrasound, transesophageal echo-cardiography and cardiac arrest resuscitation. He has trained over 800 emergency medicine and intensive care clinicians globally. Through

numerous publications, national and international presentations, and workshops, he is revolutionizing emergency care.



Derrick Tin, MD

*@DrDerrickTin
Senior Fellow Disaster Medicine, BIDMC and
Harvard Medical School
Medical Director, AlphaZodiac Medical Advisory*



Promoting the study of disaster and emergency medicine is Derrick Tin's passion. While working the frontlines of COVID-19, he continues to publish on the healthcare consequences of terrorism, bioterrorism and vulnerabilities in hospital preparedness and responses. As

co-chair of the Counter-Terrorism Medicine Specialist group at WADEM, his expertise is unsurpassed. Global socio-political landscapes continue to shift, and Dr. Tin is ready to meet those challenges.

Breen R. Taira, MD, MPH, CPH, FACEP

*Associate Professor of Clinical Emergency Medicine
UCLA David Geffen School of Medicine Director of
Social Medicine, Olive View-UCLA*



If "language justice" and "immigration informed care" are familiar terms, it is a credit to Breena Taira's advocacy efforts. Through research, fellowship, and curriculum development she is preparing emergency physicians to work in careers at the intersection of health equity

and EM. Through coordinating initiatives related to social determinants of health, identifying approaches to improve clinical outcomes, and reducing barriers to access she is transforming patient-centered care.

Kabir Yadav, MDCM, MS, MSHS, FACEP

*Vice-Chair for Academic Affairs, Harbor-UCLA
Associate Professor of Clinical Emergency Medicine,
UCLA David Geffen School of Medicine
Investigator, The Lundquist Institute*



As a dedicated problem-solver, Dr. Yadav is drawn to the challenge of delivering health equity to the bedside. While authoring dozens of articles and grants, he also advocates for students, residents and fellows, inspiring others. Building on a foundation of

two master's degrees, two board certifications, and a strong academic track record, he has pursued research projects collaboratively to address the most immediate concerns of the underserved.

EXCELLENCE IN EM

Announcing EMRA's Fall 2021 Award Recipients

EMRA strives to help you be the best doctor and leader you can be, helping to make emergency medicine the best specialty it can be. These outstanding physicians and trainees have gone an extra mile — help us honor their accomplishments.

Joseph F. Waeckerle, MD, FACEP, Alumni of the Year

Cedric Dark, MD, MPH | Baylor College of Medicine

Faculty Mentor of the Year

Jessica Oswald, MD | UC-San Diego

Faculty Teaching Excellence Award

Michelle Lin, MD | UC-San Francisco

Steve Tantama, MD, Military Excellence Award

Haley Dodson, MD | Naval Medical Center San Diego

Augustine D'Orta Humanism Award

Larissa Unruh, MD | Cook County Hospital

Be The Change Project Grant

Jacob Garcia | Thomas Jefferson University

Clinical Excellence Award

Sarah Wolochatiuk, MD | University of Cincinnati

FOAM(er) of the Year

Rahel Gizaw, MD | Emory University

EMRA Simulation Research Grant

Imikomobong (Micky) Ibia, MD | Harvard Affiliated Emergency Medicine Residency

TRAVEL SCHOLARSHIPS

EMRA/ACEP Medical Student Elective in Health Policy

Leslie Gailloud | University of Maryland

Naeha Haridasa | George Washington University

Kelly Stewart | University of Washington

EMRA/ACEP Resident-Fellow Health Policy Elective in Washington, D.C.

Sophia Gorgens, MD | Zucker School of Medicine-Northwell at North Shore/Long Island

International EM Rotation Scholarship

James Ford, MD | UC Davis

EDDA Travel Scholars

Royale Nichols, MD | Hackensack Meridian/Hackensack University Medical Center

Joseph Gannett, MD | LSU New Orleans Spirit of Charity Emergency Medicine Residency

CORD Academic Assembly Travel Scholars

Kathryn Ritter, MD | Oregon Health & Science University

LAC Travel Scholars

Anna Yap, MD | UCLA Ronald Reagan/Olive View

2021 — Meet Your Way

EMRA AT ACEP21

Many of our #EMRAfamily are unable to travel in the near future, so EMRA is moving forward with a broadly inclusive, hybrid approach to our **EMRA events @ ACEP21**. We will hold some events on-site in Boston and some events via a virtual platform.



Virtual and Free Attendance

ALL EASTERN TIME

Thursday, October 21

7p – 10p EMRA Resolution Review and Public Hearing

Saturday, October 23

1p – 5p EMRA Medical Student Council Meeting

Sunday, October 24

4p – 6:30p EMRA/ACEP Leadership Academy
Supported by VapoTherm



Monday, October 25

12:30p – 5:30p Case-Con Residents
Case-Con Medical Students
EMRA Committee Programming



Tuesday, October 26

9a – 10a EMRA Rep Council Registration
10a – 3:30p EMRA Rep Council and Business Meeting
9a – 3p EMRA Resident SIMWars Competition



Wednesday, October 27

1p – 3p EMRA 20 in 6
Supported by Hippo Education
5p – 7p EMRA Airway Stories

Case-Con Competition

This virtual collection of interesting cases is some of the most high-yield programming you'll find.

Check emra.org/sa for attendance link.



Join us for this virtual event!

Monday, Oct. 25

12:30 – 5:30 pm

EMRA's 20 in 6 Resident Lecture Competition

Help us find the best resident lecturer in all the land
– without even leaving your chair.

Join us for this virtual event!

Wednesday, Oct. 27

1pm – 3pm

Check emra.org/sa for attendance link.

This event is supported by **HIPPO**
EDUCATION



In-Person in Boston

ALL EASTERN TIME

ATTENDEES MUST ADHERE TO ACEP MEETING POLICIES

Monday, October 25

5p – 7p EMRA Job & Fellowship Fair

BCEC Hall C

Supported by emCareers.org, Vituity, and TeamHealth

Thursday, October 28

7a – 5p EMRA MedWAR

Blue Hills Reservation | Milton, MA

25 Under 45 Influencers in EM and EMRA Awards: Reimagined

We love to put our stars in the spotlight, and this year we are reimagining the VIP ceremony for our 25 Under 45 recipients, award winners, and VIPs. Stay tuned for details of this event!

25 UNDER 45
INFLUENCERS IN EMERGENCY MEDICINE

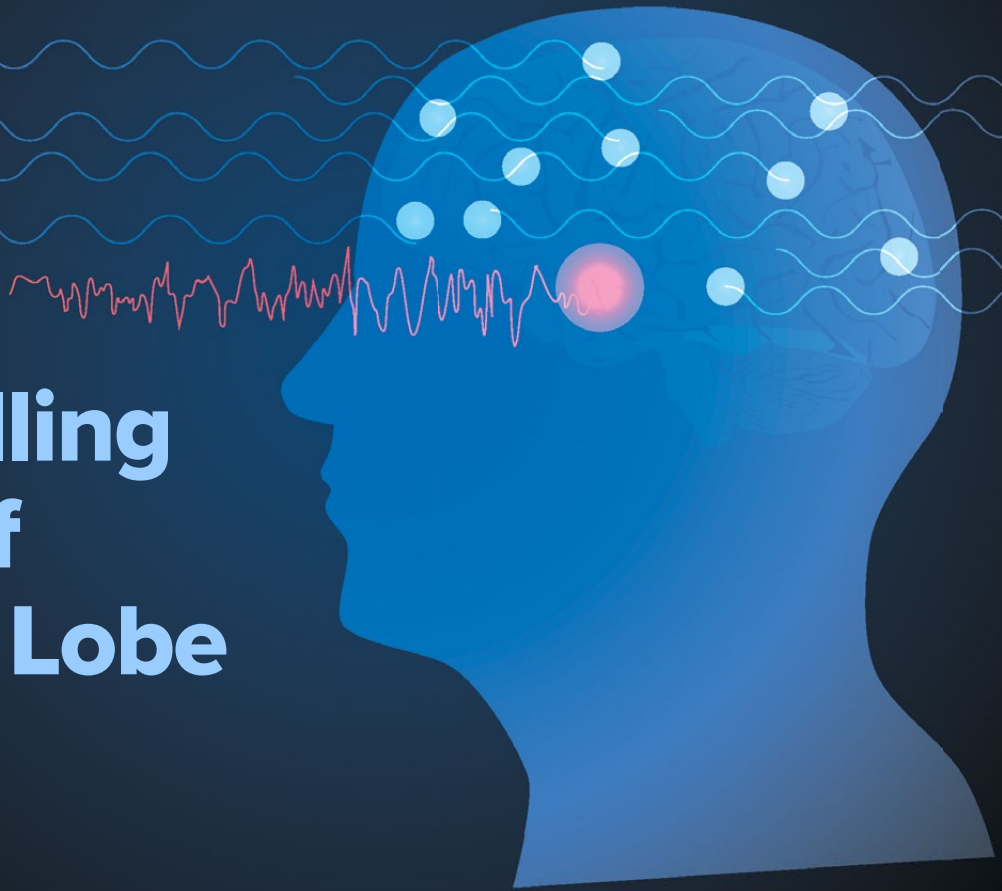


Visit www.emra.org/sa
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Visit emra.org/sa for the most current event details, registration links, and access. All times listed are Eastern.

A Compelling Finding of Temporal Lobe Epilepsy



Kiran Akbani

William Carey University College
of Osteopathic Medicine
Class of 2022

Kevin Hargrave, MD

Neurology

Our Lady of Lourdes Regional Medical Center

Aaron Tiffée, MD, FACEP

Attending Physician

Our Lady of Lourdes Regional Medical Center

Here we examine a case of a middle-aged male who presented to the ED for headache-like symptoms and was subsequently found to have a right temporal lobe mass upon magnetic resonance imaging.

Introduction

The temporal lobe is the most common site of origin of partial, also known as focal, seizures.¹ Partial seizures are the most common seizure type in adults and usually occur in the mesial, or middle, temporal lobe. The most common cause of temporal lobe epilepsy (TLE) in middle-aged adults is hippocampal or mesial temporal sclerosis secondary to neuron cell death, accounting for over 80% of TLE cases.¹ Other less frequent causes include tumors,

infection, perinatal injuries, vascular malformations, encephalitis, and genetic mutations.¹ TLE can be further broken down into two types. Simple partial, or focal aware, seizures occur without impairment of consciousness and can be subdivided into motor and non-motor (somatosensory, autonomic, and/or psychological) seizures.² Complex partial, or focal impaired, seizures involve some degree of altered consciousness and are often preceded by a simple partial seizure, typically an aura that lasts anywhere from seconds to minutes before the impairment of consciousness occurs.³

Case

A 40-year-old male with a past medical history of migraines, anxiety, depression, and hyperlipidemia presented to the ED for evaluation of a sensation in his head that he described as pressure and fullness. He further elaborated that this sensation was “not a headache” and unlike his past migraines. He had experienced similar episodes in the past, though they occurred 1-2 times a month for years and lasted for 15-20 minutes. However, this episode began

the day prior to arrival while at work as a schoolteacher and lasted several hours.

This episode was associated with difficulty breathing, nausea, chills, diaphoresis, feelings of anxiety, hypersomnolence, difficulty walking straight (which the patient described as though he was “drunk” when walking), and altered sensation of smell (which he describes as “abnormal smells”).

An MRI of the brain demonstrated an area of signal changes consistent with a mass effect in the mesial right temporal lobe. Neurology evaluated the patient and started him on levetiracetam 750 mg every 12 hrs. He was admitted to the hospital for further evaluation and symptom control.

Discussion

The complexity and variety of signs and symptoms associated with temporal lobe epilepsy make this condition notably difficult to diagnose.⁴ This patient demonstrated features that walk the line of simple versus complex partial.

He had an aura (unpleasant smells) and likely postictal state (hypersomnolence, “feeling drunk”

while walking), which are both typical of complex partial seizures.³ However, he did not experience any loss of consciousness, which is a defining component of complex partial seizures.⁶ He also did not report typical automatisms (such as chewing and lip-smacking) that often precede and are predominant in complex partial seizures, occurring in about 40-80% of patients with temporal lobe epilepsy.³

Our patient also demonstrated autonomic and somatosensory alterations that are common in simple

partial seizures.² This was evidenced by olfactory hallucinations and a multitude of autonomic dysfunctions, including nausea, diaphoresis, and chills. Though difficult to tease out in our patient secondary to his underlying history of anxiety and depressions, psychological features are a common presentation of non-motor simple partial seizures.² Interestingly, complex partial seizures have also been found to be first misdiagnosed as a primary psychiatric illness.⁷ Therefore both simple and complex partial seizures should be kept

on the differential diagnosis of acute and transient psychotic behavior, particularly irrational and aggressive behavior.⁴

Overall, this patient demonstrated symptoms of both simple and complex partial seizures. His multitude of symptoms highlights the complexity and often difficult diagnosis of temporal lobe epilepsy. Of note, a direct cause, such as a mass effect, is not found in up to 25% of TLE cases, which can further delay diagnosis.⁸

Case Conclusion

During admission, the patient was continued on his regimen of Keppra 750 mg BID and did not experience any further episodes overnight. He was discharged the following day and followed up with neurology and neurosurgery for MR spectroscopy and further management. Post-admission, he experienced some seizure activity and was switched to oxcarbazepine, which he

tolerated well aside from experiencing some fatigue. The pathology of his tumor showed a “multinodular vacuolating neuronal tumor” and he subsequently underwent a full surgical resection of the tumor, and has been doing well at the time of this publication. ★



FIGURE 1. TRA T2-weighted TSE MRI
Demonstrating signal changes and mass effect within the mesial right temporal lobe

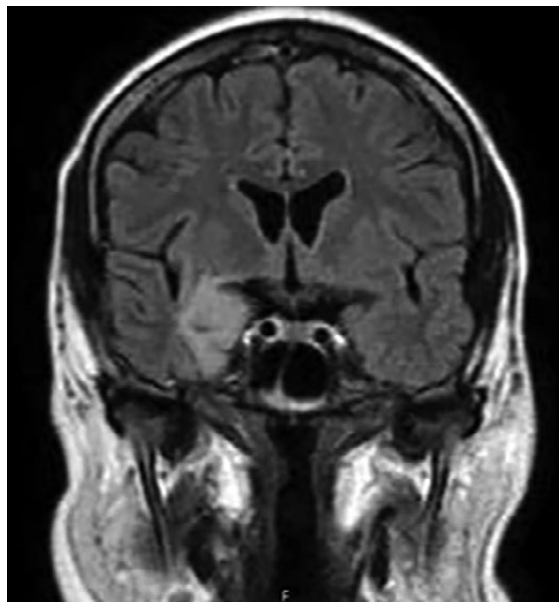


FIGURE 2. Coronal FLAIR MRI

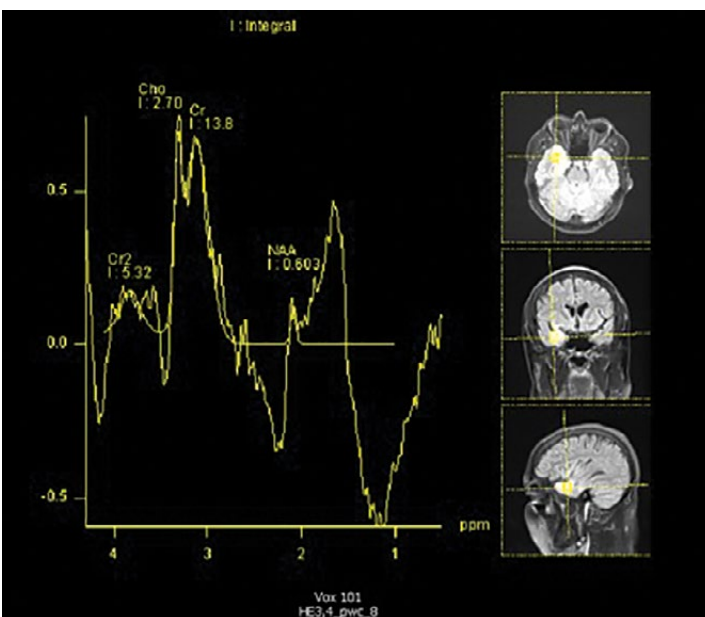


FIGURE 3. MRI Proton Spectroscopy



FIGURE 4. Head CT without contrast



Acknowledgments:

We want to express sincere gratitude and appreciation to Cara Joyce, PhD, Director, Biostatistics Core at Loyola University Chicago for completing the statistical analysis of this project.

Knowledge and Practice of Emergency Medicine Healthcare Teams Regarding the **ASK Campaign and Firearm Safety**

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Unintentional firearm injuries are a preventable problem within the pediatric population, and many of these could be avoided with proper firearm storage. The Asking Saves Kids (ASK) campaign recommends that parents ask adults in whose homes their children spend time about the presence and storage of firearms.

No known studies have examined emergency clinicians' comfort level and

knowledge on these topics. The goal of this study was to describe emergency healthcare teams' knowledge and behaviors regarding the ASK campaign and firearm safety and to measure the benefits of providing an ASK education.

METHODS: This study took place at an urban hospital ED. Participants were EM physicians and RNs, who were chosen voluntarily. They completed a pre-intervention survey, an

intervention, and a post-intervention survey. The intervention consisted of sharing ASK pamphlets and providing a 5-minute verbal training. The post-intervention survey was completed typically within 1-2 days of the intervention. Data were compiled, and statistical analysis was performed.

RESULTS: 86.8% of participants initially reported that they rarely or never discussed firearm safety. 50.5% of pre-survey participants and 81.6% of post-survey participants felt comfortable discussing firearm safety. Similarly, the average percentage of correct responses to the knowledge questions increased from pre- to post-survey: 36.8% to 76.2%, respectively.

CONCLUSIONS: This intervention was sufficient to improve clinicians' knowledge in firearm safety and comfort in discussing firearms. Universal firearm training would allow more caregivers to receive proper information on how to safely store their firearms and minimize accidental pediatric injuries.

