

The Fast Track

Winter 2017 Issue

An Emergency Medicine Publication

CURING THE
OVERCROWDING
EPIDEMIC
WITHIN
THE ED

MAKING CHAOS
MANAGEABLE
HOW TO
TRIAGE

ACOEP'S 2016
SCIENTIFIC
ASSEMBLY



The Fast Track

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Letter from the Editor

As one of the new editors for *The Fast Track*, I have the opportunity to introduce the winter edition to all of our readers. So first off—welcome! I hope we saw a majority of you at the Scientific Assembly in November, but if not, I hope to see you all at the upcoming Spring Seminar.

After ACOEP student elections were finalized, Publications co-chair Christina Powell and I were immediately thrown into the fire. Within the first week, we had our first draft deadline to meet, and it was terrifying. On top of that, I was coming up on the end of my general surgery rotation, trying to study for my exam after long hours in the OR, and managing my patients in between cases. For the first time since finishing Level 1 in July, I truly felt overwhelmed. How many more nights could I survive on a pot of coffee and four hours of sleep? How much more could I practice tying knots, with lectures going on in the background?

I did all of the things you're 'supposed' to do when you get stressed out: I reached out to my friends, spent time in the gym, ate healthy, tried to catch up on sleep, etc. None of those things improved my emotional state. So I kept telling myself to just get through it. *Just put your head down and get through the next few weeks. You'll be fine.* How often have we told ourselves those words over the past few years?

One morning during rounds, everything calmed down for me. It is amazing how one patient and their outlook on a situation can force a hard turn in the opinion of your own state of affairs. This particular patient wasn't doing very well, and yet he was still cracking jokes, poking fun at himself and our team, and doing his best to keep his family's spirits up. I remember thinking to myself, "how bad is anything I have going on?" And more importantly, I refocused myself on studying as much as I could, so that one day when a similar patient arrives at my emergency department, I know exactly what I need to do.

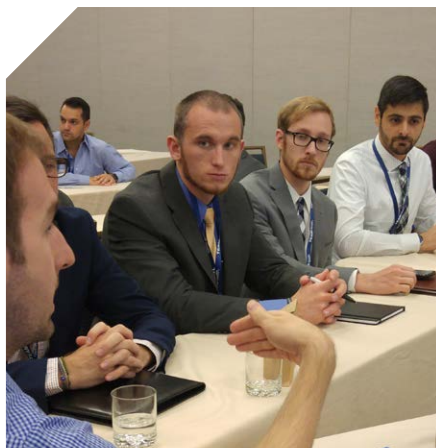
I'm not the only student who has had a revelation like this because of a patient encounter. It's pretty easy to lose your way and burn out during medical school or residency. Sometimes it feels like no matter how many "right" things you do, things just keep looking worse. For any student or resident who is going through a similar struggle right now, I urge you to find your patient, and remember why you are pursuing a career in medicine. This wasn't the first time I've felt burnt out, and I'm sure it won't be the last. The most important thing for me was to take a step back and look at the big picture again.

Over the next few months, I encourage you to make time for yourself and your loved ones as you continue on the journey to becoming a physician. Remember that you are you, first and foremost, and that your career does not define you. Do something you enjoy every day, and remember that the best way to care for your patients is to make sure that you are taken care of *first*.

Hala Ashraf
VCOM, OMS-III
SC Publications Co-Chair

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INTERESTED IN CONTRIBUTING?
Let us know: FastTrack@ACOEP.org

PRESIDENTIAL MESSAGE

Resident Chapter

Happy New Year from your Resident Chapter Officers! We hope you were able to escape the hospital for some quality time with your family and friends this holiday season!

We are very excited to announce the new Resident and Student Organization. This is an exciting time for the resident and student leadership as we continue to strengthen our partnership and transition to becoming one organization. The residents and students have always had similar goals and events; however, by working together as one, we hope to streamline our processes while continuing to provide you with the best opportunities possible.

We hope that this year you choose to make getting involved with the ACOEP one of your New Year's resolutions! With so many different avenues, you are sure to find something you are passionate about. Consider writing an article for *The Fast Track*, attending a conference, participating in a case or research competition, or attending one of the Student Symposiums as a student or a resident mentor. Whatever you may choose, we can't wait to have you join our ACOEP family!

Finally, I would like to invite you to join us for ACOEP's Spring Seminar in Bonita Springs, April 17-22nd. We will offer our critical care ultrasound lab, FOEM research competitions, mini mock Oral Board Prep, targeted lectures, and a keynote speaker. We hope to see you all there this spring!

Thank you,

Kaitlin Bowers, DO
ACOEP Resident Chapter President
ACOEP Board of Directors

PRESIDENTIAL MESSAGE

Student Chapter

Welcome to another issue of *The Fast Track*! It seems only moments ago I was glancing through a copy of this magazine at the Spring Seminar in Ft. Lauderdale. Fast forward a few semesters and I'm suddenly responsible for writing to you all—what a privilege. We are excited to provide you, our future emergency medicine residents and colleagues, with information, events, and articles to encourage your pursuit of this rewarding and innovative field.

This year we will continue the past board's Regional Student Symposiums, starting with a stop in Philadelphia, PA at the Albert Einstein Emergency Medicine Residency Program on March 25th. On a similar note, ACOEP's Spring Seminar is scheduled for the 18-22nd of April 2017 and will be in stunning Bonita Springs, FL. If you have never made it to a conference before, I would highly recommend making the effort to attend.

It is an exciting time to be a student, but also a time of uncertainty; a time full of strong opinions, deeply held beliefs and passionate convictions in the world of osteopathic medicine and beyond. The AOA merger with the ACGME is rolling forward. Many students I speak with are still unsure of what exactly the post-merger world will look like. How many years will my training program now last? What exactly does osteopathic recognition even look like? What boards will I take? How does this affect my chances of matching? Many of these questions have yet to be answered. What we know for certain is that people will continue to pour through the doors of emergency departments throughout the nation. Patients of all backgrounds and ethnicities, experiencing the worst day of their lives thus far; people in fear, and people simply with nowhere else to go. Emergency medicine has been, and always will be, a champion of flexibility. Whatever the circumstances, we will adapt and overcome as a profession for the good of our patients.

My role as President this year, and the role of this new Student Chapter Board, is to help provide materials and guidance to the osteopathic student body pursuing a career in emergency medicine. If there's an area you'd like us to investigate or explain, please don't hesitate to contact us. One of the great aspects of ACOEP is the extensive support the parent chapter and the resident chapter bestow upon us as students. More than just finances or resources, they are true leaders in emergency medicine, looking to mentor us, and to set us on our way equipped with the knowledge needed to navigate the system.

All the best, here's to an excellent 2017,

Dominic Williams, OMS-III
ACOEP Student Chapter President
ACOEP Board of Directors

ACOEP'S 2016 SCIENTIFIC ASSEMBLY

UNION SQUARE HILTON HOTEL,
SAN FRANCISCO, CA

NOVEMBER 1ST-4TH, 2016

Katherine Haddad,
OMS-III, LMU-DCOM

As the colors of leaves went from green to golden, another fun-filled fall ACOEP Scientific Assembly is in the books! This year, hundreds of emergency medicine hopefuls arrived in San Francisco, CA via planes, Ubers, and cable cars hoping to gain some insight into the field and meet fellow students and leaders. A year in the making, conference co-chair Ashley Griswold and the rest of the student board hoped to make this year the best ever! Assembling lab vendors, lecturers, residency directors, nighttime social events, while also ensuring access to morning coffee would be paramount to its success.

Step 1: Labs

The airway lab kicked off the student chapter events. With the help of our ACOEP Resident Chapter, airway device vendors, and sponsor Leading Edge Medical Associates, we were able to host an interactive airway lab. For many first and second year students, interactive student labs are the only time they are exposed to airway equipment, and we were excited to share this opportunity with them! Students rotated through multiple airway stations, practicing their skills on both adult and pediatric mannequins. Some airway tools included traditional Mac and Miller blades, while other stations included camera-assisted intubation devices. No mannequins were harmed in the making of this airway lab; although, they were found without limbs.

Step 2: Lecturers

For those students locked away in their study cubicles, staying up-to-date on the most pressing matters in healthcare can be difficult. We were fortunate to have Dr. Joe Manchester of St. Joseph Regional Medical Center shed light on the opiate abuse epidemic and instruct students on alternatives to opiates in managing our patients' pain.

Keeping on the topic of consequences to medications, Dr. Elizabeth Gignac, Program Director of Southeastern Regional Medical Center, gave a lecture on toxicology and how to approach the poisoned patient in the emergency department.





Emergency medicine physicians must be able to assess and treat patients presenting with a stroke. Dr. Bradley Chappell, ED Administration Fellowship Director at UCLA, presented how to approach transient ischemic attacks and strokes. He also discussed how to break down the literature on various treatment modalities in use today.

Dr. Bob Culley, an ACOEP student board alumnus and current PGY-2 at Adena Health System, gave a rousing lecture on mass casualty and disaster triage. Rewarding brave students who could answer his quiz questions with a crisp one-dollar bill, he discussed the roles of an EM physician in the field and the ED when disaster strikes.

Do you know your ABC's? Dr. Megan Stobart-Gallagher, Assistant program director at Einstein Medical Center Philadelphia, taught us the ABC's of trauma—so easy a toddler can do it! Starting with the primary survey, she discussed signs of trauma and what interventions are necessary given various patient presentations.



Thursday ushered in our residency lecture series including two lectures on how to navigate audition season and residency applications. Dr. Michelino Mancini, Program Director of Lakeland Health EM residency program, gave a lecture on what NOT to do on your emergency medicine rotation as well as insight on what a Standard Letter Of Evaluation (SLOE) contains.

Leigh E. Hylkema, Emergency Medicine Residency Manager at OU-HCOM Doctor's Hospital, provided students information about the residency application process including scheduling audition rotations, applying to programs, scheduling interviews, and how to prepare for the interview.

We would like to thank all of our amazing lecturers from ACOEP for their contributions to our conference. Their willingness to offer their time and energy to our students demonstrates passion and dedication to education!

Step 3: Residency Directors

Our residency programming launched with a “speed-dating” luncheon. Instead of looking for a romantic pairing, students were hoping to make a different kind of connection with representatives from eleven residency programs. During this popular event, representatives had a designated time to present their program until the buzzer sent them to another group of students. This rotation went on until the end of lunchtime, but we hope they were able to make a lasting impression!