Introduction

Firearm safety has become a growing concern in the U.S., yet it is not a common point of discussion in an average clinical visit, with only 25% of

physicians surveyed reported discussing firearm safety often or very often with patients.^{1,9} The Asking Saves Kids (ASK) campaign was promoted with the intent that parents or caregivers should ask if there is an unlocked firearm where their children will be playing.⁸ A study conducted by Dr. Agarwal, et al in NYC found that 96% of caregivers felt that physicians should provide ASK education, and 85% of caregivers who received ASK training felt comfortable asking if there is a firearm where their child plays.² Another study reported that 75% of parents agreed that pediatricians should advise them regarding the safe storage of firearms within the home.³ These studies demonstrate that caregivers are willing to discuss firearm safety, but no studies have examined emergency healthcare clinicians' comfort level and knowledge on these topics. Intervention in the ED has previously been shown to be effective in increasing patient awareness. Specifically, a study has shown that ED teams were able to effectively deliver smoking cessation counseling to their patients in a time-efficient manner.⁴ Our study hypothesizes that the same concept could apply to increase firearm safety counseling and awareness in the ED setting.

Nearly 1300 children die and 5790 are treated for gunshot wounds each year.¹² From analyzing all patient data from the U.S. National Trauma Data Bank, years 2009 to 2014, Cutler, *et al.* found that, of 466,403 pediatric ED visits, 21,416 (4.6%) resulted from a firearm injury.¹³ Additionally, from their analysis, patients visiting EDs for firearm-related injuries had more than 7 times mortality compared to other injuries, and firearm injuries were responsible for more than a quarter of the total pediatric deaths.¹³ Thus, emergency medicine physicians and nurses are often the front line for treating patients who have been injured by firearms, and the likelihood of severe injury and mortality is higher when associated with firearms.

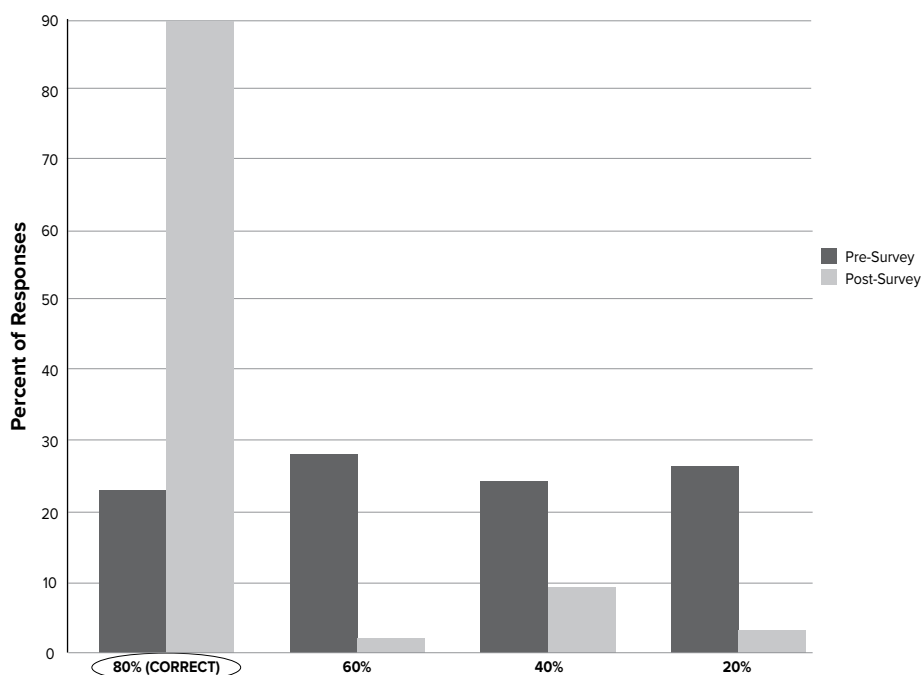
The purpose of this study was to describe emergency department healthcare teams' knowledge and behaviors when it comes to the ASK campaign and firearm safety before and after a brief educational intervention about the ASK campaign. Additionally, this study aimed to assess if there was a difference in comfort discussing the ASK campaign within varying clinician demographics.

Methods

Emergency medicine physicians and nurses were recruited at an urban level 1 trauma center hospital emergency department. This entire study and intervention took place pre-COVID pandemic from August to October 2018. Participants completed a voluntary pre-intervention survey, and afterward, a brief educational intervention was performed, sharing ASK pamphlets with clinicians and providing a 5-minute verbal training based on the Asking Saves Kids campaign website.⁸ Participants were then asked to complete a voluntary post-intervention survey, typically within two days of the intervention.

The surveys were designed to assess clinicians' knowledge about firearm prevalence and safe storage practices as well as their comfort level presenting the information to caregivers of children. The knowledge questions included: the percentage of homes with kids that have guns (33%), the percentage of parents who keep a gun loaded (25%),

FIGURE 1. Percent of Unintentional Firearm Deaths of Kids Occur in the Home



the percentage of unintentional firearm deaths of kids that occur in a home (80%), whether doctors and nurses are comfortable discussing firearm safety with caregivers during ED visit, and whether clinical teams consider themselves familiar with proper firearm storage practices. Additionally, the first survey asked whether the participant: discusses firearm safety with adult patients, discusses firearm safety with caregivers of pediatric patients, and whether they are familiar with ASK. The post-survey asked if they are comfortable discussing firearm safety with caregivers of pediatric patients after receiving training, if they think this information is valuable for all clinicians, and if they are willing to share ASK information with the caregiver of every pediatric patient.

Data were compiled using RedCap software, and statistical analysis was performed. Descriptive statistics were reported for pre- and post-survey responses. The statistical significance of differences in responses by participant characteristics was performed using chi-square or Fisher's exact tests as appropriate. This study was approved by the IRB and all investigators completed appropriate CITI training. Patients and the public were not involved in the design, conduct, reporting, or dissemination plans of our research.

Results

91 physicians and nurses participated in the pre-survey and 49 of those participated in the post-survey over the course of three months. Emergency medicine teams' knowledge of ASK campaign statistics was significantly improved after the 5-minute verbal intervention. Specifically, the correct responses to knowledge questions increased from pre- to post-survey: 42.7% vs 73.5% knew that 1 in 3 homes with kids have at least one gun, 44.9% vs 69.4% knew that one-quarter of parents with guns keep one loaded, and 22.7% vs 85.7% knew that 4 in 5 unintentional firearm deaths of kids occur in a home.

Additionally, clinicians' comfort in relaying this information to patients significantly increased. The percent who felt comfortable discussing firearm

safety with caregivers during ED visits increased from 50.5% among pre-survey participants to 81.6% among post-survey participants.

Prior to the intervention, most reported that they rarely ($n=27$, 29.7%) or never ($n=52$, 57.1%) discussed firearm safety with adult patients or with caregivers of pediatric patients. Frequency of and comfort with a discussion of firearm safety did not differ by respondent age, gender, role, or parenthood ($p>0.05$ for all comparisons, data not shown).

Following the intervention, 87.8% ($n=43$) indicated a willingness to share ASK information with the caregiver of every pediatric patient. Participants self-reported to find the ASK information useful to them in practice, with 91.8% believing that this info is valuable for all healthcare teams. Comfort in talking about proper firearm safety and storage was reported as improved after receiving the intervention, with 87.8% willing to share ASK information with the caregiver of every pediatric patient.

Of physicians and nursing staff in the level 1 trauma center emergency department approached, 91 completed a pre-intervention survey. The majority of respondents to the pre-survey were less than 45 years old ($n=67$, 74%), female ($n=74$, 81.3%) and nurses ($n=73$, 81.1%). Nearly half were parents of children under 18 ($n=42$, 46.2%) and one fifth ($n=19$, 20.9%) owned a firearm.

Discussion

With this brief intervention in the ED, this study hoped to empower healthcare teams to ask guardians about proper firearm storage and spread the message of the ASK campaign in hopes of reducing accidental firearm-related incidents in the community.

According to multiple prior studies, 80% of unintentional firearm deaths involving children under the age of 15 occur in a home.^{7,8} This campaign was promoted with the intent that parents or caregivers should ask if there is an unlocked firearm where their children will be playing. There is ample evidence that clinical interventions can be efficacious in preventing

These studies demonstrate that caregivers are willing to discuss firearm safety, but no studies have examined emergency department teams' comfort level and knowledge on these topics.

injuries when they combine an array of health education and behavior change strategies such as counseling, demonstrations, and reinforcement.¹⁰ Prior studies demonstrated that ASK education provided by pediatricians is effective in increasing caregivers' comfort level in asking if there is a gun where their child plays and additionally that caregivers feel that pediatricians should provide ASK education.⁵ The question of whether pediatric teams are comfortable providing firearm education also looks promising, with 87% of pediatric residents believing that it is a "good idea" to ask about guns in a home.⁹ However, there is limited research on the ASK campaign as it relates to emergency medicine teams.

From the results, we found that 91 doctors and nurses participated in the pre-survey and 49 in the post-survey, with the demographics remaining similar and consistent between the two. Additionally, the correct responses to the knowledge-based questions improved from pre- to post-survey (Figures 1, 2). Also, the healthcare teams' confidence in being aware of proper firearm storage to counsel patients increased from 42% to 82%. Post-intervention, 88% of participants felt comfortable discussing firearm safety with caregivers of pediatric patients, demonstrating a significant difference. Finally, the frequency of and comfort with discussing firearm safety did not differ by respondent age, gender, role, or parenthood ($p>0.05$). Thus, this intervention was sufficient to improve knowledge in firearm safety and comfort

in discussing firearm storage with their patients.

Additionally, although this study was performed pre-COVID, some study limitations include that the study was performed at a single, level 1 trauma center in a racially and socioeconomically diverse area. The number of respondents to the follow-up survey (n=49) was substantially less than the primary survey (n=91), which could contribute to selection bias; however, the demographic information from Figure 1 remained overall equivalent, and the total number of firearm owners was 20.9% in the first survey vs 24.5% in the second survey. The fact that clinicians are more comfortable with counseling doesn't preclude the possibility that long-term education of parents regarding the ASK campaign ceases to occur, and it is insufficient to say whether parents are implementing this specific advice from this clinical context. Finally, the

challenge remains of the efficacy of this intervention in the long-term prevention of accidental firearm injuries.

Overall, this short intervention within the ED was sufficient to improve the healthcare teams' knowledge in firearm safety and comfort in discussing firearm storage with their patients. This information was also well-received by participants. This study indicated that the information will lead to increased patient exposure to the ASK campaign and will be an important step in reducing accidental firearm injuries among children. There are still challenges, such as performing longitudinal studies on the long-term effectiveness of such a study in preventing pediatric firearm injuries, particularly in the context of the COVID pandemic as the amount of data strongly skews in favor of those individuals who are available to participate.

Future study directions include replicating the study in the context of

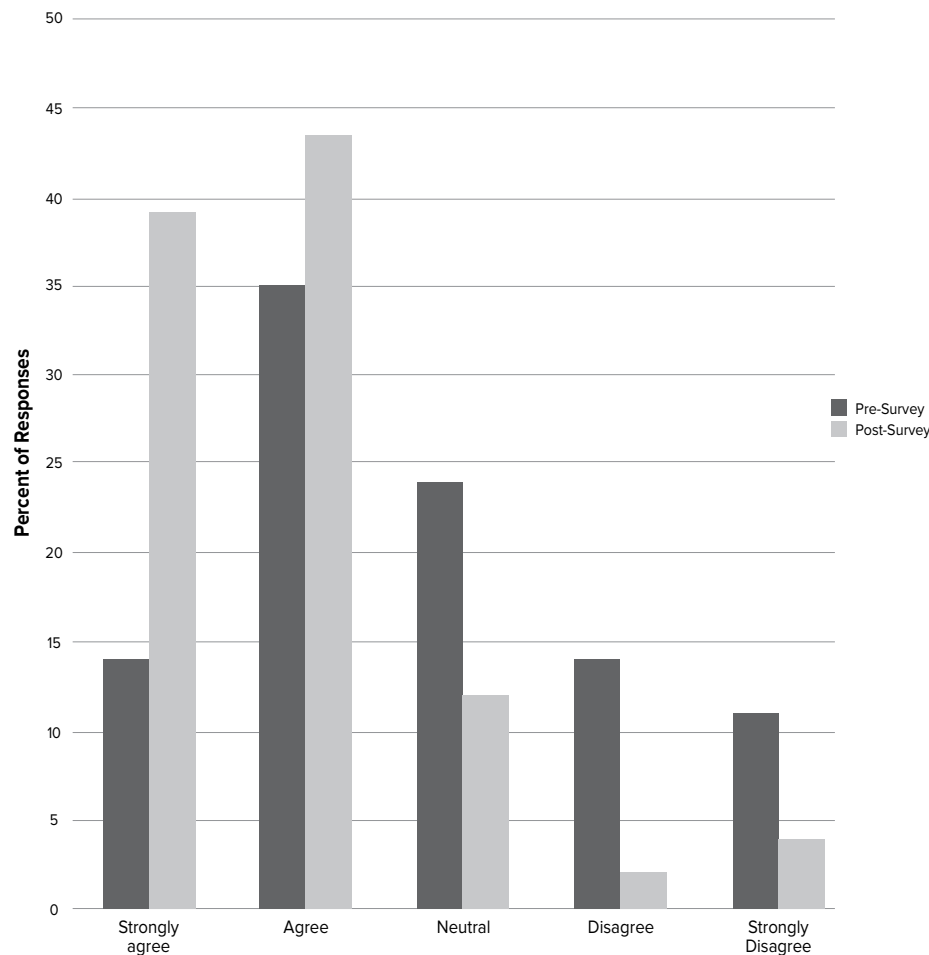
COVID as children are more frequently found at home – making firearm safety even more critical. Involving the newer *Act, Ask, Talk, Learn* from Brady United and completing a follow-up survey several months later to assess if participants feel they have begun to incorporate ASK and firearm safety into their patient care could also be appropriate directions.¹¹ Additionally, it would be valuable to assess accidental pediatric firearm injury pre-and post-intervention to assess efficacy, assess whether pediatric caregivers are following the guidelines provided by the healthcare team, and/or expand this training to other sites in the community.

Conclusion

Unintentional firearm injuries are a significant problem within the pediatric population and many of these incidents could be avoided with proper firearm storage. Exposing EM teams on the front line of patient care in the Emergency Department to the Asking Saves Kids campaign could help disseminate necessary information to firearm owners whose children come into the ED. If this training became widespread, many more caregivers of pediatric patients would receive the information they need to properly store their firearms, and, hopefully, these interventions would be able to help prevent accidental firearm injuries in the pediatric population in future studies. Additional longitudinal research is still required to determine if the use of the Asking Saves Kids educational campaign in the Emergency Department reduces gun injuries amongst children. ★

The purpose of this study was to describe emergency department teams' knowledge and behaviors when it comes to the ASK campaign and firearm safety before and after a brief educational intervention about the ASK campaign.

FIGURE 2. P"I Feel Comfortable Discussing Firearm Safety with Caregivers in the ED



Point-of-Care Echocardiography in the Undifferentiated Patient

A CASE REPORT

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Left ventricular free wall rupture (LVFWR) is a rare and usually fatal complication of myocardial infarction (MI).

Case

A 54-year-old male presented to the ED by EMS after being found unresponsive with GCS of 3 and irregular respirations. Narcan was given in the field with minimal improvement in the patient's status. Upon arrival, respirations were assisted by BVM. Vital signs were HR 155, BP 111/75, RR 8, SpO₂ 100%. The patient was moaning incoherently, exhibiting sporadic movements, and pupils were 3 mm and reactive bilaterally. Naloxone was administered without further effect. While preparations were being made for intubation, an ECG and point-of-care (POC) echocardiogram were performed. Together they raised concern for an inferior wall STEMI with LVFWR evidenced by clotted blood in the pericardial sac and right atrial collapse suggesting cardiac tamponade (Figures 1-5).

Shortly after making the correct diagnosis with POC echocardiography, the patient became significantly bradycardic. Fluid boluses had already been started. Pericardiocentesis was performed with in-line ultrasound guidance as the patient went into cardiac arrest. Though only 10 mL of blood was aspirated, ROSC was achieved after one round of CPR. The patient was stabilized and sent for CTA. The LVFWR was confirmed as contrast extravasation into

the pericardial sac was demonstrated. Cardiology and cardiothoracic surgery were consulted. Unfortunately, the patient expired prior to definitive management.