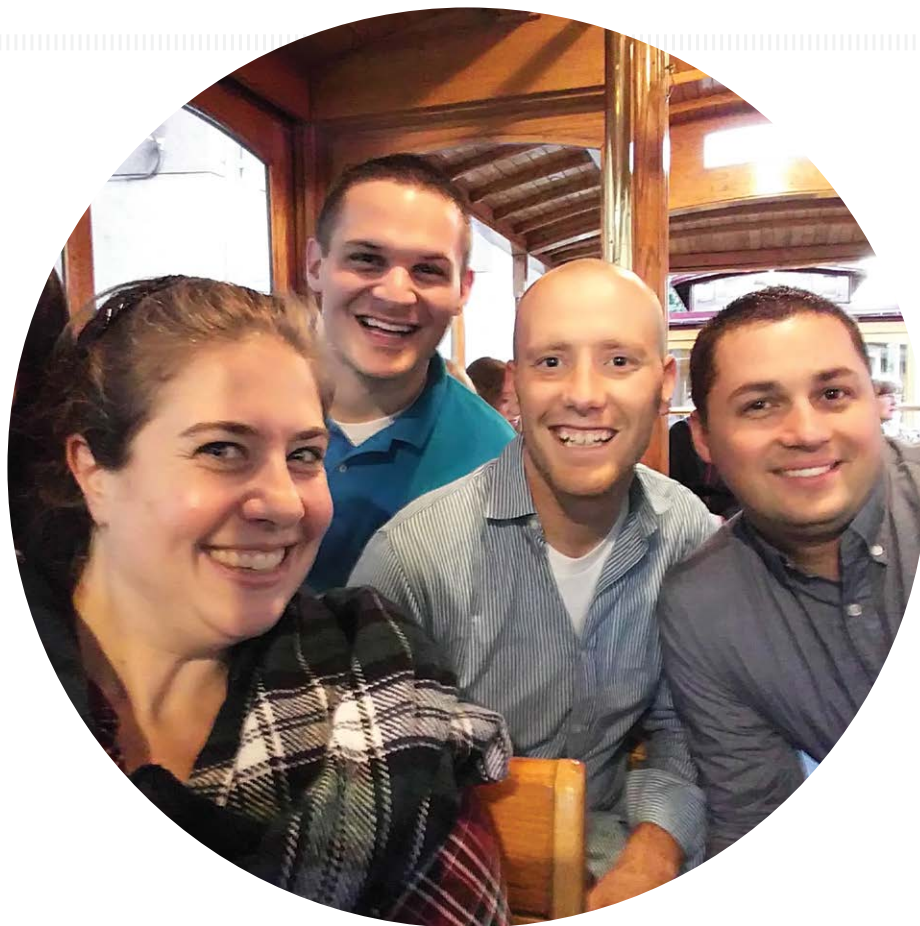
With the efforts of our GME Chair Jarryd Reed we were able to host a tremendous Residency Expo, inviting 33 programs from across the country. Students eagerly perused the expo, gaining insight into each program and meeting residency directors, coordinators, and residents alike. This event always provides great face-time and plenty of swag to pack into carry-ons for the trip home. With the single-accreditation, this event held even more importance for fourth year students deciding on which match they would be participating in this year.

Step 4: Social Events

One of the highlights of the conference included the ACOEP Kickoff Party at AT&T Park, home of the San Francisco Giants. Taking in the sights of the San Francisco Bay, conference attendees viewed the enthralling Game 7 of the World Series on the jumbotron while having ballpark fare. Regardless of rooting interest, a truly awesome moment was watching Dr. Mark Mitchell, ACOEP past-president and die hard Cubs fan, go bonkers when the Cubs won the game! The fun didn't stop there, as TeamHealth hosted an after-party at MoMo's American Bar and Grill. The following evening, US Acute Care Solutions sponsored a fun-filled social at Jillian's for residents and students. These events provided a great opportunity to bond with our colleagues at ACOEP!

BONUS: Leadership Academy

The goal for many students in attending these conferences is to begin their careers as leaders in emergency medicine. On the closing day of the student chapter conference, select



students who pre-registered were afforded the opportunity to participate in a leadership workshop sponsored by VitalSmarts. This organization seeks to improve leadership development at the corporate level, working with large institutions such as The Mayo Clinic and Google. Specifically, the students were enrolled in an abbreviated Crucial Conversations workshop, a course that teaches skills on how to create dialogue and agreement around high-stakes or risky topics.¹ As future emergency medicine physicians, being able to effectively communicate in high-tension moments is essential and this workshop proved to be a valuable experience!

Successfully completing a multi-day conference, with over 250 student attendees, involves the efforts of ACOEP physicians, residents, educators, and board members. Our student board appreciates all of their hard work and dedication. Furthermore, we would like to thank each student who attended this past conference in San Francisco. We hope every student gained some inspiration, knowledge, and guidance as they aspire to become well-informed osteopathic emergency physicians. See you at the next conference!



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CURING THE OVERCROWDING EPIDEMIC WITHIN THE ED



Frank Wheeler, OMS-III
LECOM Bradenton

An epidemic is reaching emergency departments throughout the country—an epidemic in which waiting times for emergency rooms have become increasingly prolonged, ED visits have become more expensive, and patients who are seriously ill are not able to receive treatment.¹ Although numerous reasons for this epidemic exist, one important reason can be attributed to the number of patients who present to emergency room with non-emergent medical conditions.