Discussion

Observational studies estimate that LVFWR complicates between 1% to 4% of acute MIs.¹⁻⁴ Approximately 70% of patients with LVFWR die within minutes.⁵ Few cases present subcutaneously and with enough time for surgical intervention. Survival depends on prompt diagnosis as cardiac tamponade and hemodynamic compromise will often develop within hours.⁶

The typical signs and symptoms of LVFWR include chest pain, syncope, hypotension, and cardiac arrest.⁷ Presentation varies and depends on the rate of blood accumulation in the pericardial sac and the development of cardiac tamponade.⁸

As in this case, EKG can suggest MI as a cause of LVFWR, though the EKG is more often nondiagnostic and does not aid in identifying LVFWR.⁹ Unfortunately, EKG has not been shown to reliably indicate the presence

of pericardial effusion or cardiac tamponade, though low voltage and PR segment depression, and to a lesser extent electrical alternans, can be suggestive.¹⁰ Depending on the time since MI, the ECG may exhibit features suggestive of left ventricular aneurysm (LVA). Specifically, persistent and unchanging ST-segment elevations in the presence of prominent Q waves without reciprocal ST-segment depressions are classic for LVA.^{11,12} Q waves, which were seen in this case, can develop within hours after infarction, but the resolution of reciprocal ST-segment depressions may take up to two weeks.^{11,13}

Fortunately, echocardiography is very sensitive and specific for LVFWR and emergency physicians have demonstrated the ability to diagnose the condition both rapidly and accurately with POC echocardiography.¹⁴ In one study of patients with acute MI, the identification of a pericardial effusion >5 mm was nearly 100% sensitive and nearly 93% specific for LVFWR.⁹ The additional finding of hyperechoic blood

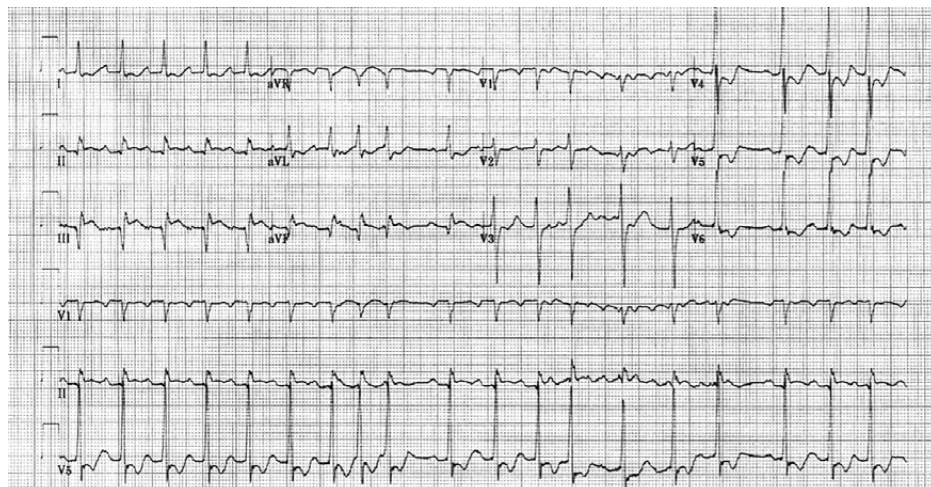


FIGURE 1. ECG demonstrating ST segment elevations in leads II, III, and aVF with reciprocal depressions in leads V4-V6, concerning for inferior wall STEMI.

clots increased specificity to 98%, and if cardiac tamponade was also present, the specificity was greater than 99%.⁹ The specific area of wall rupture does not need to be visualized to clinch the diagnosis but can be more easily identified with doppler or contrast echocardiography.¹⁵

Once LVFWR is recognized, the patient must be quickly stabilized for definitive management. Isotonic fluid boluses should be administered to improve right heart preload.¹⁶ Identification of right atrial collapse during atrial diastole or right ventricular collapse during ventricular diastole should raise

concern for cardiac tamponade and impending hemodynamic collapse. Pericardiocentesis is a life-saving procedure that should not be delayed. The procedure is best performed under ultrasound guidance by identifying the largest pocket nearest the body surface and using in-line needle visualization.¹⁷ Likely, less than 30 cc of blood will be aspirated due to clotting of the blood.¹⁴ Nevertheless, even small volume pericardiocentesis can have profound hemodynamic effects. After stabilization, the definitive management is the repair of the ruptured ventricle by a cardiothoracic surgeon, and operative mortality can be as high as 50%.⁹ ★

TAKE-HOME POINTS

- Point-of-care echocardiography is a valuable tool in undifferentiated patients and can be used to identify unexpected complications of acute myocardial infarction such as left ventricular free wall rupture with high sensitivity and specificity.
- ECG is often not helpful in diagnosing pericardial effusion or cardiac tamponade, though low voltage and PR segment depressions, and to a lesser extent electrical alternans, can be suggestive.
- Pericardiocentesis is a life-saving procedure that emergency physicians need to be familiar with.

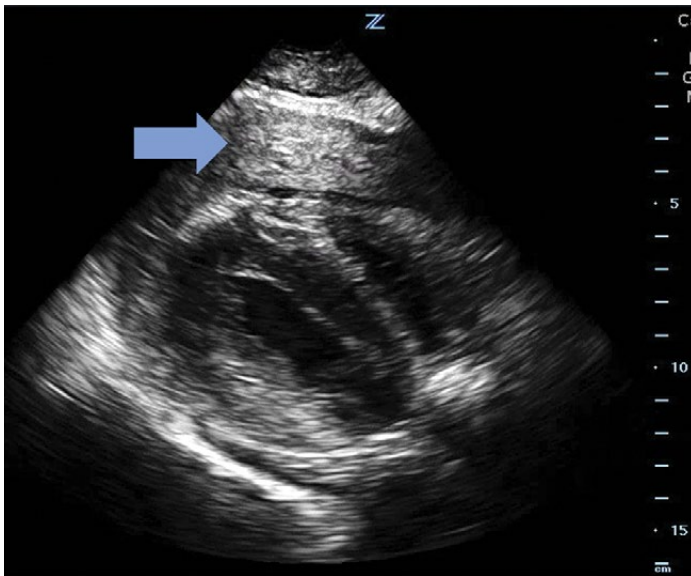


FIGURE 2. Parasternal long axis (PLAX) view demonstrating clotted blood in the pericardial sac.

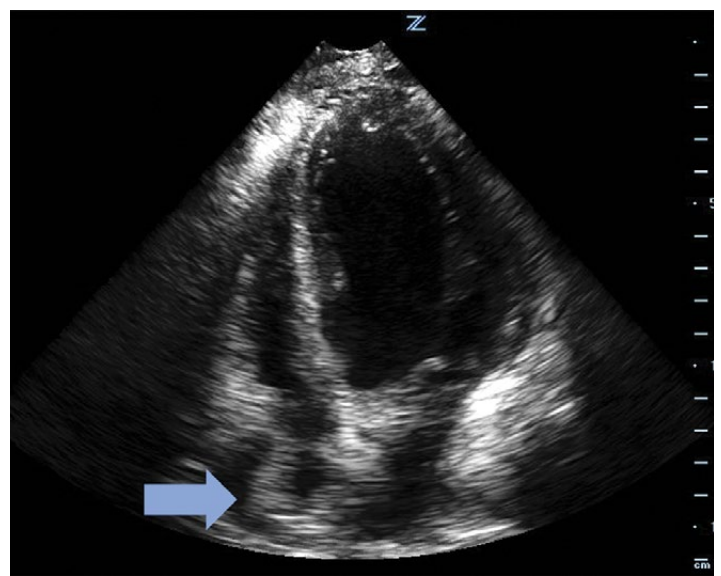


FIGURE 3. Apical four-chamber (A4C) view demonstrating right atrial collapse suggestive of cardiac tamponade.

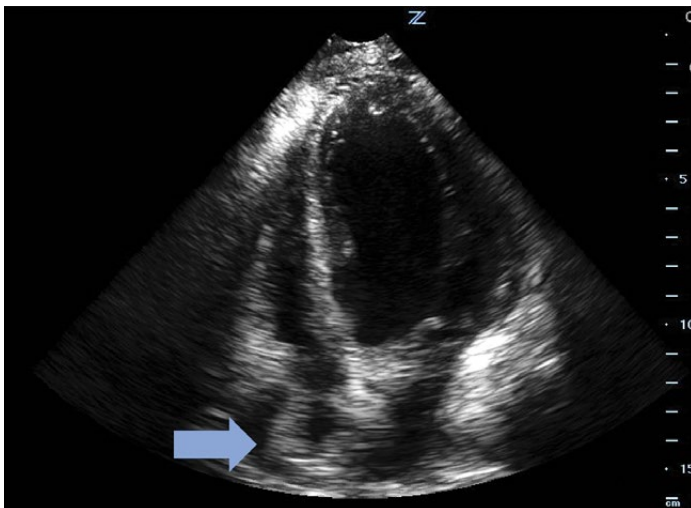


FIGURE 4. Apical two-chamber (A2C) view demonstrating left ventricular inferior wall aneurysm.

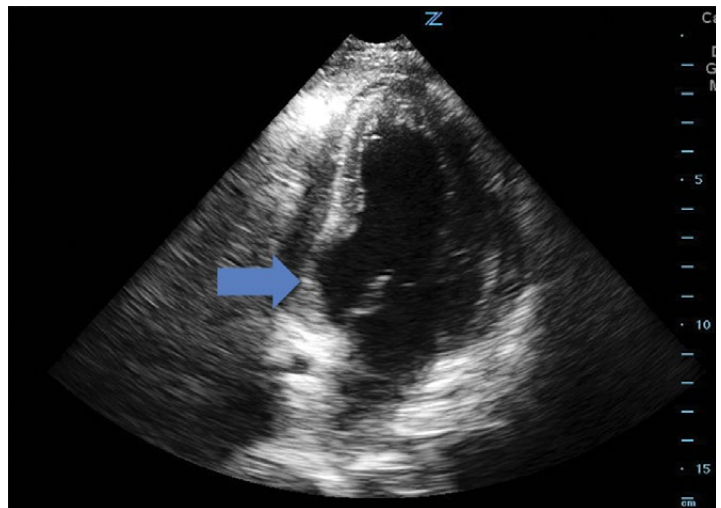


FIGURE 5. Parasternal short axis (PSAX) view demonstrating left ventricular inferior wall aneurysm.

Drug-Induced Erythema Multiforme

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Case

A 24-year-old male presents to the emergency department with complaints of bilateral eye discharge and rash. He states the eye discharge had started unilaterally 10 days prior but then spread to involve both eyes. Six days prior he developed a cough for which he was prescribed azithromycin from a different emergency department, and began his azithromycin this morning. By afternoon he noted a rash on his body starting in the extremities, which rapidly progressed to include his mouth and lips. He has a history of seizures, but has not been on any antiepileptic medications since he was a child. He is unsure if he has had azithromycin in the past. He endorses diarrhea, mild odynophagia, and vague generalized abdominal pain. He denies any emesis or shortness of breath. He admits to smoking marijuana, but no other drug use.

Physical exam illustrates a generally uncomfortable appearing male. Vitals noted tachycardia of 124, temperature of 98.6° F, RR 20, BP 126/84, and oxygen saturation 98% on room air. His eye exam was remarkable for bilateral conjunctival injection with a significant amount of thick white purulent discharge. Fluorescein stain showed no uptake. Oral exam demonstrated hard palate ulcerations, lips with significant erythema and blistering, and a thrush-like appearance of the tongue. Lung exam had diminished breath sounds bilateral, and the patient was continuously coughing up thick white mucus with a partially filled basin next to him. Skin exam demonstrated plaque-like targetoid rash noted over upper and

lower extremities bilaterally, as well as on the lower abdomen. The chest, back, and upper extremities bilaterally also had blistering, large bullae, and sloughing of skin noted. There was no involvement of the palms, soles, or genital region.

Workup in the emergency department included chest xray, EKG, and labs including CMP, CBC, INR, urine, lipase, lactic, and troponin. There were no significant abnormalities noted. Urine drug screen was noted positive for cocaine and THC. Infectious workup was negative for COVID-19, flu, rapid strep, syphilis, and HIV. The patient was admitted with a clinical diagnosis of erythema multiforme.

Pathophysiology

Erythema multiforme (EM) is an acute skin disorder. The typical presentation is a target-like rash. It can also have vesiculobullous lesions. EM can be categorized into two groups: EM minor and EM major. EM minor has the typical target appearing rash; there may be bullae, none to minimal mucosal involvement, and no systemic symptoms. EM major has more extensive rash, mucosal involvement of at least two regions, and possible systemic involvement.^{1,2}

The most common causes, about 90%, are thought to be infectious, with herpes simplex virus (HSV) and



mycoplasma being particularly common. Only a small number of cases are thought to be drug-induced. Other causes include autoimmune, malignancy, and radiation.²

EM was once thought to be on the same spectrum as Stevens-Johnson syndrome (SJS), but is now considered a separate disease state.

Presentation

The rash is often an erythematous targetoid lesion, which begins on the extremities and spreads towards the trunk. It can also involve the soles and palms. The rash is typically not pruritic but can be in some cases. Mucosal involvement can include the mouth, genital region, and eyes. These can present as bullae or erosions which may be painful. Ocular involvement can present with discharge and can lead to conjunctival scarring and vision loss. Systemic symptoms can include malaise, arthralgia, cough, and dyspnea.²

The diagnosis is primarily clinical. Punch biopsy can be used to confirm. Biopsy should be performed in the center of the lesion. This will show keratinocyte

necrosis, lymphocytic infiltrate in the superficial dermis, and epithelial intercellular edema.^{1,2}

Management

Most EM will be self-limited, with resolution anywhere from 2-6 weeks. In patients with EM secondary to HSV, antivirals are typically not utilized in the acute presentation. They can be considered to prevent a recurrence. In EM secondary to medication exposure, the medication should be stopped.^{1,3}

Systemic or topical steroids can be used for skin discomfort as well as oral lesions. Viscous lidocaine may also help with painful oral lesions. For severe oral lesions, patients may be unable to tolerate PO and require parenteral nutrition. Topical steroid drops and lubricants can be used for ocular involvement. An ophthalmologist should always be consulted if there is ocular involvement due to the potential for vision loss.



Disposition depends on case severity. In cases with dehydration due to decreased intake, inadequate pain control, significant systemic involvement, or secondary infection, consider admission. Some patients may require ICU admission and management similar to burn patients. Less involvement can be discharged home and follow up with dermatology outpatient.

Case Conclusion

Through his hospital stay, he was evaluated by infectious disease, dermatology, and ophthalmology.

Further lab work on admission was

negative for HSV, hepatitis panel, blood cultures, and Epstein Barr virus. C-reactive protein was elevated to 123 (ref 0-10). His ANA, cold agglutinin screen, and rheumatoid factor were all negative. His *Mycoplasma pneumoniae* antibody IgG was positive, however his *Mycoplasma pneumoniae* antibody IgM was negative, indicating past exposure but no current infection.

Ophthalmology placed him on oral doxycycline, topical erythromycin, and topical gatifloxacin drops.

Dermatology began him on hydrocortisone 100 mg every 8 hours, plus topical steroids. Skin biopsy illustrated detachment of the epidermis from the underlying dermis, full-thickness necrosis of the epidermis, and mild perivascular superficial lymphohistiocytic infiltrate. All of which are seen in EM. The presentation of acral to central spread of rash and generally nontoxic appearance of the patient supported EM over SJS.

He had clinical improvement while in the hospital. He completed a 7-day course of oral doxycycline and erythromycin eye drops. He was discharged on topical steroids, gatifloxacin eye drops, prednisolone eye drops, and a 2-week course of oral prednisone. His discharge diagnosis was EM with mucocutaneous involvement.



In this patient, many causes of EM were considered. He was negative for many viral and bacterial sources of infection. Autoimmune workup was also normal. He did have the recent use of a macrolide antibiotic. He also admitted to frequent nasal insufflation of cocaine after the results of his urine drug screen came back positive. There have been several case reports where azithromycin has been implicated in both EM and SJS.^{4,5} However, there is also a consideration of a contaminant in his cocaine resulting in his symptoms. ★



Case of Doxepin Overdose

Massud Atta, MD

HCA Healthcare, Coliseum Medical Centers

Sanam Patel, MD

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Jon Shivdat, DO

HCA Healthcare, Coliseum Medical Centers

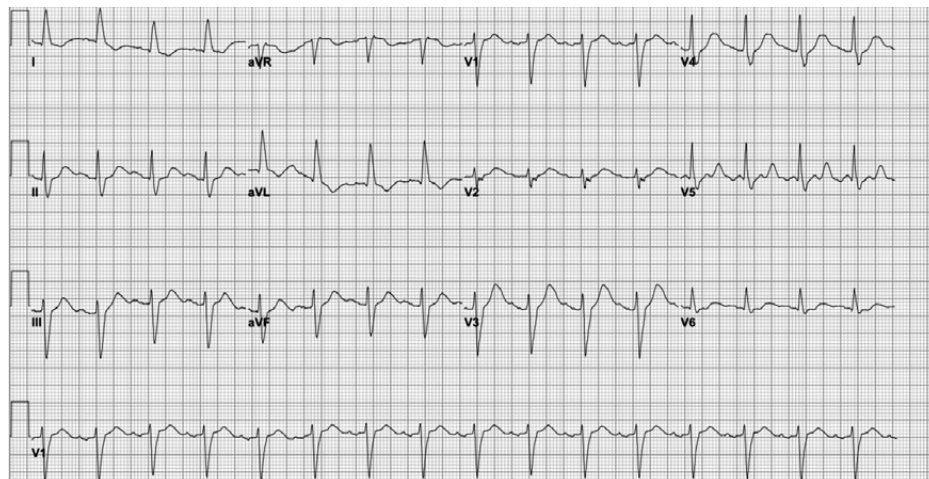
Pete Stueve, DO

HCA Healthcare, Coliseum Medical Centers

Even with the introduction of selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCA) are still utilized in the treatment of major depressive disorders and chronic pain syndromes.¹⁰ Tricyclic antidepressants (TCA) inhibit presynaptic reuptake of norepinephrine and serotonin in the central nervous system (CNS). They are known to block different types of receptors such as peripheral alpha-adrenergic, histaminic, muscarinic, and central serotonin receptors which lead to various effects on the individual.¹¹ Four pharmacological properties are primarily recognized for causing the toxic effects of TCAs: inhibition of norepinephrine reuptake at nerve terminals, direct alpha-adrenergic block, cardiac sodium and potassium channel blockade, and anticholinergic action.¹² In comparison to an SSRI overdose, TCA overdoses are the cause of a higher rate of fatality and hospitalization in the United States.¹⁰ Doxepin is a tricyclic antidepressant that was primarily approved for depression but has also been approved by the Food and Drug Administration (FDA) to treat insomnia and anxiety.

Case

A 70-year-old male with a past medical history of major depressive disorder, gastritis, hypertension, atrial fibrillation, and recent cerebrovascular accident (CVA) with residual right eye peripheral vision loss was transported by emergency medical services (EMS) as he was unresponsive and had an altered mental status. Per EMS, there were two empty bottles of doxepin at the scene. Patient was recently released from the inpatient psychiatric facility after being admitted for reports of suicidal ideations. Patient had a laryngeal mask airway (LMA) placed by EMS at



The initial EKG at arrival showed a normal sinus rhythm, ventricular rate of 96, QRS interval widening with duration 132 ms, and QTc interval widening at 548 ms. There is a nonspecific intraventricular conduction block present. When compared to a baseline EKG done one week ago, the ventricular rate had increased by 30, prolonged QRS and QT intervals.

the scene, and the primary sources of history at the hospital were EMS and the patient's nephew.

In the ED, the patient was managed systematically with priority to airway, breathing and circulation. Initial vital signs were BP 135/60, HR 101, RR 18, and O₂ saturation 100% on vent FiO₂ 100%. Patient's GCS was 3 upon arrival at the ED. EKG showed normal sinus rhythm with QRS widening at 132 msec and QT interval at 434 msec.