A cross-sectional study indicated one in four people say they have visited the ED in the past year alone.² Other studies indicated that from 1995 to 2005 the number of annual ED visits had grown 34% while the number

of emergency departments available decreased by 11%, indicating that there are more patients than emergency departments available.³ It is no surprise that as many as 50% of emergency departments admit to operating above

capacity the majority of the time.⁴ Many studies, including one conducted in San Diego, indicated that between 2004 and 2014, emergency department visits increased by 40%, while more than half of these visits were for non-emergent conditions.⁵ The author of the article went on to state that "too few people understand when to use emergency services and many don't have primary care doctors they can visit and this in turn, puts more strain on the ED."⁵

Overcrowding is becoming an important issue because it is a threat to public health and safety. Numerous reports link overcrowding to delays in diagnosis and treatment, decreased quality of care, and poor patient outcomes.⁶ These delays in diagnosis and treatment were found to be with time sensitive conditions such as acute myocardial infarction, acute stroke, acute surgical emergencies, and severe sepsis.⁶

Another important effect of overcrowding is the financial consequence. According to the New England Healthcare Institute, 38 billion dollars are wasted each year due to ED overuse.⁷ Overcrowding also leads to ambulance diversion. When EDs are overcrowded, ambulances are diverted to other hospitals even if they are bypassing the closest facility. This has become so severe in some urban areas, that EDs may be bypassed as often as 50% of the time.⁸ This is important because patients with life-threatening conditions may have to wait to receive life-saving treatment and may attain a poorer prognosis. It is estimated that over a thousand dollars is lost each hour ambulance diversion is occurring.⁴

NUMEROUS REPORTS LINK OVERCROWDING TO DELAYS IN DIAGNOSIS AND TREATMENT, DECREASED QUALITY OF CARE, AND POOR PATIENT OUTCOMES.

Overcrowding is a complex issue and the reasons for it are multifactorial. One such reason is the lack of inpatient beds, a situation known as "boarding." This is an instance when a patient remains in the ED after the decision to admit or transfer has been made. Although the average boarding time for a patient is over three hours, in an overcrowded ED this waiting time may be doubled.⁴ Thus slowing down patients trying to get into the ED, those currently being treated, and those waiting to be discharged. In a study conducted by the *Annals of Emergency Medicine*, over \$10,000 revenue is lost each hour due to boarding. Needless

to say, many hospitals are looking to streamline this disposition-to-admission process in order to create a more efficient and accessible emergency department.

Many patients also seek treatment in an ED due to their inability to attain a primary care provider. According to the CDC, in one study conducted in 2011, 79.7% of adults visited the ED due to lack of access to other providers.⁹ This is not surprising considering the consistent lowering of Medicare and Medicaid reimbursements over recent years. Many physicians cannot afford to accept patients from such government programs and those patients are left without necessary medical care. This issue may continue to worsen in the future with estimates that by 2020, the U.S. faces a shortage of more than 450,000 primary care physicians.⁴

Following the Emergency Medical Treatment and Active Labor Act of 1984, the ED is the only healthcare department that must continue to see patients without regard to ability to pay.¹⁰ The ED has become the only guaranteed access to healthcare for the 28.5 million Americans who are still uninsured.¹¹

With overcrowding being such a complex issue, approaches to fixing it need to be multifaceted and address the many underlying reasons for its occurrence. One logical approach would be to increase access to primary care services. This can be done in the form of increasing Medicare and Medicaid reimbursements, granting larger government subsidies to allow more Americans to become insured, or simply extend primary care offices to extend their hours and allow for same-day appointments. One study found that by simply

extending primary care centers office hours, ED visits can be reduced by 8%.⁷

Research suggests that many individuals go to the ED because of their primary care provider's

answering service. In response, many insurance companies have started offering 24-hour hotlines with a medical professional to limit unnecessary ED visits. One study involved patients calling a hotline before going to ED, reduced unnecessary visits from 41% to 8%.¹² A recent extension from the hotline approach has been the utilization of computer consultations with a provider. Studies have shown that up to 28% of ED visits could have been managed with computer consultation.¹³

Additional approaches have addressed meeting needs of certain patient populations. One study addressed the

homeless population in Chicago, where a coordinator was set up to assist the patients in attaining housing. This was found to decrease ED visits by 24%.¹⁴ Other patient populations that frequently present to the emergency room could be targeted as well.

Another effective approach to decreasing unnecessary ED visits is the formation of urgent care clinics throughout the community. These services would allow patients to receive care for non-life threatening conditions. One study found that urgent care offices reduced unnecessary ED visits by 48%.¹⁵

Lastly, one very effective approach to address overcrowding can be increasing patient education. Many patients have limited medical knowledge and simply need more resources in regards to their conditions, how to manage them, and whether their condition warrants a trip to the emergency department. Any online resources such as Healthline.gov provide instruction for whether or not to seek care within an emergency department. While reducing unnecessary ED visits, patient education also empowers them to take responsibility of their health and make informed decisions about their care.

MANY PATIENTS HAVE LIMITED MEDICAL KNOWLEDGE AND SIMPLY NEED MORE RESOURCES IN REGARDS TO THEIR CONDITIONS, HOW TO MANAGE THEM, AND WHETHER THEIR CONDITION WARRANTS A TRIP TO THE EMERGENCY DEPARTMENT.

In conclusion, emergency department visits over the past 10 years have increased while the number of EDs available have decreased. Many of these visits are patients with non-urgent medical conditions that do not require the level of care that can be provided within an emergency department. Overcrowding is a threat to public health and safety and many approaches have been found to be effective in decreasing unnecessary ED use. Strategies to combat overcrowding include increasing access to primary care access, telephone and computer consultations, increasing urgent care providers, and improving patient education. With these approaches, the medical community can create safer emergency departments that protect patients and provide the kind of care patients need—life-saving care.