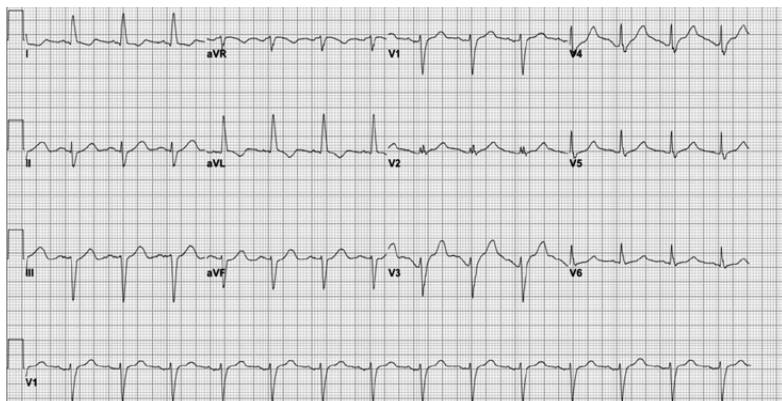
Treatment

The patient's airway, breathing and circulation were addressed once he arrived, and an EKG was ordered immediately. The patient had a LMA placed in the field for airway protection, and this was later replaced with a definitive endotracheal tube under video laryngoscopy. Patient was sedated with etomidate and paralyzed with rocuronium. Tube placement was confirmed, and the patient had bilateral breath sounds. Next, a triple lumen venous catheter was inserted in the right internal jugular vein for medication administration and fluid resuscitation. Given the patient's presentation and history concerning doxepin overdose, multiple steps were taken to prepare

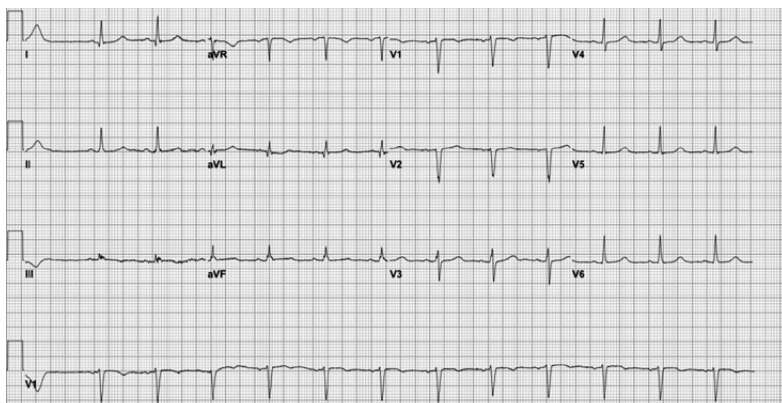
for management and treatment of the TCA overdose. During intubation, an Orogastric tube was placed, and the patient received 100g of activated charcoal. Sodium bicarbonate was ordered from the pharmacy, and a bicarbonate drip and norepinephrine were also ordered at bedside. For QRS >100msec, bolus was ordered at 1-2mEq/kg. This bolus can be repeated every 3-5 minutes until QRS <100msec. Infusion rate is 200cc/hr of 150mEq NaHCO₃ in D₅W. It's recommended that these patient's electrolytes and pH be monitored every 1 hour. Goal is to QRS that remains <100 msec and pH 7.45-7.55. QRS intervals should narrow within 60 seconds of sodium bicarb administration. Poison control was notified of the case, and they recommended treatment until the QRS interval became normal and to start a bicarbonate drip.

Outcome and Follow-Up

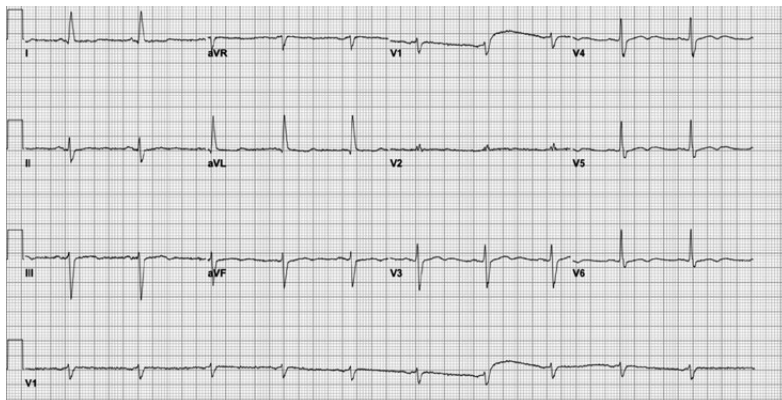
The patient was stabilized and transferred to the intensive care unit for further treatment and management. Patient was extubated the next day in the ICU and transferred to the floor for one day. The hospitalist team consulted psychiatry, and the patient was admitted



EKG done 20 minutes later showed normal sinus rhythm, ventricular rate of 78, decreased QRS interval of 88 ms, and decreased QTc interval of 476 ms. There was no longer a nonspecific intraventricular conduction block.



An EKG done 2 hours after arrival showed a normal sinus rhythm, ventricular rate of 87, prolonged QRS interval of 112 ms, and still prolonged QTc interval of 575 ms.



An EKG done the next day, about 24 hours after patient arrived to the emergency department, showed a normal sinus rhythm, ventricular rate of 63, QRS interval of 104 ms, and QTc interval of 462 ms. This EKG is similar to the one the patient had a week prior. All EKG abnormalities had resolved at this point.

DISCLAIMER

This research was supported (in whole or part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this presentation represent those of the author and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

Special Acknowledgement and thank you to Yash Patel MSII, Mercer University School of Medicine for his contribution.

to an inpatient psychiatric facility for suspected suicide attempt with doxepin.

Discussion

We present a case of suicide attempt by doxepin overdose in an elderly male patient with history of depression and recent CVA. Doxepin was first approved for use in the United States in 1969. The EKG is a highly utilized and important tool for emergency medicine physicians to diagnose many medical conditions including TCA overdose. There are many EKG abnormalities present with a TCA overdose.⁶ Some of the most common EKG findings for a TCA overdose include:

- Sinus tachycardia (most common EKG finding)
- Widening of the QRS greater than 100 msec
- Prolongation of the PR or QT interval
- Right bundle branch block
- Non-specific intraventricular conduction delay (IVCD)
- Wide-complex tachycardia
- Ventricular tachycardia/ventricular fibrillation
- Brugada pattern

QRS duration of >100msec increases the risk of seizures, and a QRS >160msec increases the likelihood of ventricular dysrhythmia.⁷ The QRS prolongation is not specific to TCA overdose but rather indicative of a sodium channel blockage.⁸ Other medications that block sodium channels include propranolol, carbamazepine, bupivacaine, and antiarrhythmics like quinidine, flecainide and procainamide.⁹

Another important aspect of this case is the history of both a CVA and depression. The relationship between stroke and depression has only recently been investigated, but it is estimated that depression affects about one-third of stroke survivors. Additionally, depression is also associated with poor functional outcomes for patients with recent stroke, poor quality of life, increased recurrent infarcts, and increased mortality.¹⁴ Currently, there insufficient guidance on the screening and treatment of depression in this high-risk population. Thus, future research on appropriate screening tools and interventions may reduce the rates of depression in this population.

In conclusion, our case highlights the EKG changes associated with doxepin overdose, particularly QRS widening and QT interval prolongation. We also demonstrated the systematic approach emergency physicians must take in caring for patients with doxepin overdose, which includes focus on airway, breathing and circulation followed by obtaining an EKG as soon as possible. The treatment included sodium bicarbonate bolus followed by a sodium bicarbonate drip. Once the QRS interval had become normal, the patient was monitored in the ICU for 24 hours. Lastly, this case brings to light the need for improved mental health care in this country possibly to prevent similar cases in the future. ★

TACTICAL MEDICINE Q-AND-A

Life as a SWAT Doc

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“*Shots fired! Officer down! Officer down!*” Those words send shivers down the spine of every first responder and medical professional.

Active shooter. Inside: A man has barricaded himself after shooting family members and calling 911. The initial responding police units walked into a trap, and now 2 officers face life-threatening injuries. The shooter is still an active threat somewhere in the building. SWAT is activated, but they are bringing an important asset with them, an emergency physician. Not a typical day in the ED.

Lives are at stake. Waiting for the scene to be secured effectively so that prehospital professionals can treat the officers will decrease the chance of their survival. Tactical EMS has been rapidly growing around the country for specifically these types of situations, but in a few select places, the practice of physicians performing emergency medicine in tactical environments has also taken hold. In fact, tactical EM has emerged as an evolving subspecialty, allowing physicians to potentially render medical care in high-threat environments, where most civilian EMS and fire crews cannot safely respond. Taking shape as a civilian equivalent to the military’s battlefield medicine and special operations medicine, the slogan that captures tactical EM is “doing the best medicine in the worst places.” Tactical emergency physicians are able to support a wide variety of teams with no one single standard. Some

examples include working with Special Weapons And Tactics (SWAT), federal law enforcement teams, wilderness and waterborne extraction teams, HAZMAT, and Search and Rescue (SAR) squads. The need for medical personnel in these high-risk situations is also clear, as most officers and federal agents are not usually required to undergo medical training and tactical EMS specialists are few and far between. Furthermore, the combination of volume (with > 50,000 yearly SWAT deployments in the U.S. alone) and tactical environments that are not optimized for medical care, the need for well-trained physician-led tactical medical teams is clear. To hear from the experts in this field, we bring you Drs. Jeremy Ackerman and Ross Berkeley, who discuss their experiences as tactical emergency physicians..

Jeremy D. Ackerman, MD, PhD, FACEP

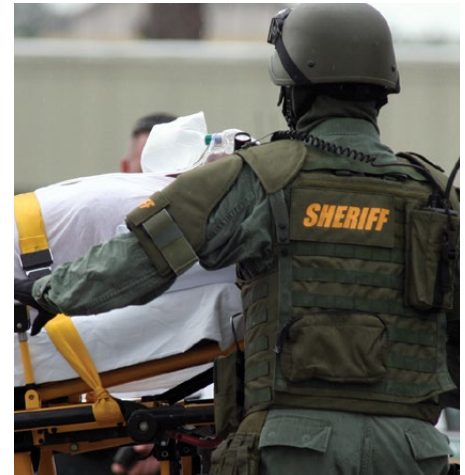
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How would you define tactical emergency medicine and what is your current role in it?

Dr. Ackerman: “So I gravitate to the definition that the National Tactical Officers Association uses which says tactical medicine covers medical care in the planning and execution of tactical missions, including extended operations and extreme environments, as well as shorter operations. So something which may be a little different from my EMS-



trained colleagues is that I’m more interested in care in the field or care under fire, unlike those who prefer to not usually put on body armor and sit in an armored vehicle, but to supervise operations as medical director.”

Dr. Berkeley: “I have served as a tactical physician for the Las Vegas Metropolitan Police Department (LVMPD) SWAT team since 2005, which typically involves on-scene medical support during team deployments to high-risk warrants and barricades. In non-military settings, tactical medicine is a specialized field involving the provision of pre-hospital medical oversight and support for law enforcement personnel, as well as bystanders, in scenarios in which civilian EMS personnel cannot respond, often due to scene safety concerns. The LVMPD tactical physicians are involved in the initial mission briefing with the SWAT team, which includes a review of the schematic layout of the target location and the tactical plan. During each scene response, the physician and a tactical medic, who is also an officer with LVMPD’s Search & Rescue, are deployed in a tactical rescue vehicle. The physicians wear body armor and are on-scene as the SWAT team clears the building, either dynamically (rapid breach entry) or tactically (slow and

methodical). The tactical physicians are tasked to stabilize individuals on-scene with an injury or acute medical condition, utilizing the principles of Tactical Combat Casualty Care (TCCC), with prioritization depending on the level of injury and the tactical situation.”

Could you describe your path and inspiration in getting involved in tactical EM?

Dr. Ackerman: “In addition to my role as an emergency physician, I am a biomedical engineer. I also teach at Georgia Tech how to design medical devices, and, more broadly, innovation and problem-solving in medical and healthcare spaces. I literally did not know that tactical medicine was what I wanted to do until I accidentally stumbled upon it. And as I was getting pulled into tactical medicine, with not much prior knowledge in it, I started to realize I would need to develop a similar skill set as my officers. Meaning if I am going to sign off on a set of orders, I need to understand the environment you’re going to use it in, which is what led me to realize my knowledge limitations and ultimately pursue police academy training. When I realized my team wanted me to deploy with them, it became kind of essential for a medical doctor like me to almost have the same level of training going into the field. One of the moments which made me go to the police academy, was when we had our active shooter drills in preparation for Super Bowl events, where we basically would run towards the threat. It is a little bit of oversimplification, but when we are there as a SWAT team we are there to figure out what the threat is, where it is and stop ‘em. Often the fastest way to do that is run towards the sounds of the gunshots. To do that you have to be able to function as a tactical officer as well as a healthcare provider.”

Dr. Berkeley: “My residency training at the University of Pittsburgh included participation in a unique program involving on-scene response via a resident EMS response vehicle, in order to provide medical direction and hands-on stabilizing prehospital care for patients with critical illness, such as cardiac arrests and major

traumas. The experience highlighted the unique nature of the provision of medical care by physicians in the prehospital setting, and I was seeking similar opportunities when I moved to Las Vegas. Fortunately, my mentor was actively involved with the LVMPD Tactical Medical Program, and I applied for a position as a tactical physician once a spot opened up on the team.”

What is an average working week/month in your life as a tactical EM physician? How many hours dedicated to tactical work, including training, going on calls, maintaining skills, etc, do you have per week/month?

Dr. Ackerman: “The short answer is no, so we don’t have a standardized schedule for every week. Other than our training days once every 2 weeks, our schedule is given a couple of days in advance based on upcoming operations by our tactical unit. Some operations come together with no advanced warning.

Dr. Berkeley: “In addition to 7 LVMPD Search & Rescue officers with EMS training (2 paramedics and 5 AEMTs), our team consists of 10 physician volunteers and 4 civilian paramedic volunteers. We take calls each month to cover 12- and 24-hour shifts, and coordinate based on our primary work schedules. Typically, I cover 48-60 hours of call each month, in addition to 4 hours of monthly training, which may involve simulated downed-officer and multiple casualty scenarios, procedural skills labs, and a variety of other training exercises.”

How do you balance your work life between being an academic or community EM physician and tactical work? Do you get dedicated time off to pursue other stuff such as these?

Dr. Ackerman: “So it does take a bit of creativity and being a glutton for punishment to move your schedule around to fit your field training days and adjust your schedule ahead of time-based on operations announced by your tactical unit. Academic EM helps in that as money from contracts can reduce clinical time.”

Dr. Berkeley: “This is a volunteer role which is incredibly fulfilling and enjoyable, and never feels like ‘work’ to me. To the contrary, I feel that my role as a tactical physician is an opportunity to serve the community, and helps provide me with an increased sense of balance in life.”

As a board-certified/residency-trained physician, what are the job prospects for those interested in tactical EM? What types of roles can a physician possibly perform or be hired for in this field?

Dr. Ackerman: [No Response]

Dr. Berkeley: “It may not be realistic to view working as a tactical physician as a ‘job prospect’ – generally, most of these positions are voluntary without any compensation. A physician serving in an administrative role as a medical director for a tactical medical program may potentially receive some compensation, but the stipend would not likely suffice as a primary job. A role like this is not about money, it’s about the opportunity to serve and help make a positive impact.”

Are there other additional unique aspects of tactical EM that EM physicians do not normally have to worry about?

Dr. Ackerman: “Anytime I tell people that I go out with SWAT teams, that I went through the police academy, and I’m in an environment where I feel it is most appropriate for me to be armed, I get asked frequently, “You’re armed, how can you shoot people?” It comes back to “do no harm”. The biggest threat to my patient, my officer or the civilian who is injured, is the person who already shot them once. In my view, the Hippocratic Oath is problematic in modern healthcare but is sort of the biggest single barrier to the role I have taken up in tactical medicine. Our whole job as physicians is to navigate the issue of how to provide the most benefit with the least risk of harm and balance that with the patient’s wants, needs and wishes. When we were on station at events related to the Super Bowl, the reality was that the possibility of a large-scale attack, active

shooter or bomb was extremely rare and unlikely. But if you're going to be in that environment and poised to be able to provide help, you also need to do the first thing that mitigates that threat to other people including the officers, which is to eliminate the threat. It's an approach developed in the military that is highly applicable in the law enforcement tactical environment too."

Dr. Berkeley: "Any time medical care is being provided outside of the controlled environment of the hospital, particularly during SWAT team operations, scene safety is a key element that needs to be considered. One example I previously would not have considered is that the use of a laryngoscope to intubate during nighttime operations creates a visible light source that could potentially make the tactical clinician a target for an armed suspect. A phrase that some may have heard is that 'good medicine can sometimes be bad tactics....' There is an initial learning curve to adjusting hospital-based skills to the tactical environment. Equipment and medication limitations also create unique challenges in the provision of care under potentially austere conditions."

Do you have any advice for medical students and residents interested in pursuing a career in tactical EM?

Dr. Ackerman: "So I think for medical students and residents, the most straightforward way would be to pursue an EMS fellowship and look for a place, like Hopkins or UT San Antonio where there is a focus on tactical medicine, in their EMS fellowship. Make sure wherever you're going there are opportunities to actually work with tactical teams. Agencies who need a physician often will go to the training programs they know about when they have a need. I think the path I have taken to essentially find a connection with an agency first, without prior training or experience, is still possible, but there are a lot of things that can make it a bit challenging. It requires a bit of luck to find the right agency, with officers in leadership that see the value in working with clinicians and that

have the resources and the patience to provide some of the training. I think for folks coming out of the military, it becomes easier to get buy-in from tactical units."

Dr. Berkeley: "First, I would encourage anyone with an interest in tactical medicine to pursue their passions. Since medical students and residents are still in training, I suspect that opportunities to serve as a tactical clinician involved in unsupervised patient care may be rather limited — that will likely vary depending on the design and nature of the particular tactical medical program, state licensing laws, and school/residency policies and procedures. One great way to get involved may be to consider volunteering with the local tactical medical team to serve as a 'victim' for training scenarios — that may lead to additional opportunities along with the chance to network with others who have a shared interest. I have had some emergency medicine residents, and even a medical student, attend our monthly tactical medical training, and some have accompanied me on scene responses. Those with a significant passion could also consider attending a tactical medicine course, such as the one offered by the International School of Tactical Medicine."

For the residents and medical students, in particular for those without prior tactical exposure, how would you recommend getting involved/get started?

Dr. Ackerman: "Like a lot of things in life, you have to be prepared and show up. My opening came from another project which led me to start talking to police officers. That led to introductions to SWAT members, then invitations to observe training, then invitations to participate in training, and finally invitations to assist with operations. I did some reading and training on my own so that I would be ready to learn and perform. Many departments offer short "Citizen's Academy" which may be a way to meet some officers and department leadership while simultaneously learning about police operations. Talk to tactical physicians to

make sure you understand what you can offer to a team and find out if they can help make introductions."

Dr. Berkeley: "In addition to the above suggestions, I would recommend seeking out a mentor early for personalized guidance. Tactical medical programs vary widely based on the particular agency, city, and state — the specific role of the physician on the team (including whether or not they are armed) and even potential expectations for physician training as a law enforcement officer, are unique to each program."

The field of EMS as a subspecialty of EM is well established, however, tactical EM seems to exist as quite a specific niche. In order to get the best professional exposure/training possible, would you recommend that the interested residents pursue a specific Tactical Medicine fellowship (such as the one offered by Johns Hopkins/San Antonio), seek an EMS fellowship, or choose an entirely different path?

Dr. Ackerman: "I think fellowships with a tactical component are a good start and even an EMS fellowship without a specific tactical experience probably helps. Some of the people I know who are in tactical EMS have never put on body armor, have never handled or fired a gun! Most tactical medicine is identical to EMS — it is the supervision of emergency medical providers in the field. If you are interested in tactical EM, I would highly recommend pursuing an EMS fellowship. Would it be better to do one with a tactical focus — probably, but I don't think it's essential. Not doing an EMS fellowship is possible but you have to remember that there is a lot you will have to learn on your own."

Dr. Berkeley: "The pursuit of fellowship training is a very personal decision. For someone with a significant passion for tactical medicine and aspirations to serve in a leadership/administrative role, the additional training may align with their personal and professional goals and be valuable to their development. However, completion of a fellowship is not necessary for the vast

majority of emergency physicians (myself included) who choose to serve as tactical physicians. I felt well-prepared for many aspects of the role when I first started and rapidly learned the finer points of tactical medicine via the monthly training, in addition to completing SWAT school with the LVMPD. My fellow volunteers on the LVMPD Tactical Medical Team include physicians from multiple other specialties, including trauma surgery, anesthesiology, and neurosurgery.”

Given the current social and political climate regarding law enforcement, what are your thoughts on the future of tactical medicine in general and specifically for physicians?

Dr. Ackerman: “I think in healthcare, there is a pretty big need to have us understand policing and how it works. I also think in healthcare, we have a big opportunity to help guide and possibly lead some of these discussions on policing. I think we (in healthcare) have a good

platform to try to get society to address what I would argue as the ‘bigger picture’ problems. But it is a bit of a problem when in healthcare we don’t understand how policing works or many of the current laws. I think there is a developing role for tactical physicians to address this. I think the opportunities for physicians to work with law enforcement will continue to be out there. I do worry a little bit that as physicians, we have a risk of getting stuck in the cross-hairs of investigations into law enforcement. There are a few cases where physicians have used firearms which has led them to lose their medical license. That is something I genuinely worry about, amplified by the recent events. Unfortunately, with increased numbers of mass casualty events resulting from violence, there appears to be an increasing need for tactical medicine. Tactical physicians are needed to support teams and potentially aid in the medical response to these events.

Dr. Berkeley: “Emergency medicine physicians are accustomed to working

collaboratively with many other specialties, as well as with EMS and law enforcement personnel, as key elements in the mission to serve as the safety net for the community. Embedding a tactical physician into a law enforcement team creates a unique opportunity to provide advanced medical care to both suspects and bystanders in situations in which it may not be possible for EMS personnel to respond. Since law enforcement personnel may also be the first to arrive on-scene and encounter patients with significant medical issues and/or traumatic injuries, tactical physicians also have an opportunity to further serve the community as a whole by educating our police colleagues on basic lifesaving and the Stop the Bleed campaign. I think there will continue to be a need for tactical physicians in the years to come.” ★

Acknowledgment: We would like to use this opportunity to thank Drs. Ackerman and Berkeley for their time and effort in making this article possible.

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Over the past 30 years, emergency care (EC) has rapidly developed in many places around the globe.¹ As of May 2019, 82 countries recognize emergency medicine as a distinct specialty, and there are more than 80 EC-related journals worldwide.^{2,3} This growth stemmed from the recognition that conditions amenable to EC, such as trauma, cardiovascular disease, and strokes, are substantial contributors to global mortality (50.7%), as well as an increased understanding of EC's capacity to reduce overall morbidity and mortality and promote the delivery of safe, efficient, and effective care.^{4,5} The World Health Organization spurred EC development through calls for comprehensive emergency health care systems that seamlessly integrate prehospital care with stabilization, triage, immediate care, and in-hospital care.⁶

However, advancing EC is a tall task, often complicated by social, political, and economic factors. Therefore, emergency physicians eager to educate, research, and develop EC globally in conjunction with local partners are needed. ACEP's International Ambassador Program seeks to do just that through collaborative efforts of teams consisting of U.S. and internationally-based emergency physicians. Currently, Ambassador teams are engaged in the development of EC in 79 countries. Medical students from the Global Emergency Medicine Student Leadership Program sat down with 18 of ACEP's International Ambassador teams to capture their perspectives on the state of EC development in the countries where they work.

	Flag	Countries	EM as a Recognized Specialty	Year of EM Development	EM Professional Societies	Location Distribution of EM Physicians	Pre-Hospital/EMS System	Residency-level EM Training	# of EM Training Programs	EM Subspecialty Fellowship Training
AFRICA		Egypt	✓	1978		80% big city 20% small town			6	
		Ethiopia	✓	2010		80% big city 15% small town 10% rural area			2	
		Rwanda	✓	2011		100% big city			1	
		Uganda	✗	2007		100% big city			2	
AMERICA		Bolivia	✗	2018					0	
		Ecuador	✓	1987		80% big city 20% small town			2	
		Honduras	✗	2017		100% big city			0	
		Jamaica	✓	1988					1	
		Mexico	✓	1980's		60% big city 30% small town 10% rural area			100	
ASIA		India	✓	1999		60% big city 35% small town 10% rural area			550	
		Philippines	✓	1988						
		Sri Lanka	✓	2004					1	
		Thailand	✓	2001		60% big city 30% small town 10% rural area				
EUROPE		Germany	✓	2018		100% big city			0	
		Italy	✓	1998		90% big city 10% small town			25	
		Russia	✓	2010		100% big city			2	
		Turkey	✓	1990		80% big city 20% small town			99	
OCEANIA		New Zealand	✓	1970's		40% big city 40% small town 20% rural area			18	

AFRICA

Egypt

Student Interviewer: Rebecca Leff

Ambassador Team Interviewee(s): Dr. Jon M. Hirshon
(ACEP Lead Ambassador), Dr. Walid Hammad
(ACEP Deputy Ambassador)

“[When considering emergency medicine capacity building in the setting of a LMIC like Egypt] don’t go for the bells and whistles and all the newest gadgets, go for what is most important from a population-based perspective... Our global partners know what they need. Our job as global health practitioners is to support them.”

Exciting Development

The most encouraging advancements are the development of the specialty and solidification of the foundational proficiencies of EM. For example, the success of the Sequential Trauma Emergency/Education Programs course, created through a collaborative effort of the University of Maryland and Egyptian physicians, has been demonstrated by over 1000 physicians being trained in trauma care and by the program’s perpetuation after transitioning to in-country trainers and direction.

Biggest Challenge

While the number of physicians trained in EM has significantly increased over the past decade, “brain drain” has taken a significant toll on the expansion of EM in the country, as newly trained EM physicians emigrate to practice in other, more lucrative settings.

Ethiopia

Student Interviewer: Rio Beardsley

Ambassador Team Interviewee(s): Dr. Getaw Hassen
(ACEP Lead Ambassador)

“It’s all about the lack of resources — we’re developing the international [academic] connections, we have the students, but it’s all limited because it’s hard to even get a CT scan in most places.”

Biggest Challenge

Resource shortages, specifically the lack of medication and equipment are two of the biggest barriers to improving emergency care in the country.

Ambassador Team’s Work

A current research project is investigating the use of ultrasound to measure optic sheath diameter as a surrogate measure for outcome severity in traumatic brain injuries.

Rwanda

Student Interviewer: Natalie Jansen

Ambassador Team Interviewee(s): Dr. Adam Levine
(ACEP Lead Ambassador)

“In the U.S. sometimes we don’t have access to a medication or a tool that we’re used to using — and we sort of shut down. One thing you learn in resource-limited settings is that you can continue practicing. You can continue working. No matter

what is gone you can just figure out a way to do whatever you can that’s best with the resources you have.”

Exciting Development

There are now fully trained Rwandan EM faculty who are running the EM training program and the ED. Additionally, a government policy change to waive a two-year service requirement if pursuing EM has helped facilitate additional interest and demonstrates that EM is a priority.

Biggest Challenge

The biggest challenge is access to resources, both financial and human. Investment in medical trainees takes years and once they’ve been trained there is the additional challenge of finding money to pay their salaries and keep them in the country. “There are going to be limitations in supplies, equipment, and facilities...but, I think the limitations of human resources are by far the most important because you can have a fancy new EKG machine, but if no one knows how to read an EKG, it’s not going to be very useful.”

Uganda

Student Interviewer: Kelley Gorsuch

Ambassador Team Interviewee(s): Dr. Stacey Chamberlain
(ACEP Lead Ambassador)

“I tend to focus in my clinical practice on clinical reasoning... and minimizing clinical tests. Working and observing in an environment where there [are] extremely limited diagnostic tests... you see where there can be a balance”.

Exciting Development

Mbarara University of Science and Technology is celebrating the recent graduation of their first class of EM residents from its two-year master’s program. The inaugural class of five graduates comes at a crucial time during the growth of emergency care in the country.

Biggest Challenge

“...It is exciting that 5 or 6 people have just graduated... it is still not going to be enough for the whole country.” The biggest challenge remains the access to care in rural areas. “...There will still be a large gap in care for rural areas (~80% of the population) even with this exciting advancement.”

AMERICAS

Bolivia

Student Interviewer: Ricki Sheldon

Ambassador Team Interviewee(s): Dr. Autumn Brogan
(ACEP Lead Ambassador), Dr. Ashley Jacobsen
(ACEP Resident Representative)

Exciting Development

The first International Congress for Emergency, Trauma and Disaster Medicine (*Primer Congreso Internacional de Medicina de Emergencias Trauma y Desastre*) was planned for March 2020 but was postponed due to COVID. These well-publicized meetings with the involvement of international EM organizations and physicians will help promote EM for national recognition as a specialty.

Biggest Challenge

Hospital systems need to publish research in the field of EM in order to gain credibility for the specialty. Once an institution produces a number of publications, the government can consider its ability to create an EM residency.

Ecuador

Student Interviewer: Halley Alberts

Ambassador Team Interviewee(s): Dr. Augusto Maldonado
(ACEP Liaison)

“Just like all the countries in the world, the role of the initial responders and the organization of emergency services in the face of this health emergency [COVID-19] has been very special. I believe that to the authorities, it is now very clear the importance of emergency medicine as a specialty to face this type of complex situation”

Exciting Development

Sociedad Ecuatoriana de Medicina de Emergencias, has increased in number by over 500%! The society has been very active at the national level to define treatment protocols for COVID patients and establish national policies. The society has also shown initiative in exploring specific areas of EM, such as pediatric emergency care.

Biggest Challenge

There are large disparities, between private and public healthcare sectors and between rural and urban areas such as shortages in medical supplies, long wait-times, and crowding. Additionally, the economic situation has limited innovation. Many in EM are having to work two to three jobs to have a sufficient income to live, leaving little time for research, teaching, or collaboration.

Honduras

Student Interviewer: Francesca Brancati

Ambassador Team Interviewee(s): Dr. Rosa Tercero
(ACEP Liaison)

Exciting Development

The National Emergency System (SNE) was established in 2017. This law created a ‘911’ phone number for any type of emergency and instituted ambulances to provide pre-hospital care and inter-facility transport. Prior to this, citizens had to be brought to the nearest hospital by family members, cab, or police car. There are now 52 ambulances in Honduras located in seven major cities. These ambulances are staffed by first responders who undergo a year of medical training, including basic life support, and are the equivalent of an EMT-intermediate.

Biggest Challenge

Developing a “consciousness in the medical community” for the specialty of EM has been a challenge. EDs in Honduras are currently operated by general practitioners or specialists, with no real triage system in place. Creating an EM specialty would require integrating EM physicians with the current structure and “introducing the philosophy of EM” to medical practice, which requires gaining the support of hospital systems and physicians.

Jamaica

Student Interviewer: Ololade Akinfemiwa

Ambassador Team Interviewee(s): Dr. Vanessa Cousins
(ACEP Deputy Ambassador)

“[You learn] how to make do with what you have. How to best utilize your resources. I remember once I was trying to get an ultrasound. I was so used to being able to get an ultrasound and putting an IV in. I had to use a transvaginal probe at one point, to put in an IV, which was interesting...”

Biggest Challenge

The greatest challenge is limited resources and staff. “It is a mix between physicians and nurses. They have good nursing staff, but they are still really limited. More so the resources, though. The facility, the equipment, and the medicine themselves.”

The Ambassador Team’s Work

One goal is to “develop some resources, such as handouts that we can send that they can give to their residents. For example, a quick handout about something pharmaceutical that is helpful clinically.” Another “is to figure out how to get ACLS done with limited funding and resources. It is a little more challenging, but I think once we can get some things virtually set up, I think that will be a great way to help in terms of developing those handouts or whatever it is that we use for education.”

Mexico

Student Interviewer: Nathan Bode

Ambassador Team Interviewee(s): Dr. Haywood Hall
(ACEP Lead Ambassador), Dr. Jorge Garcia (ACEP Liaison)

“[International collaboration] is the best opportunity to improve our practice. It makes us improve our curriculum, our programs, and our training. [However, local participation in conjunction with international work is important] to show that they are doing something in their own country at some level, and to make sure that the needs of local organizations are also being prioritized.”

Exciting Development

Over 30 residency programs opened in the last two years. This is a significant achievement as there are now at least two EM residency programs in each of the 31 Mexican states with almost 400 new practitioners completing residency each year. Dr. Hall speculates that Mexico is on track to become one of the top 5 countries in the number of EM-trained physicians. “I think Mexico is a model for the development of EM, and I’m glad they’re finally getting the spotlight.”

Biggest Challenge

Along with the significant growth of EM comes growing pains. Mexican EM physicians “are the new kids on the block” and must now find their position in the pecking order among other specialties with longer, more integrated histories in Mexican medicine.

EUROPE

Germany

Student Interviewer: Tammy Tarhini

Ambassador Team Interviewee(s): Dr. Thomas Fleischmann
(ACEP Liaison)

“Never accept no as an answer [when pushing for EM development].”

Exciting Development

Though not yet recognized as a specialty, the development of hospital-based emergency care has finally begun to find footing. This development follows a 2018 piece of legislation from the German Medical Council describing minimum standards for hospital emergency care, to be implemented by state medical councils over a 5-year transition period. This led to the creation of subspecialties in acute care and EM comprising two years of ED training following the completion of residency in another specialty.

Biggest Challenge

Emergency care in hospitals has historically been provided by many departments independent of each other, with each wanting to assume responsibility for their respective emergencies; chest pain to the cardiologists, abdominal pain to the internists, and so on. However, these departments often send junior doctors to receive these emergencies, “sometimes within months of graduating medical school”, contributing in part to over-testing and over-admission into already limited hospital beds.

Italy

Student Interviewer: Vian Zada

Ambassador Team Interviewee(s): Dr. Alexandra Asrow
(ACEP Lead Ambassador)

“Patients are patients no matter where you go. Patients come with the same stuff, in different languages. Whatever the difference is, it’s in the systems and treating the patients is the same. You can take what you learn anywhere.”

Exciting Development

7 to 10 years ago, there were 500-600 EM residents in the country. For comparison, 800 people applied this year alone. This spike in interest and enthusiasm for the EM field — which was previously struggling for recognition — started just before COVID-19.

Biggest Challenge

The Italian Society of Emergency Medicine continues to seek ownership of EM’s unique skill set and legitimacy from other specialties such as some anesthesiology societies, who have control over critical care and many procedures like central lines and intubations.

Additionally, the quality of prehospital care varies widely between regions and tends to be localized to major cities. A large number of ambulance staff are volunteers; with requirements to work on an ambulance dependent on the region, and there are no national prehospital care guidelines or standard operating procedures. Transfer to higher specialty

care is thus more feasibly achieved in the north, where hospitals are larger and less crowded, and physicians tend to be better prepared. South of Naples, mortality and morbidity rates are higher due to this disparity in prehospital and hospital access.

Russia

Student Interviewer: Sean Flannigan

Ambassador Team Interviewee(s): Dr. Anthony Rodigin
(ACEP Lead Ambassador)

“Most physicians go into medicine for the right reasons and are not motivated monetarily. However, those choosing “emergency care” still face largely pre-hospital work due to a low number of functional EDs.”

Exciting Development

“Emergency care” as a specialty now recognized by law to include an in-hospital component. Over twenty EDs have opened up in various regions, though restricted to major cities. A national EM society is fairly active, pushing for further reforms.

Biggest Challenge

Tightening of the regime’s budget as the ruble drops comparatively to the USD and Euro has translated into fewer resources for EM in the country. This has resulted into an effective stagnation of progress in EM. Leaders in the field stationed mainly in St. Petersburg push to maintain past accomplishments as the government shifts its focus towards politics and civil unrest.

Turkey

Student Interviewer: Wesley Steeb

Ambassador Team Interviewee(s): Dr. Cem Oktay (ACEP Liaison),
Dr. Sabak Mustafa (ACEP Liaison)

“Emergency care in Turkey continues to expand after its initiation as a residency-trained specialty in 1993 making it one of the oldest emergency medicine residencies in Europe”

Exciting Development

Along with the expansion of residency training, the physical size of EDs has expanded in recognition of the importance of emergency care in achieving public health goals and patient safety. The expansion has also included equipment, especially ultrasound.

Biggest Challenge

With such rapid growth, identifying and retaining faculty remains the greatest challenge to fostering the continued growth of EM as a specialty. There are only 300-350 emergency medicine faculty in the country. We don’t have enough attending physicians specifically for training hospitals. ... It’s a big problem for the residents, they don’t get enough education specifically on the night shifts.”