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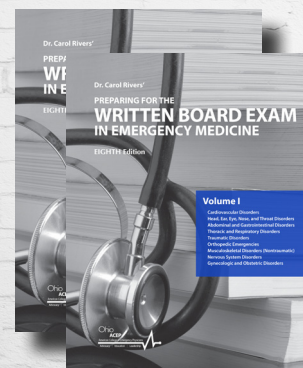


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MAKING CHAOS MANAGEABLE

How to Triage

Christina Powell, OMS-II
ENS, USN, MC
LECOM-Bradenton

"TRIAGE IS AN ATTEMPT TO IMPOSE ORDER DURING CHAOS AND MAKE AN INITIALLY OVERWHELMING SITUATION MANAGEABLE."¹

As medical students, and as future emergency medicine physicians, learning how to triage is an invaluable skill. The student who thrives within an environment of overwhelming stimulus, and is able to compartmentalize each event and prioritize their importance, will survive in emergency medicine. Some of us function optimally under chaos, and the life skill of triage appears to be inherent. However, the triage of a mass casualty incident (MCI) or disaster scenario requires instruction and uniformity. When resources are limited and you are faced with a plethora of injuries, which patient do you aid first? The decision to withhold care is difficult for any physician; however, the ultimate goal of triage is the greater good: to return the greatest number of patients to health and safety with the available resources at hand.

A fully occupied ferry boat just crashed along the banks of Elliot Bay in Seattle.

If you're thinking of Grey's Anatomy, we're on the same page. The Coast Guard has been called out, and divers are actively pulling passengers from the water. The hospital gets called for assistance, and you ride along in the ambulance toward the scene. Upon arrival, you and the EMS unit are the first to arrive. What do you do?

Three Main Priorities:

1. Scene Assessment
2. Patient Evaluation
3. Triage

1. SCENE ASSESSMENT

Evaluating a scene begins long before you arrive, and usually begins with evaluating for safety. Assessment is initiated while en route, based on the information provided by the dispatcher.² Over a six year period, from 1992 to 1997, 114 EMS fatalities were reported in several national databases, 74% of which involved motor vehicle accidents.³ While most fatalities involved collisions between ambulances and vehicles, almost half were associated with ground-vehicle crashes or pedestrian fatalities.³

Your safety is paramount. With the incapacitation or untimely death of one medical provider, how many patients would be lost as a consequence? In addition to the EMS personnel, the patients themselves need to be in a safe area before assessment and treatment can begin.

Threatening conditions:

- Fire
- Downed electrical lines
- Explosives
- Toxic exposures
- Blood pathogens
- Traffic
- Assaultants

In our example of the Seattle scenario, assessing for traffic and weather conditions (e.g. snow, ice, fog, rain) would be key to ensuring a safe environment. Police and firefighters can share



in the responsibility here. Establish an isolated safe area for triage to begin.

2. PATIENT EVALUATION

Patient evaluation and prioritization involves assessing the severity of injuries. Does the condition (a) result in loss of life, (b) result in loss of limb, or (c) neither?² The primary survey of a patient must be quick and thorough, minimizing time in the field with each patient. If you have been to a previous ACOEP student conference, recall your ABCs. In situations where trauma is being evaluated, the ABCs can be modified per Advanced Trauma Life Support (ATLS) curriculum to include disability and exposure/environment.⁷ Be sure to evaluate each individual patient in the same manner upon initial assessment.

A - Airway management and cervical spine stabilization

Is the airway patent with no obstruction?

Suspect spinal cord injury until conclusively ruled out.

B - Breathing (Ventilation)

Is the patient breathing? Are they hypoxic or cyanotic?

Assess the quality of the respirations. Evaluate ventilatory depth as well as rate.²

C - Circulation (Hemorrhage and Perfusion)

Is external or internal hemorrhage suspected?

Check pulse, skin color, temperature, moisture, and capillary refill time.

D - Disability or neurologic status

Assess patient's level of consciousness.

Use the Glasgow Coma Scale to assess for level of consciousness.⁴

E - Exposure/environment

Expose/disrobe the patient to assess for injury.

Be mindful of hypothermia and weather conditions.

The secondary survey is the head-to-toe assessment of the patient that looks for other non-life-threatening ailments. In an initial assessment of a patient in a mass casualty scenario, the secondary survey will not be a priority. When time is of the essence, only life threatening issues take priority. Be mindful to not proceed with the secondary survey until all elements of the primary survey have been addressed and stabilized, if indicated.

What is the Golden Hour?

R. Adams Cowley, MD developed the concept of the "Golden Hour" of trauma, now called the "Golden Period."² If bleeding is uncontrolled and inadequate perfusion occurs, morbidity and mortality increase. From his experience, Dr. Cowley observed that if bleeding and perfusion are not resolved within 60 minutes of injury, the chance of survival plummets. Some patients need less than one hour to receive definitive care, while others have more time; however, the general idea centers around the providers' responsibility to assess the patient and provide definitive care in a timely matter.

3. TRIAGE

Classify the situation: is it a multiple-patient incident, like a three car pile-up, or a mass casualty incident?² MCIs occur when the number of patients exceed the available resources. Ergo, it's time to "sort," in the essence of the French derived word: triage.⁵

Multiple algorithms have been developed to help care providers efficiently triage. START (Simple Triage and Rapid Treatment) was developed by Hoag Hospital and the Newport Beach Fire Department (Newport Beach, CA) as one of the first civilian triage systems. It was later adopted as the disaster triage standard by the International Recovery Platform (IRP).⁶ Under the START protocol, it takes 30-60 seconds to triage each

patient. The START triage algorithm is featured in Figure 1 and a START triage prompt is depicted in Table 1.

START CATEGORIES

GREEN (MINOR) – Think: abrasions

The “walking wounded”² can care for themselves or can be aided by nonmedical personnel. Injuries include minor burns, lacerations, abrasions, and fractures of small bones. Tell the crowd to walk over to a designated area. Anyone who can walk, breathe, and is responding, will be able move to that area, leaving a smaller group to be triaged. You have just selected for the most injured.

YELLOW (DELAYED) – Think: long-bone fracture

‘Delayed’ patients have debilitating injuries that are not emergent. They do not require immediate medical attention to salvage their life or limb.² Injuries in this category include: large muscle wounds, intra-abdominal wounds, or burns less than 50% of total body surface area (TBSA). Treatment such as IV fluids, splinting, antibiotics, pain relief, catheterization, or gastric decompression¹ will be required eventually.

RED (IMMEDIATE) – Think: external hemorrhage

‘Immediate’ patients have a critical injury that will take minimal time or equipment to manage. Chances of survival

are high with minimal intervention (e.g., respiratory obstruction, chest or abdominal injuries, or emergency amputation).¹

BLACK (DEAD) – No pulse, no breaths and unresponsive.

Additional category not included in START:

Expectant – Think: unresponsive with penetrating head wound

‘Expectant’ patients have severe injuries with poor prognosis. For these patients, even if they receive optimal medical resource application, their survival would be unlikely.¹ Provide comfort measures for these patients (e.g. explosive wounds involving many organs, 3rd degree burns in excess of 60% TBSA and shock with multiple injuries).¹

| | | |
|---|--------|--|
| R | 30 | Respiratory rate fewer than 30 per minute. |
| P | 2 | Perfusion is adequate. Capillary refill less than 2 seconds. |
| M | Can Do | Mental status is adequate. Patient can do what they are asked. |

Table 1. START triage algorithm.
(Courtesy of Newport Beach Fire Department, Newport Beach, CA)

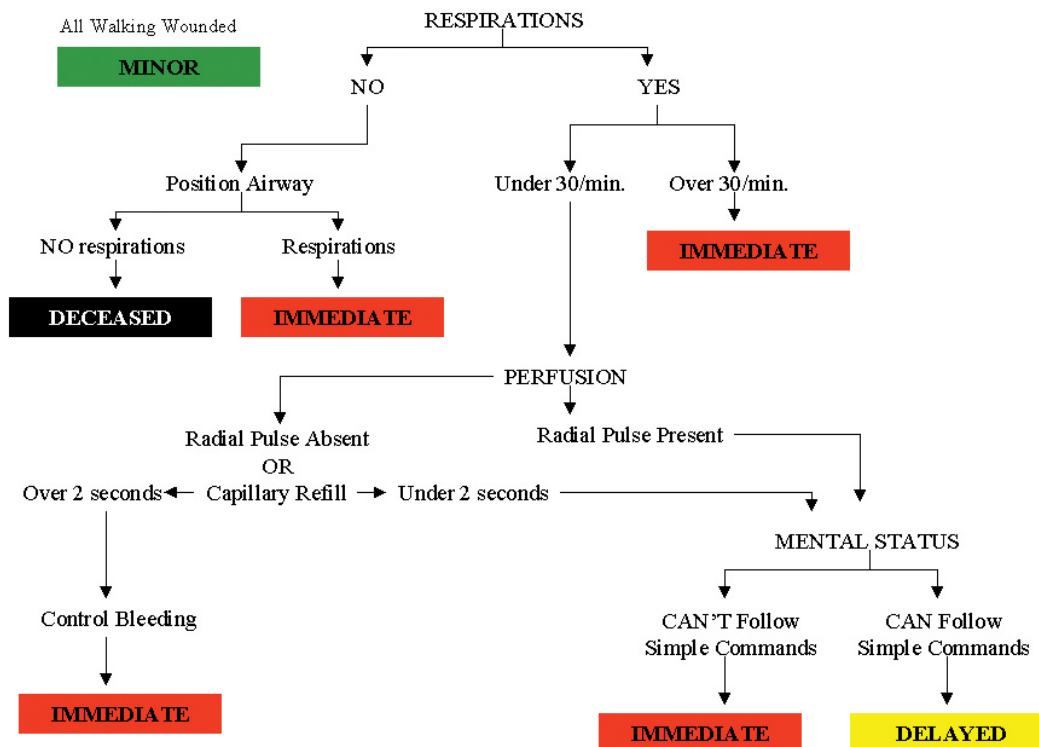


Figure 1. START triage algorithm.
(Courtesy of Newport Beach Fire Department, Newport Beach, Cal.)

The image shows two versions of the EVACU-AID TRIAGE TAG. The left version is a full form with fields for patient information, vital signs, and triage categories. The right version is a simplified version with a patient silhouette and basic triage categories.

Left Version (Full Form):

- Top: Yellow header with "Nº 615142" and "CONTAMINATION: NO YES".
- Form: Fields for Respiration, Perfusion, Mental Status, and Mark (ORIENTED, DISORIENTED, UNCONSCIOUS).
- Vital Signs: Time, Pulse, B/P, Respiration.
- Major Injuries: Destination.
- Bottom: Triage categories: DECEASED (black), IMMEDIATE (red), DELAYED (yellow), MINOR (green).