ASIA, OCEANIA, AND THE PACIFIC

India

Student Interviewer: Jemima Stanley

Ambassador Team Interviewee(s): Dr. Lingappa S. Amermath
(ACEP Lead Ambassador)

“You are not going to be ordering all sorts of tests, imaging, CAT scans, MRI on a person who makes \$100 a month and

wipeout his income looking for zebras. It's very focused (and involves) very limited tests. If you are in a corporate hospital, you are going to be doing similar tests to what we do (in the US). Cost is not a factor for them, and patients want everything done because they are happy to pay for it. It's a different practice, so I would say modify it according to where you are. If you are in Rome, be a Roman."

Exciting Development

EM was recognized as a new academic discipline in 2009. Even after this occurred, there was still a lot of debate on the implementation of EM training due to the lack of resources (such as faculty) and buy-in from the people. However, in October 2020 a law was passed by the Indian government to mandate that medical schools have an ED in their teaching hospitals and a Medical Council of India approved a 3-year EM residency program. This was a huge milestone in the development of EM in India.

Biggest Challenge

There are 1500 EM physicians for 1.3 billion people. To put this into perspective, the overall density of EM physicians per 100,000 population is 0.115 in India as compared to 14.9 in the USA.

New Zealand

Student Interviewer: Grace Brown

Ambassador Team Interviewee(s): Dr. Michael Connelly (ACEP Deputy Ambassador)

"It's always our goal to provide the best care, but we are trying to be more outspoken about how we deliver that... and set up that feeling of cultural safety within EDs in New Zealand."

Exciting Development

Australian College for Emergency Medicine has committed to equity for Māori through the launch of a strategy called Manaaki Mana: Excellence in Emergency Care for Māori, in 2019. It seeks to tackle the challenges of health equity, especially in the ED. Although some gains have been made over the past 30 years to improve health outcomes for Māori, there continue to be consistent and large disparities in health outcomes, exposure to the causes of poor health, inadequate health system responsiveness, and under-representation of Māori in the health workforce.

Biggest Challenge

One of the biggest strains on the ED, is access block and the use of the ED as a type of short-stay ward. The Ministry of Health is recognizing the importance of the efficient disposition of patients and has a target to move 95% of patients through the ED within six hours. "There isn't enough space to see the patients coming in, and there isn't enough movement in the hospital upstairs to move patients forward. So, it has really been a struggle to get hospitals to understand what happens upstairs affects the front door (the ED)." Currently, no District Health Board is meeting these targets, so there is still significant work to be done in this realm.

Philippines

Student Interviewer: Ogechi Nwodim

Ambassador Team Interviewee(s): Dr. Tao Zhu (ACEP Deputy Ambassador), Dr. Ted Herbosa (ACEP Liaison), Dr. Elis Maghirang (ACEP Liaison)

"We were seen as jack of all trades and master of none. But now, we as a specialty have been able to prove ourselves, not only in the emergency room but in other positions. Now, our colleagues have realized we are very good partners to work with, not only in the hospital but also elsewhere."

Exciting Development

The most exciting development is the gain of respect for the specialty as a whole. Growth is exciting! Now the younger EM doctors are in disaster medicine, pandemic medicine, legislation, global health, and many other sectors in medicine. This growth was exemplified by the growth of the yearly EM society conference as well as increases in residency programs, public hospital EDs, and increased income for EM physicians.

Biggest Challenge

The greatest challenge is that the current supply of EM physicians is not meeting demand. "Many go to Australia to work with maritime cruise ships and oil rigs, or to be resort physicians in the Bahamas. This is good because the training is being recognized internationally, but they are leaving. Half of them want to leave and half of them will be gone in two years. It's this double-edged sword, you see. We are proud that they are competent to work internationally, but we are also sad because the Philippines also needs more physicians nationally. This is the price that we have for our success."

Sri Lanka

Student Interviewer: Shruti Gujran

Ambassador Team Interviewee(s): Dr. Arun Nandi (ACEP Lead Ambassador)

"Half the time, the solution [is to] listen to the family, as they know the patient far better than you can. In a region where the income of a family can depend on one person, the existence of a family can depend on the health of one person. By listening to the family, to the patient, and even stuff that doesn't make sense to you, it can be extremely valuable to you and to the longevity of the patient and community."

Exciting Development

A virtual EM residency training effort has been organized over the past few years by several consultants from the US, UK, Singapore, and Australia to address the resource limitations for training residents. With the first EM consultants gradually starting in Sri Lanka, they will assume the crucial role of educating and training future generations of emergency physicians in Sri Lanka.

Biggest Challenge

Residents must go abroad to complete their training in their final year, which results in trainees who are exposed to technology and environments that they may not have access to at home. For example, "in their last year of training in the UK or Australia, learning point-of-care ultrasound, airway management... [residents] are learning in a country where you do things totally differently,

resulting in an artificial learning curve.” To address this, infrastructure must be built within Sri Lanka, so residents are able to train locally within the tools available.

Thailand

Student Interviewer: Spencer Seballos

Ambassador Team Interviewee(s): Dr. Pholaphat Charlie Inboriboon (ACEP Lead Ambassador), Dr. Wirachin Hoonpongsimanont (ACEP Deputy Ambassador), Dr. Khuansiri Narajeenon

“[My global work] has given me a shift in mindset — thinking about resiliency; international physicians have a lot of barriers, like resource limitations and volume of patients. It reminds you that it’s also occurring elsewhere too — we’re all in this together. There are different systems in different countries, such as Thailand. They make you think about ways to make the system more efficient here: do we need to do all of these steps [in America]?”

Exciting Development

Recently, the Chulalongkorn University EM residency program developed the “Thai College of Emergency Physicians Application,” a tool to assist all residency programs in collecting trainees’ education portfolios and assessing their progress during residency training. This tool allows for the collection of country-wide data and comparison of trainee milestones (entrustable professional actions, procedure logs, conference attendance, and multisource feedback/evaluation tools) between programs. This application reduces the administrative

burden of data collection and provides a dashboard to review results and share feedback.

Biggest Challenge

Thailand has fewer emergency physicians than other specialties. Additionally, the system does not encourage physicians to practice EM and serve as educators in the university setting. A significant challenge is the lack of an appropriate EM-specific reimbursement system that leads to low revenue in the department. The base salary for academic and public hospital EM physicians is significantly lower than those in the private sector. Consequently, many government and academic physicians must moonlight at a private hospital to support themselves.

Conclusion

These interviews provide a glimpse of many exciting developments in EM around the globe and the complexities of integrating EC into a nation’s healthcare system. We hope that these stories will inspire members of the EMRA community to continue engaging in collaborative efforts to develop high-quality EC worldwide.

GEMS LP

If you are a medical student, resident, or attending who is interested in global emergency medicine (GEM), we encourage you to reach out to us at info.GEMSLP@gmail.com. We are always looking for motivated and passionate students to join our next cohort of mentees, as well as mentors to help guide them in their GEM journey. ★

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Physical Therapists in the ED



Christopher D. Laube, EMT-B

University of Arizona College of Medicine –
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Physical therapy in the emergency department is a relatively novel practice; however, over the past decade it has started to become more common, with 23 major medical systems across the U.S. reporting the use of emergency department PTs as of 2014.¹

Naveed Shan, DPT, is a physical therapist in Phoenix who works in the emergency department at Banner University Medical Center. He has been practicing in the ED since January 2018, where he continues to learn and grow as a clinician.

What does a day in the life of an ED PT look like?

NS: So, for me personally, I've shadowed one or two other ED PTs, but

I can only speak on my own account. I typically get in and look over the board and see what patients are in, and then talk to the NPPs (Non-Physician Practitioner) or the physicians about whether I can help their patients. Or I just wait for them to refer patients to me. On a slow day, I'll see 6-8 patients, but it varies a lot. I think the most I've seen in one day was 20. I would say 6-15 would be a good average.

What do you do for your patients in the emergency setting?

NS: It depends on what their needs are, but my main focus is trying to reduce pain and get them moving so that they can be discharged home. Most of the patients I see are very non-urgent. They are usually the patients that most NPPs and Physicians aren't super excited about, like the guy who comes in and he's had knee pain for two or three weeks. That's

where I come in - because I'm actually excited about the knee pain that they've had for 3 weeks. I can also help with patients who come in with dizziness or vertiginous symptoms. I can work with the NPPs and Physicians in deciphering a few things: between peripheral or central causes of vertigo and whether I can treat them in the ED or if they need to be referred out. I also do disposition evaluations. For the patients with failure to thrive, or those who aren't sick enough to be admitted but may need skilled nursing facility placement, I can help determine if they're safe to go home from the mobility standpoint.

What's your relationship like with the other staff: the physicians, the residents, the nurses?

NS: It's great. But it took a long time for everyone to be comfortable referring to me. Like, for the first six months I

was there I hardly saw anybody because the docs weren't comfortable just letting this random PT just show up and come see their patients. I remember asking a practitioner, "Hey can I see your patient with back pain?" And she said, "Not before I see her, I don't want you to kill this patient." She had no idea what I did. So it took a lot to gain the trust of the physicians, NPPs, and nurses. The biggest thing is making sure everyone is comfortable with me working with their patients. I'd like to think I have great relationships with all of them now; we discuss cases and break down different things and I learn from them every day. I hope that I've taught them a thing or two.

What benefits do departments that have physical therapists see versus those that don't?

NS: It varies based on how they're utilized. We're still very early on in PT in the ED in the U.S., but we've found that there is reduced imaging utilization, reduced opioid prescriptions, reduced length of stay, improved patient satisfaction, and overall reduced cost,

in part because of better referrals to outpatient PT and orthopedics and sports med. Especially in patients who needed home health or SNFs (Skilled Nursing Facilities), PTs helped reduce the number of visits and cost in the long run.²

What kind of things would you like to see ED docs do more in their work with you?

NS: I think it varies from physician to physician. Ideally I would like every Physician to utilize us appropriately and realize what our knowledge base is. Really I wish they understood our scope of practice better. I don't expect every ED Physician to know what physical therapists do; we're a young profession. PT has only been around for 100 years and really only started in the ED in 2000, with Mike Lebec. It's still a very novel approach. And not every system has access. If I went to a town of 10,000 people, ED physical therapy would be unheard of. But I hope that with time the ED physicians will understand the role of physical therapy and how it can be utilized.

So what about when you're working with NPPs, physicians, and residents that you wish they would do less, or maybe not at all?

Naved: There's one thing they do, and sometimes it's appropriate and sometimes it's not, but they'll tell me, "I want you to wait until the medication kicks in." Like they just need to take the edge off, but I would rather see the patient at their worst to determine what I can do, and to get to the root cause of the dysfunction if I can at that moment. Waiting until the meds kick in can make my physical therapy management a little more difficult. But that's also a case-by-case basis. One thing about PT that is mismanaged in the ED setting is the wait time. From the time the patient comes in to the time they're seen, I think it just makes for a better patient experience. I still come in as an afterthought and I wish I was consulted earlier on patients. Like if they had called me earlier, this guy with back pain could have been gone an hour ago. ★



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From Scribing Notes to Saving Lives

The Transition from Scribing to Medical School and Beyond

Patrick Anderson, OMS-III

Nova Southeastern University KPCOM

Receiving that acceptance letter to medical school is one of the most exciting and joyous moments in an aspiring physician's life, but the path leading to that letter can be daunting, to say the least. One of the biggest contributors to this ever-growing ball of stress and anxiety is finding extracurricular involvement and medical experience you believe will make you a standout applicant. Is there one experience that is better than the rest? Subjectively, scribing in the ED not only helped guide me toward a career in emergency medicine but also gave me the type of exposure and experience needed to be a great medical student.

The Role of a Scribe

As a scribe, you accompany the resident, attending, or non-physician provider into every patient encounter as they obtain a history, perform a physical exam, and discuss their assessment and plan with the patient. Scribes see everything from the sniffles to level 1 trauma alerts. They are responsible for writing all the health information collected into the electronic medical record in an organized, fluent, and detailed manner. In a teaching hospital, educational points will be made during the patient presentation, treatment plan, and workup. Scribes hear it all.

During my 2 years of scribing in the ED at UF Health Gainesville, I gained a tremendous amount of knowledge that I did not fully appreciate until medical school. I was able to answer countless exam questions using my prior scribe experience. Learning how to perform a patient exam and write a SOAP note came much easier. The knowledge and skills I gained from watching thousands of patient encounters and resident presentations as a scribe gave me the

confidence to see more patients and get more involved during clinical rotations.

My mentor, Alexa Peterson, said, "Looking back, if I had to pick, being a scribe prior to medical school was the single most beneficial thing I did to prepare myself for this path. It was what propelled me into the field of emergency medicine. First, it taught me time management and prioritization, both of which we know are critical for surviving medical school. More important, scribing provided me with the best mentors. I came out of that experience thinking, 'I want to be those docs.' The physicians I was working with offered guidance on why I should pursue medicine and the admission process, provided teaching points on difficult patients, and were always motivating. These aspects were extremely important because nobody in my family is a physician and I was lacking mentorship at home.



"Yes, EM is fast-paced shift work, with endless variety that can make the specialty appealing on the surface, but for me, it was the people I met in that department who made me feel part of the team and made me feel welcomed in the specialty."

EM resident Annabeth Johnson, DO, of Morristown Medical Center, said

scribing prepared her for residency. "The skills I acquired through my time as a scribe helped prepare me for many of the challenges I encountered not only in medical school but also in my first year of residency. I gained exposure to medical terminology, learned how to properly document, and became familiar with formulating a differential diagnosis. Working alongside physicians trained me to think clinically and allowed me to see firsthand all the different hats physicians wear when it comes to patient care. These are skills that have served me well during my audition rotations and into residency as I work with patients from all walks of life." This shows just how impactful being a scribe can be. Four years after scribing, Dr. Johnson is still implementing some of the skills and knowledge acquired from scribing as she cares for her patients every day.

Attending physicians who have worked with scribes notice students with scribe experience. Diana Mora-Montera, MD, Ultrasound Director and Assistant Program Director at North Florida Regional Medical Center, said, "I did my residency at a program with its own scribe program. I worked side by side with hopeful undergrads who had a better idea of what medicine really is about, than I did as a third — or fourth-year medical student. Later as a brand-new attending, I often discussed the differential diagnosis and workup of complicated case presentations with scribes, not only as a way of teaching but also as a sounding board. There is a drastic maturity level and clinical acumen that is obviously identifiable in medical students who have been scribes."

If you are a pre-medical student looking for that one experience in medicine to give you an edge, then grab a laptop and head to the local ED, because scribing is calling your name. ★

A Revamping of an Old Practice

HEAD-UP CPR

Glenn Goodwin, DO, EMT-P

Aventura Hospital and Medical Center
Charles Latimore, MD, Pharm-D
Aventura Hospital and Medical Center

From intravenous drugs and genetic engineering to highly advanced equipment to mind-blowing surgical techniques, medicine continues to evolve at an exponential pace. In an almost comedic way, despite this evolution, “good old-fashioned” chest compressions are the only consistent intervention to improve cardiac arrest outcomes.¹ Cardiopulmonary resuscitation (CPR), however, is not immune to this omnipresent evolution. We are reviewing a whole new way of performing this life-saving practice: head-up CPR.

Background

The objective of CPR is to take the place of a nonfunctioning heart in delivering blood, and therefore oxygen and other essential products, to the body. Traditionally, the heart is compressed between the sternum, posterior rib cage, and spine supine.² During the past several years, many theories began to emerge regarding the

optimization of this practice. Different experiments were done, mostly in pigs, tracking the amount of blood flow that travels to the brain and other organs depending on certain body positions.^{3,4} The pigs were sedated and induced into cardiac arrest, after which they underwent CPR in supine, Trendelenburg (head and torso angled inferiorly to rest of body), and reverse Trendelenburg positions. Investigators consistently found that the reverse Trendelenburg position increased perfusion to the brain by 15-20%.⁵

Interestingly, Trendelenburg resulted in cerebral venous pooling, impeding blood flow and circulation to the brain and reducing venous return subsequent blood flow to other distal organs. Consequently, many of the pigs ended up with cerebral swelling along with a marked decrease in perfusion to the rest of the body.^{4,6} By angling the body in the opposite direction, venous drainage, and distal perfusion were optimized.

There are three main mechanisms by which head-up CPR is thought to have such profound optimization:



1. The primary mechanism of benefit behind head-up CPR is the utilization of gravity in augmenting venous drainage, thereby decreasing ICP and facilitating distal blood flow.⁶
2. The second mechanism of benefit is thought to be the concept of decreasing the concussive force of the blood being thrust into and out of the brain.⁶ Angling the head upwards decreases these forces.
3. A third mechanism involves redistributing blood flow through the lungs in a manner similar to when patients with respiratory distress/failure sit upright (“tripoding”).⁶ Standing and sitting upright are the ideal positions for breathing and circulation.⁷ It wasn’t long before these exciting effects made it to the attention of EMS medical directors and fire chiefs.

Historically, return of spontaneous circulation (ROSC) rates of out-of-hospital cardiac arrest (OHCA) have ranged between 20-30%.⁸ In other words, only 20-30% of patients who suffer OHCA ever regain a pulse. According to some studies, many of these patients who regain a pulse only do so for a short period, rarely making it to being discharged from the hospital; survival to hospital discharge (SHD) is around 8-9%.⁸ Even more unattractive, the neurological outcomes of these

Since employing head-up CPR protocol, ROSC rates are averaging 51% for the past three years (2016-2018), regardless of the rhythm the patient was found in, if the arrest was witnessed, or if CPR was applied prior to arrival.

few who have survived are almost always dire. In a ground-breaking trial, the Rialto Fire Department (RFD) in California began performing head-up CPR for their cardiac arrest patients. The results have been exhilarating. Previously, Rialto's ROSC rates were around 23%, meaning that only 23% of cardiac arrest patients ended up regaining a pulse.