Right Version (Simplified Form):

- Top: Yellow header with "Nº 615142" and "CONTAMINATION: NO YES".
- Form: Fields for Name, Address, City, State, Zip, Phone, and Weight.
- Bottom: Triage categories: DECEASED (black), IMMEDIATE (red), DELAYED (yellow), MINOR (green).

Figure 2. Triage Tag.

As depicted in Table 1, the protocol for quick patient assessment is referred to as "30-2-can-do". The following guidelines allow for quick classification of patients into one of the START categories. Each patient is tagged with their corresponding color for registration, and this tag is to remain with the patient throughout the patient's care (Figure 2).

If "30-2-can-do" START triage prompt met = **GREEN (MINOR)**

If "30-2-can-do" applies but they cannot walk = **YELLOW (DELAYED)**

If any one of these criteria are not met = **RED (IMMEDIATE)**

While at the patient's side, there are only a few basic lifesaving measures

you should perform.

1. Manually open airway
2. Control the bleed

It may be counterintuitive, but no cardiopulmonary resuscitation (CPR) should be attempted.²

Triage is often a difficult task. It requires us to make tough choices within a few seconds, offer minimal intervention, if any, and promptly proceed to the next patient. Efforts should not be made to resuscitate a traumatic cardiac patient with little chance of survival while four other nearby patients die because of preventable external hemorrhaging. It is the goal of triage to maximize the number of lives saved within the confines of limited resources. Also, "retriage"² may be required if

transportation has not arrived as planned. The longer the patients remain without treatment, the 'delayed' patients can quickly deteriorate to the 'immediate' category. It is important to remember that triage is dynamic, not static, and reassessment must occur as warranted.

Keep in mind that you and the EMS unit are not the only personnel overwhelmed in this scenario. Local hospitals in the area have to prepare for a large number of patients during a mass casualty situation and stock accordingly. Proper triage can help minimize the chaos for all involved. Prime time television aside, mass casualty events do occur, and hopefully you will feel more confident entering the situation methodically and with these guidelines in the back of your mind.

This topic was chosen based on one of the informative lectures at the Fall ACOEP Scientific Assembly in San Francisco this past November 2016. If you would like more information on the START method for disaster triage education, email info@start-triage.com. If you have not yet attended a conference or symposium, consider attending the upcoming Spring Seminar in Bonita Springs, FL. Attend the conferences so you can become a well-informed osteopathic medical student or resident and prepare yourself for your career in emergency medicine.

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THE BASICS OF FROSTBITE

Maureen A. Hirthler, MD
Lake Erie College of Osteopathic Medicine,
Bradenton, FL

Richard L. Hutchison, MD
Children's Mercy Hospital, Kansas City, MO.

Colder temperatures bring the threat of frostbite with them. We humans are tropical animals, and so we must protect ourselves from freezing temperatures. Unfortunately, much of our behavior—alcohol, drugs, extreme sports, mountain climbing—put us at high risk for frostbite. Environmental conditions such as wind, humidity and temperatures below 27°F can increase the chance of injury, as can smoking, diabetes, immobilization and a history of prior cold injury.

Frostbite begins with freezing of the skin. This is direct tissue damage secondary to the formation of ice crystals leading to cellular dehydration and death. However, additional damage to tissue occurs later. Thawing causes a reperfusion injury via inflammatory mediators such as histamine and bradykinins, which leads to edema and endothelial injury to surrounding tissue. As a result, it is difficult to estimate the extent of damage at the time of injury.

First degree frostbite is reversible. The skin is white with surrounding erythema. Blister formation with edema indicates second-degree frostbite. Third degree frostbite features severe edema with hemorrhagic blisters and non-perfused skin. Hard, insensate and mottled skin is a fourth-degree injury. It is most useful clinically to categorize frostbite as superficial or deep. There is little benefit to early imaging or arteriography for diagnosing the degree of injury.

The treatment of frostbite includes evaluation of and treatment for associated injuries such as trauma, hypovolemia, or hypothermia. Tetanus prophylaxis is indicated. Rapid rewarming in water 100.4°F–104°F is advised, with avoidance of refreezing and thawing cycles, which can increase the extent of damage. Rewarming can be quite painful; adequate analgesia is essential. Once the skin is pliable and reddish-purple, local care can begin.

Debridement of blisters should be considered if excellent wound care can be provided. This would include daily cleansing, protection of the wounds and dressing changes. Clinical trials of adjuvant therapies such as low molecular weight Dextran, anti-coagulation, sympathectomy and hyperbaric oxygen have not shown a significant change in outcome.

There is some evidence that thrombolytic therapy with tPA may be effective in reducing amputation rates after severe frostbite if administered within twenty-four hours of thawing.

Superficial frostbite should heal without surgical intervention. There remains controversy of the timing of surgery in deep injury. Urgent operation is needed for compartment syndrome or infection, but traditional guidelines allow the time for the tissue to fully demarcate before debridement.

Most frostbite can be avoided through proper education and preparation, but emergency medicine physicians remain a critical part of the early care of the cases that do occur.