Since employing head-up CPR protocol, ROSC rates are averaging 51% for the past three years (2016-2018), regardless of the rhythm the patient was found in, if the arrest was witnessed, or if CPR was applied prior to arrival.^{9,10} Additionally, SHD has ranged from 12-14%.^{9,10} Asystole is ubiquitously regarded as the rhythm with the poorest prognosis in cardiac arrest. What is perhaps the most astounding, the RFD rate of ROSC for the initial presenting rhythm of asystole, including unwitnessed arrests, is 26%?¹⁰ While the ROSC rates have been extremely encouraging, the next phase of assessment concerns neurological outcomes. Currently, several studies are underway to track the neurological outcomes of OHCA survivors who received head-up CPR. Exploring the neurological benefits of

head-up CPR has pragmatic implications as there is often a conflicted sense of accomplishment when achieving ROSC in a patient who has no chance at any sort of neurological recovery.

How to Perform Head-Up CPR

The optimal mechanism for performing head-up CPR has not been rigorously studied yet; however, Rialto has paved the way for a solid starting point. One must first perform CPR flat before elevation, which is thought to prime the cardio-cerebral circuit.⁶ Once primed, the head is to be elevated 30 degrees. Interestingly, prior pig studies found diminishing returns and harm when elevating the head greater than and below 30°. Regarding how to perform the compressions with this new angle, the ideal method is to use an automated CPR device (Lucas, Autopulse, etc.). Performing human-powered chest compressions on an angled patient could potentially compromise the quality of those compressions, especially in the prehospital setting, making these automated CPR devices crucial. Additionally, RFD used an Impedance Threshold Device (ITD).¹¹ This is a small device that attaches in between the ET

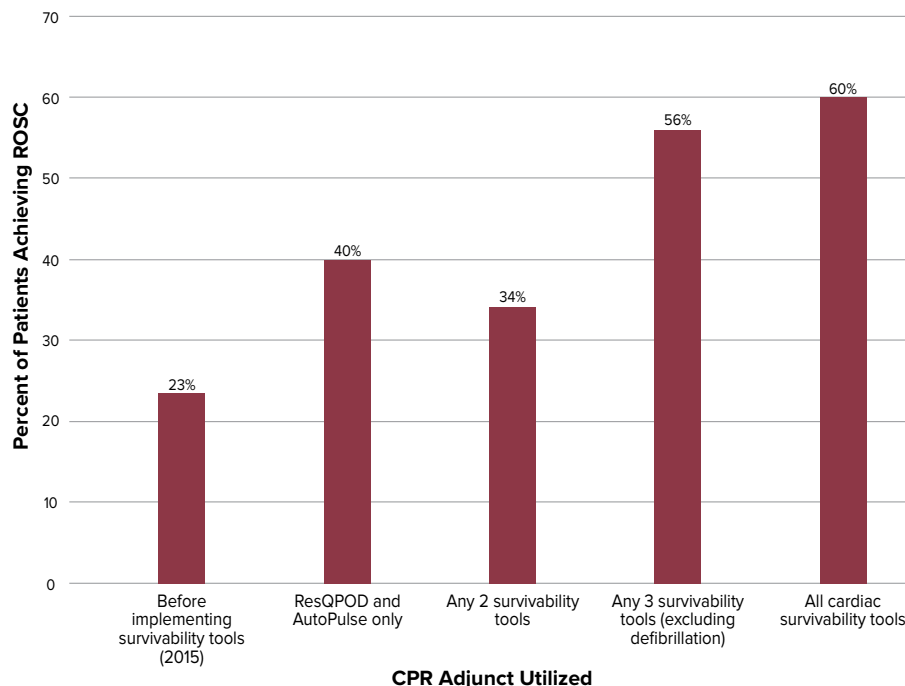


The objective of CPR is to take the place of a nonfunctioning heart in delivering blood, and therefore oxygen and other essential products, to the body.

tube and bag valve. It acts as a one-way valve, allowing oxygen to be delivered during ventilation while restricting ambient air from entering the thoracic cavity during the recoil phase of chest compressions.¹¹ This increases negative intrathoracic pressure creating a vacuum that pulls more blood back to the heart, increasing preload and decreasing intracranial pressure (ICP), allowing for quality cerebral perfusion.¹² While theoretically beneficial, when the ITD has been used on its own, studies have been mixed regarding effectiveness and differences in actual outcomes. It appears to have a synergistic and multiplicative effect when used in head-up CPR, however. This synergy seems to be evidenced by abrupt increases in ETCO₂ values following ITD placement, head-up CPR already being performed in the setting. However, it is unclear how much of a ETCO₂ rise occurs from head-up CPR on its own.¹⁰

Capnography and ETCO₂ monitoring have long been crucial in guiding CPR quality and prognosis. Generally,

FIGURE 1. ROSC Achievement by CPR Adjunct



Data obtained from <https://www.jems.com/patient-care/seven-tools-result-in-dramatic-improvements-in-cardiac-arrest-outcomes-in-rialto-calif>

ETCO₂ > 15 mmHg during CPR is an encouraging value, indicating good compressions and relatively increased chances of ROSC. Below 10 mmHg is usually considered as reasonable evidence to cease CPR.¹³

The encouraging numbers from RFD may not have been due to head-up CPR alone. RFD developed a set of 7 practices that had to be employed while utilizing head-up CPR:¹⁰

1. Continuous uninterrupted compressions utilizing an automated CPR device;
2. Apneic oxygenation- placement of nasal cannula 15L/min prior to and during ventilations
3. Use of an impedance threshold device (ITD)
4. Head-up CPR
5. Delaying defibrillation for a certain subset of patient presentations — Prolonged downtime patients, fine V-fib, and having ETCO₂ reading <20mmhg were not defibrillated. Once ETCO₂ 20mmhg or greater, or

change into shockable rhythm occurred, defibrillation was performed. The theory is that the acidotic heart is less receptive to electrical current.

6. Utilization of waveform capnography
7. Deprioritizing epinephrine in the order of intervention — Not administering epinephrine until ETCO₂ values were ideal and/or until CPR had been underway for a certain period of time. It is believed that by administering epinephrine in less acidic and more perfused environment, it has greater chances of benefit.

Conclusion

The practice of head-up CPR is exciting and encouraging, but much more data is needed before global implementation. RFD continues to utilize head-up CPR and several other fire departments are also implementing it, most notably Palm Beach Fire Department in Florida. Additionally, several studies are currently being conducted in a controlled setting to identify survivability and neurological outcomes.¹⁴ Perhaps in several years, data will be robust enough to prove or disprove its perceived benefits. ★

TAKE-HOME POINTS

1. Head-up CPR is showing promising effects in cardiac arrest outcomes.
2. 3 main mechanisms of head-up CPR benefit are decreasing cerebral venous pooling, decreasing the convulsive force of blood entering the brain during supine CPR, and facilitating blood flow into the lungs (sitting up/standing up is ideal for this), leading to relatively optimal oxygenation.
3. Performing head-up CPR requires some special equipment and techniques.
4. Several studies are being conducted to draw more definitive conclusions.

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Impact of Radiology Turnaround Time on ED Operations

Literature & Strategies Review

Clinton Lam

Touro University, Nevada College of Osteopathic Medicine
Class of 2023

Jared Ditekowsky, MD

EMRA Administration & Operations Committee, Immediate Past Chair
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Review of Literature

① **Radiology imaging delays as independent predictors of length of hospital stay for emergency medical admissions**

The authors studied the effects of computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound (US) TATs on hospital length-of-stay and cost of care for inpatients admitted from the ED. They found that a greater TAT was associated with longer hospital length of stay for all imaging modalities studied (see Table 2), and an increased cost of care was associated with greater usage of CT and MRI TATs.² Although previous studies suggest that early advanced imaging may improve patient outcomes and decrease length-of-stays, these results illustrate that increased utilization of imaging may be a driver of increased length-of-stays and hospital costs. The authors suggest that a limited radiological imaging capacity may

exacerbate imaging delays for inpatients from the ED. Therefore, as the inpatient demand for advanced imaging continues to increase, potential cost savings may be achieved through expanding radiological imaging capacity to decrease TAT, length-of-stay, and hospital costs.²

② **Practice policy and quality initiatives: decreasing variability in turnaround time for radiographic studies from the emergency department**

The authors implemented quality improvement techniques at a large, full-service, tertiary-care hospital and studied their effects on ED radiograph TAT variability and ED throughput. The primary intervention was dissemination of daily TAT reports to radiologists to promote transparency

and performance feedback (see Figure 1). Other interventions included changing radiology staffing and teaching radiologists' practices to be more efficient. The results of the quality improvement initiatives are as follows:

1. The mean ED radiograph TAT decreased from 23.9 minutes to 14.6 minutes.
2. The percentage of ED radiographs read within 35 minutes increased from 82.2% to 92.9%.
3. The standard deviation of ED radiograph TAT decreased from 22.8 to 12.7.
4. The mean ED "doctor to disposition" time for Emergency Severity Index class 4 or 5 patients decreased from 88.7 minutes to 79.8 minutes.

The authors suggest that the usage

TABLE 1. Multivariable Adjusted Poisson Model for Total Length of Hospital Stay

Type	Variable	IRR ^a	p > [z]
Computed tomography	p50-p75	1.01 (0.98, 1.05)	0.57
	p75-p90	1.15 (1.11, 1.19)	0.001
	> p90	1.33 (1.28, 1.39)	0.001
Magnetic resonance imaging	p50-p75	1.18 (1.12, 1.25)	0.001
	p75-p90	1.42 (1.34, 1.51)	0.001
	> p90	1.45 (1.34, 1.58)	0.001
Ultrasound	p50-p75	1.07 (1.03, 1.12)	0.002
	p75-p90	1.18 (1.12, 1.24)	0.001
	> p90	1.19 (1.12, 1.26)	0.001

Cut-offs refer to the 50th, 75th, and 90th centiles of the time distribution from order to completion for each imaging method as compared with those having undergone no imaging examination.

^aThe incidence rate ratio is hazard ratio based on the rate or incidence of counts computed from the truncated Poisson model.

of standardized reports, workflow design improvements, and reading room enhancements can help optimize ED radiograph TAT variability and mean ED radiograph TAT. Since the mean ED “door to disposition” time decreased with improved TAT, efforts to decrease ED radiograph TAT may have the added benefit of improving patient flow.³

③ Improving Emergency Department radiology transportation time: a successful implementation of lean methodology

The authors implemented and evaluated the results of a Lean methodology-based intervention to decrease the plain radiograph transportation TAT, the time from when the study is ordered to the time when the study is completed, in the ED of a tertiary care center. The three primary Lean tools used by the authors are as follows:

1. The authors assembled a **kaizen** team to engage stakeholders from various levels to achieve continuous process improvements.
2. **Value-stream mapping** aided in identifying activities that added value as well as activities that did not, eliminating waste and redundancies.

3. The authors employed **kanban** in the form of information systems that alerted radiologists to pull patients ready for imaging to the radiography suite.

Results of the intervention:

1. The transportation TAT decreased from 22.9 minutes to 9.9 minutes.
2. The percentage of patients being transported within 10 minutes increased from 32.3% to 71.6%.
3. Patient length-of-stay decreased from 4.57 hours to 3.65 hours.

The authors conclude that Lean methodology and tools, such as those described above, can be employed with great success by ED administrators to improve TAT, throughput, and other key metrics in ED settings.⁴

Summary of Literature

Prolonged radiology TAT contributes to a myriad of problems affecting ED operations including overcrowding, and negatively impacts metrics such as throughput, costs of care, and length-of-stays.^{1,2,5} Factors such as limited radiological imaging capacity have been shown to contribute to imaging delays.² Recent studies illustrate that quality improvement initiatives that target

human behavior, process design, and system issues have found considerable success in reducing mean TAT, TAT variability, and ED throughput.^{3,6} Lean methodology and tools have also been successfully applied to ED imaging transportation processes, resulting in decreased transportation TAT and length-of-stays.^{4,7-9} ED administrators can pursue similar interventions to improve process efficiency as well as key safety and quality metrics, leading to superior patient care and workflow.

Looking Forward/What's Next

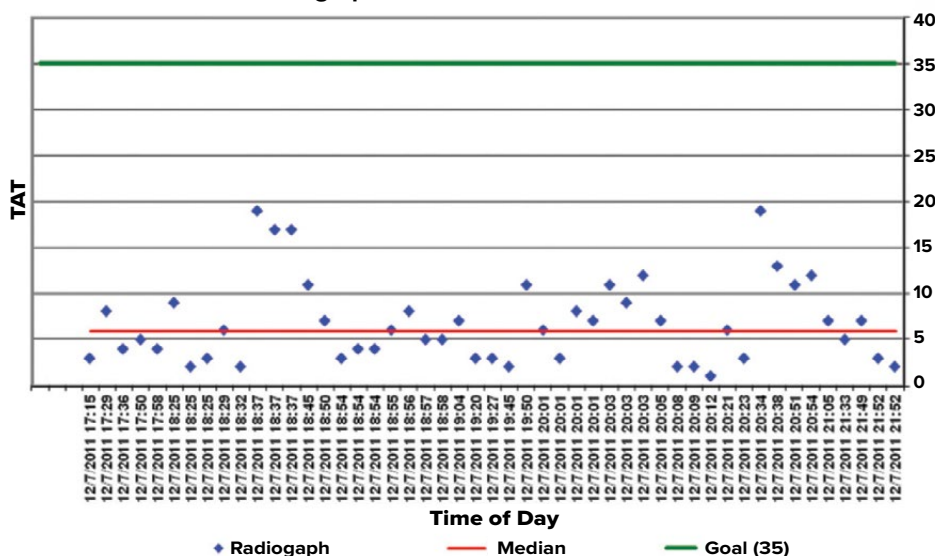
Over the past two decades, technological breakthroughs such as picture archiving and communication systems (PACS) and speech recognition softwares have reduced radiology TATs from days to hours.³ Moreover, early advanced inpatient imaging, which is increasingly utilized, may improve outcomes but may be associated with longer TATs that can be addressed from an operational standpoint. In order to continue reducing the TAT and combat ED overcrowding and other challenges, more ED administrators are employing methodologies like Lean and Six Sigma to improve operational efficiency and deliver more exceptional patient care. Furthermore, certain Academic Emergency Medicine departments are beginning to consider quality improvement projects that seek to reduce CT burden in the ED by determining the extent to which certain urgent and emergent imaging studies alter disposition. More research is underway to investigate the best means to ascertain and address the impact of radiology TAT on ED operations.^{10,11}

EMRA Administration & Operations Committee Links, Guides, and Opportunities

Check out what's happening with our group at the EMRA A&O landing page! <https://www.emra.org/be-involved/committees/administration-and-operations-committee>

Looking to gain a mastery of this and other relevant operational knowledge? Consider applying for EMRA's ED Directors Academy scholarship! <https://www.emra.org/be-involved/awards/edda-travel-scholarship> ★

FIGURE 1. TAT for ED Radiographs



Radiologist x 12/7
n:49; mean 6.8; Median 6; 100% < 35 min

Daily TAT report. This report is sent to the radiologist the day after he or she is on call. The x-axis shows the time the study was completed in the RIS, and the y-axis shows the TAT. Each blue point represents the TAT for one ED radiograph. The red line represents the median TAT for the call shift, and the green line is the target of 35 minutes. Each radiologist is provided with the number of studies he or she read, along with his or her mean TAT, median TAT, and percentage of studies read in 35 minutes or less.

Pay No Attention to the Intern Behind the Curtain

Tips for Success on your Anesthesia Rotation

Richard J. Cunningham, MD

Emergency Medicine Resident, PGY-3
Maricopa Medical Center
@HappyDays_EM

Endotracheal intubation is one of the most high-stakes and critical procedures we as emergency physicians perform; one study found that 4.2% of Emergency Department intubations resulted in a cardiac arrest.¹ It is now standard for most emergency medicine residents to learn this skill in the operating room under the guidance of anesthesiologists and certified registered nurse anesthetists (CRNAs). Because there are fundamental differences between airway management under emergent and elective settings, it is easy for an EM resident to become flustered and perhaps even frustrated while working in these environments. This article will summarize some tips and tricks for EM interns which can be used to maximize their experience on their anesthesia rotation.

Recognize and Appreciate the Differences Between Anesthesiology and EM

It doesn't take long to realize that anesthesiologists are generally much more cautious than emergency physicians. Many EM trainees, myself included, have been perplexed when told we should "probably just watch this one" when a patient in the OR was undergoing a rapid sequence intubation (essentially the only means of performing intubation in the emergency setting). While this difference in attitudes may be attributable to the personalities attracted to each specialty, it is important to recognize that the history of anesthesiology is also a contributor.

While undergoing anesthesia today is very safe, this has not always been the

case. A landmark study published in 1954 by Beecher and Todd found that anesthesia-related deaths occurred in 64 out of every 100,000 procedures.² At that time, this was more than twice the mortality associated with polio in the United States. In the decades since, intense research efforts in the field of anesthesiology have reduced the mortality risk of anesthesia from 1 death per 1000 operations in the 1940s to 1 in 10,000 in the 1970s, and then to 1 in 100,000 in the 1990s and early 2000s.³ These numbers help put into perspective the heavy emphasis on patient safety in the field of anesthesia, which has led to clearly better patient outcomes. With that in mind, it seems perfectly reasonable that an anesthesiologist would be wary around EM residents fresh out of medical school with only a few intubations under their belt. While you will likely find some anesthesiologists who are very patient with learners, don't take it personally if you are (gently) shoved aside during an intubation attempt in the operating room.

Verbalize!

I've found one of the best ways to gain the trust of anesthesiologists is to clearly communicate with the supervising physician or CRNA. Richard Levitan, a leading expert on emergency airway management, describes the "mystique of direct laryngoscopy."⁴ While thought to be a relatively straightforward procedure, given the inherent limitations of direct laryngoscopy (only the operator has a clear view of what the laryngoscope reveals), trainees are often restricted to learning this technique via "trial and error" as more experienced supervisors are limited in their ability to coach them through troubleshooting maneuvers

when the glottis cannot be visualized.

I've found that clearly verbalizing what I see during intubation goes a long way toward mitigating these limitations. During each intubation attempt, I systematically call out each airway structure I see as I advance my blade in the patient's mouth: "I see lips, I see teeth, I see tongue, I see soft palate, I see uvula, I see tonsils, I see epiglottis... and I see cords." I've found this strategy to put my supervisors at ease and make them more willing to allow me extra time to troubleshoot when I am unable to obtain an adequate view of the vocal folds. In addition, I believe this methodical and deliberate identification of airway structures has aided me in orienting myself during my more difficult intubations in the Emergency Department.

Visualize!

Now that I am about halfway through my 3-year residency, I have performed more than 100 intubations. However, if you include every intubation I've rehearsed in my head, that number would be around 10 times higher.

Visualization is a popular strategy employed by many athletes (including legends such as Muhammad Ali and Billie Jean King), though its effectiveness is not limited to sports. This technique translates to any motor skill or procedure, including intubation. One study showed that performing mental exercises of finger abduction (with no *physical* exercise) increased finger strength by 35%, compared to no increase in the control group.⁵ When it comes to skill acquisition, the power of the mind can go a long way.

Be the Anesthesiologist!

Scott Weingart of the EMCrit podcast says in the show's inaugural

episode that emergency physicians should “stop thinking like a surgeon and start thinking like an anesthesiologist.”⁶ His point is that EM doctors should be able to perform any task in their department without the help of auxiliary staff (eg setting up a BiPAP machine, adjusting drip rates on IV infusion pumps, placing OG tubes, etc). I wholeheartedly agree with this sentiment. While nurses, emergency

technicians, and respiratory therapists are vital members of our team, we as emergency clinicians should be self-sufficient resuscitators. One of the best ways to learn the skills necessary to be one is alongside anesthesiologists.

While it is easy to fall into the mindset that an anesthesia rotation is meant to “get your numbers,” it is crucial to realize that there is much more to proper airway management

than placing the “tube in the hole.” Evaluating an airway, properly positioning a patient, performing bag-valve-mask ventilation, and placing a supraglottic airway are all indispensable skills that can and should be learned in the operating room under the guidance of an airway expert. In addition to airway management, the OR is a great setting to learn how to set up and adjust IV infusion pumps, place peripheral IVs (*without* ultrasound), and even attach a patient to the monitors. I’ve found that displaying an interest in learning all of these skills, as opposed to solely focusing on intubation, goes a long way toward earning the trust of anesthesiologists.


It’s Okay if You Miss

In the popular children’s show *Adventure Time*, Jake the Dog shares a salient piece of wisdom: “Dude, suckin’ at something is the first step to being sorta good at something!” I’ve found few other quotes to be as relevant to airway management, and medicine in general.

While emergency intubation has been shown to be highly successful,⁷ achieving a high success rate takes time. One study found the success rate of anesthesia residents to be below 50% within the first 10 intubation attempts, and a mean of 57 intubation attempts was required to reach a 90% success rate.⁸ Moreover, 18% of the residents required assistance even after 80 intubation attempts. So if you find yourself floundering during your first week, rest assured that you will improve. What’s more, even the best of us will encounter an airway we have difficulty with, even after we are considered to be “competent.” When it comes to airway management, humility is key. Success is not final, and failure is not fatal.

Conclusion

Airway management is a crucial skill for emergency physicians. While you may encounter ups and downs during your anesthesia rotation, have patience and faith in your training. With deliberate practice and dedication, you too will master this essential and esoteric skill. ★



It is now standard for most emergency medicine residents to learn this skill in the operating room under the guidance of anesthesiologists and certified registered nurse anesthetists (CRNAs).

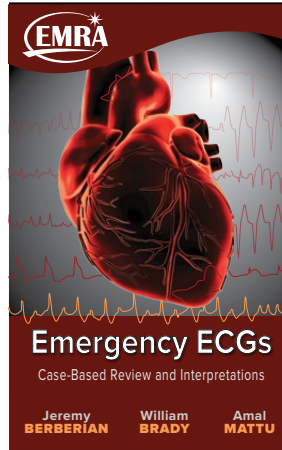
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ECG interpretation is an essential skill in emergency medicine, and EMRA's newest guide — a Kindle exclusive — will become one of your favorite ECG resources. "This collection will knock your socks off," said reviewer **Judith Tintinalli, MD, MS**. "Clinicians who want to stay sharp (at least as sharp as their residents) will find it interesting and challenging! It's just never too often to test your ECG wits."

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Toy Selected as *Annals* Resident Fellow

Each year, *Annals of Emergency Medicine* selects a Resident Fellow (formerly the Resident Editor) to serve on the Editorial Board. We are pleased to announce that Jake Toy, DO, of Harbor UCLA Medical Center, Los Angeles, CA, has been selected to serve as the new Editorial Board Resident Fellow for the coming year. Dr. Toy received his DO from the Western University of Health Sciences, Pomona, CA. Laura A. Dean, MD, of Harvard-Affiliated Emergency Medicine Residency, Boston, MA, is the immediate past Resident Fellow for the journal. Dr. Dean began her term in October 2020. Her service concluded in October 2021.

If you have an idea, an issue, or an experience about which you would like to write, submit an abstract (limit 250 words, double-spaced) through *Annals'* online submission system, Editorial Manager, at www.editorialmanager.com/annemergmed (use the "Residents' Perspective" article type). If your abstract is approved, you will be asked to write the full-length article for the "Residents' Perspective" section. If you have any other questions for Dr. Toy, contact him at annalsfellow@acep.org. ★

Marianne Gausche-Hill Elected President of ABEM

Marianne Gausche-Hill, MD, has been elected President of the American Board of Emergency Medicine (ABEM).

Dr. Gausche-Hill has been a member of the Board of Directors since July 2014. She has served ABEM in a number of capacities, including as oral examiner and item writer; editor for MyEMCert; ABEM appointee to the Pediatric Emergency Medicine Subboard, for which she served as chair from 1999 to 2001; chair to ABEM and American Board of Pediatrics Committee for Self-Assessment; member of the ABEM EMS Examination Task Force and EMS Examination Committee; and current ABEM liaison to the EMS Subboard. "I am excited to lead the American Board of Emergency Medicine as the organization continues to innovate in initial and continuing certification while ensuring the highest standards in emergency medicine," said Dr. Gausche-Hill.

- Mary Nan S. Mallory, MD, MBA, Immediate-Past-President
- Samuel M. Keim, MD, MS, President-Elect
- Ramon W. Johnson, MD, MBA, Secretary Treasurer
- Diane L. Gorgas, MD, Member-at-Large
- James D. Thomas, MD, Member-at-Large



Pictured left to right: **Mary Nan S. Mallory, MD, MBA**; **Samuel M. Keim, MD, MS**; **Ramon W. Johnson, MD, MS**; **Diane L. Gorgas, MD**; and **James D. Thomas, MD**.

All ABEM physician directors are clinically active emergency physicians. ★

PALS Requirement Dropped

Emergency physicians working in American College of Surgeons (ACS) Pediatric Surgery Centers no longer have a Pediatric Advanced Life Support (PALS) certification requirement.

This is the result of the ACS removing the requirement from the recently published **2021 Optimal Resources for Children's Surgical Care**. Last year, the Emergency Medicine (EM) community partnered together across all EM organizations (Coalition on Medical Merit Badges) and requested that the ACS remove the PALS requirement for physicians certified by ABEM or the American Osteopathic Board of Emergency Medicine (AOBEM), as their initial and continuing certification processes include robust, ongoing physician assessment in the practice of pediatric emergency care. ★

ECG Challenge

W. Brandon White, DO

Emergency Medicine & Internal Medicine
PGY 5
ChristianaCare

Jeremy Berberian, MD

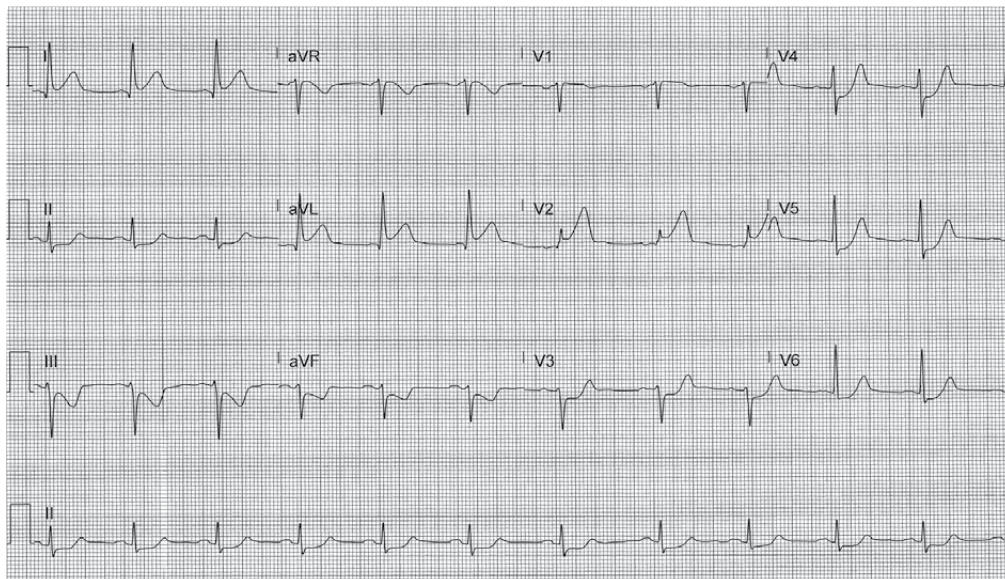
Associate Director of Emergency Medicine Resident Education
Dept. of Emergency Medicine, Christiana Care Health System
@jgberberian

CASE.

A 61-year-old male with past medical history of hypertension and hyperlipidemia presents to the emergency department with 8/10 substernal chest pain.

What is your interpretation of his ECG?

See the **ANSWER** on page 50



Introducing the 2021-2022 EMF/EMRA Resident Grantees



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LAC and USC Medical Center

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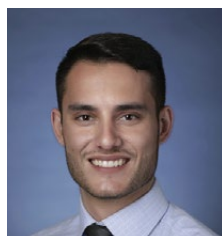


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ECG Challenge

This ECG shows an irregular narrow-complex bradycardia with an average ventricular rate of 48 bpm, a regular atrial rate of 86 bpm, normal axis, variable PR intervals, and normal QTc interval.

The pattern of STE and STD in this ECG is consistent with a high lateral MI. This pattern is sometimes called the South African Flag sign because the leads that show STE (leads I, aVL, and V2) and STD (lead III) fit into the central green coloration of the South African flag (see **Figure 1**).

STEMI is defined as new, or presumed new, STE in ≥ 2 anatomically contiguous leads in patients with suspected ACS. The ST-segment should be measured at the J-point and compared to the isoelectric baseline.

In patients with a stable baseline, the TP segment should be used.¹ Otherwise, the onset of the QRS complex should be used¹

(see **Figures 2 and 3**). Note that the presence of reciprocal STD supports, but is not required for, the diagnosis of STEMI.

The high lateral MI is an established ischemic pattern with the culprit lesion typically in the first diagonal branch of the LAD.^{2,3} The ECG seen with a high lateral MI can often show subtle STE in lead I that does not meet the AHA/ACC STEMI criteria, so it is important to recognize that STE in leads aVL and V2 with STD in lead III (and often aVF) is consistent with an occlusion of the 1st diagonal artery even though it does not meet traditional STEMI criteria since lead V2 is not considered contiguous with lead aVL.^{4,5}

FIGURE 1. The South African Flag Sign: The green coloration of the South African flag overlays the leads that show STE (leads I, aVL, and V2) and STD (lead III) seen in a high lateral MI



FIGURE 2. Measure STE from the TP segment if the TP segment is isoelectric (ie, horizontal)

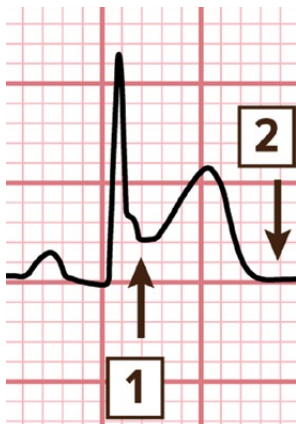


FIGURE 3. Measure STE from onset of the QRS complex if the TP segment is not isoelectric (ie, not horizontal)



STEMI Learning Points

- STEMI is defined by new, or presumed new, STE at the J point in ≥ 2 anatomically contiguous leads in the absence of LVH by voltage pattern, LBBB, or ventricular paced rhythm
 - ≥ 2.5 mm in men < 40 years old and ≥ 2 mm in men ≥ 40 years old in leads V2-V3 (or an increase of ≥ 1 mm when compared to baseline ECG)
 - ≥ 1.5 mm in women in leads V2-V3 (or an increase of ≥ 1 mm when compared to baseline ECG)
 - ≥ 1 mm in all other leads
- ST-segment is measured from the isoelectric baseline, typically the TP segment
- Reciprocal STD are not required for the diagnosis of STEMI, but their presence does increase the likelihood of the diagnosis of STEMI
- New LBBB is no longer considered a STEMI equivalent
- Significant STE that does not meet the traditional distribution (ie, ≥ 2 anatomically contiguous leads) or STE that does not meet amplitude criteria in a presentation concerning for ACS may still represent coronary artery occlusion and warrant consideration for emergent coronary reperfusion

Case Conclusion

This patient underwent emergent coronary angiography, which showed a 100% occlusion of the 1st diagonal artery and a 90% occlusion of the mid LAD; both occlusions were successfully treated with stent placement. ★

Board Review Questions

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- 1. A 73-year-old man presents with tightness in his chest after eating a pulled pork sandwich. He is unable to tolerate liquid by mouth; anything ingested is almost immediately regurgitated. An ECG is normal. What is the most effective management for this condition?**
 - A. Esophagogastroduodenoscopy
 - B. Glucagon 1 to 2 mg IV
 - C. Ingestion of an effervescent beverage
 - D. Papain PO
- 2. A 45-year-old man presents with multiple episodes of bloody stool over the past 2 hours. His medical history includes hepatitis C with ascites, alcohol dependency, and a recent endoscopy showing peptic ulcers. His vital signs are BP 66/45, P 134, R 24, and T 36.6°C (97.9°F); SpO₂ is 93%. The physical examination is notable for a nontender, distended, and firm abdomen and melena. After starting resuscitation with intravenous fluids and blood, what is the most appropriate pharmacotherapy?**
 - A. Dopamine and ceftriaxone
 - B. Norepinephrine and octreotide
 - C. Octreotide and ceftriaxone
 - D. Pantoprazole and ciprofloxacin
- 3. Which patient requires immediate postexposure prophylaxis for rabies?**
 - A. Farmer who was bitten on the hand by their horse
 - B. Teenager who was bitten on the leg by a neighbor's dog
 - C. Toddler who woke up in the same room as a bat
 - D. Woman who had contact with a raccoon but no injury
- 4. Which finding is most accurate for confirming rupture of the amniotic sac?**
 - A. Crystallization of fluid on microscopic examination
 - B. Fluid turning brown when flamed
 - C. Nitrazine strip turning blue
 - D. Pooling of fluid in the vaginal vault
- 5. In which scenario is succinylcholine a safe alternative to rocuronium?**
 - A. Amyotrophic lateral sclerosis
 - B. History of malignant hyperthermia
 - C. Known cocaine use 30 minutes before arrival
 - D. Left-sided weakness for the past 2 hours ★

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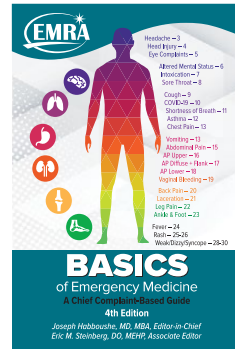
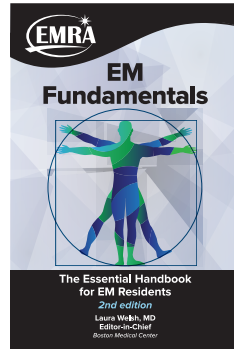
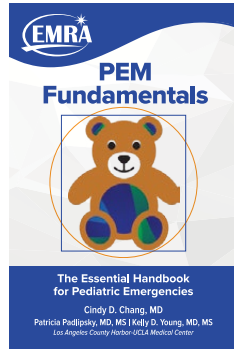
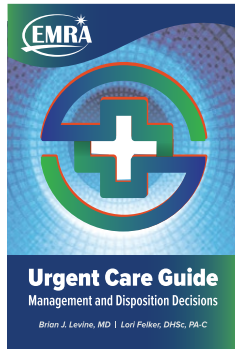
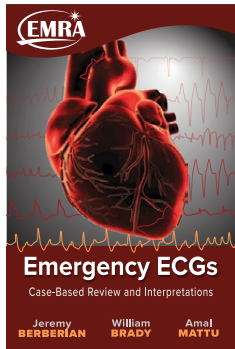
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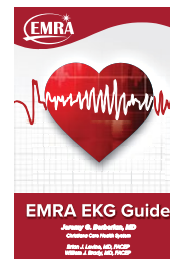
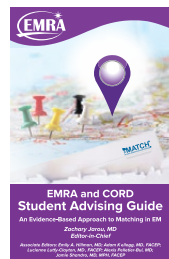
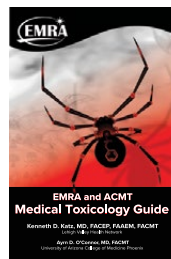
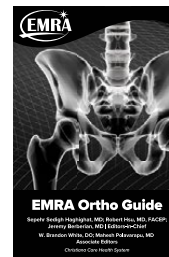
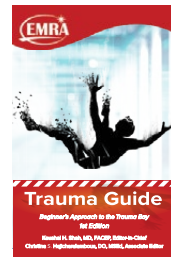
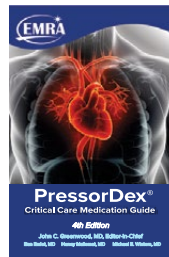
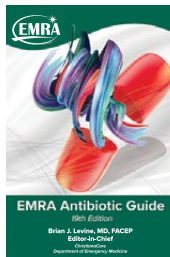
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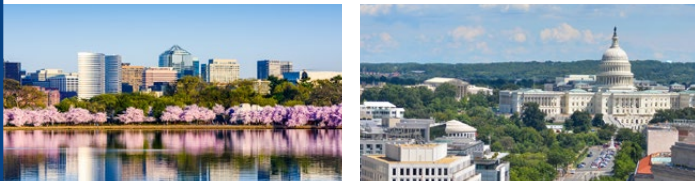
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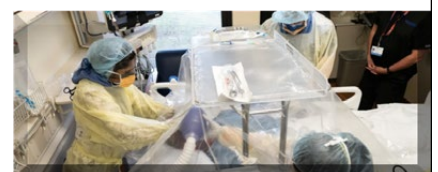
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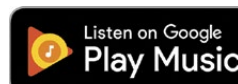
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