Fig. 1. Second degree frostbite

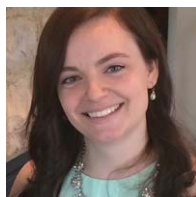


Fig. 2. Third degree frostbite



Fig. 3. Late fourth degree frostbite

Meet the 2016-2017 ACOEP Resident Chapter Board



President

My name is **Kaitlin Bowers**, and I am excited to serve as your new Resident Chapter President. I was born and raised in Columbus, Ohio. I went to undergrad at the University of Dayton and medical school at Ohio University. I am currently a PGY-2 at Doctors Hospital in Columbus, Ohio. I love spending time with my husband and our adopted goldendoodle, Sam. I am a big Cleveland Indians and Ohio State Buckeyes fan! I also really enjoy being active and lately have become obsessed with Pure Barre. I have been lucky enough to be involved with ACOEP since second year of medical school, serving in various leadership positions. I look forward to working closely with our newly elected officers to provide the resident membership with new, fresh, and innovative opportunities that make learning fun. I am also excited to team up with our student leadership to begin combining our chapters to become one Resident and Student Organization this fall!



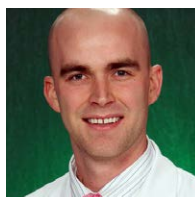
Past-President

My name is **John Downing**, a current PGY-3 from Northwestern University Chicago COM EM Program. As Past President, I am excited to provide support and guidance to our excellent leadership team. We are a diverse and experienced crew and are here to work for all of you!



Vice President

My name is **Angela Kuehn**, and I am a 2nd year resident at Aria Jefferson Health and the new Vice President of the ACOEP Resident Chapter. I am a graduate of Nova Southeastern University and the past GME chair of the ACOEP Student chapter. I am originally from Upstate, New York but have settled nicely in the Philadelphia area. I am forever grateful for the opportunities that ACOEP has provided me over the years as a medical student and now as a resident. I look forward to helping the Resident chapter grow and move forward this academic year.



Treasurer

Hi my name is **Cameron Meyer**. I am a 1st year resident at Doctors Hospital in Columbus, Ohio. I am originally from Salt Lake City, Utah and love the outdoors. I have got a smok'n hot wife and four crazy kids. I know how to use a calculator, so I feel very qualified to be your treasurer. I have been involved with the ACOEP since my first year of medical school. The ACOEP has literally changed my life and helped me to reach my lifelong goals. Through this great organization, I have met some of my best friends including board members, fellows, residents, and students. I am honored to be able to serve in this role and would love to help and serve any way I can. Do not hesitate to contact me for anything.



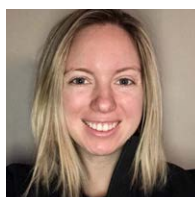
Secretary

My name is **Dhimitri Nikolla**, and I am a 2nd year resident at Saint Vincent Hospital in Erie, Pennsylvania. I originally hail from Tuxedo, New York where I continue to volunteer as an EMT. I graduated from LECOM – Erie, and last year, I was one of your Publications Committee Co-Chairs. As Secretary, I look forward to providing you another year of great content from *The Fast Track*.



GME and Research Chair

I'm **Deb Rogers**, a PGY-1 at Adena Regional Medical Center in Chillicothe Ohio, and your new GME and Research Chair! I am from East Tennessee and have been a paramedic since 2005. I found my passion for Emergency Medicine while working for a rural Rescue Squad. I enjoy spending time with my dog and husband. We all have a love for all things outdoors.



Member Services Chair

I am **Cydney Godman**, a PGY-2 at Western Reserve Hospital in Cuyahoga Falls, Ohio. I am a huge Florida Gator fan and originally from Tampa Florida, but I am surviving the Ohio winters so far. I am very interested in ultrasound, and I am currently the

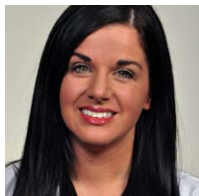
coordinator for our journal club. When I am not working, I enjoy hiking in the national forest with my husband, Craig, and our dog, Winnie. We also enjoy visiting local restaurants and going to Akron Rubber Ducks baseball games in the summer.



Conference Co-Chairs

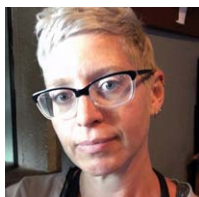
I am **Sasha Rihter** and am currently a first year resident at Ohio Valley Medical Center in Wheeling, WV. Originally, I moved to the wild and wonderful from the Wisconsin/Chicago

area for medical school and fell in love with the beautiful outdoor adventures this area has to offer. As co-chair of the conference committee for the resident ACOEP chapter, I work on putting together and organizing our bi-annual resident conference labs and lectures. If there's something/someone you'd like to see at the next conference, get in touch with either me or my awesome co-chair and we'll make it happen!



I am **Olivia Reed** and am currently a second year resident at Norman Regional Health System in Norman, Oklahoma. I was born and raised in Paris, Texas and graduated from Texas A&M University and Rocky

Vista University. Outside of work I enjoy running, rodeos, and cooking out with my family. After graduation I look to pursue a critical care medicine fellowship and participate in hospital administration. As a member of the conference committee, I look forward to promoting our spring and fall resident competitions and organizing informative and exciting resident lectures.



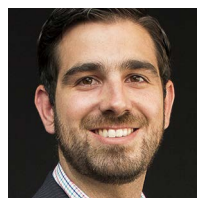
Publications Co-Chairs

My name is **Sarah Roth**, DO PGY-2. I'm one of the new Publications Committee members, and I'm looking forward to helping produce this year's editions of *The Fast Track*. I'm a

second year resident at Kingman Regional Medical Center in northwest Arizona. Prior to medical school and residency, I did graphic design and website publishing, as well as many other different jobs.

I'm married to a creative writer and English professor and hopefully I've learned a thing or two from him. Besides being passionate about emergency medicine, I have a great interest and dedication to enhancing physician wellness. I currently

write a blog about this topic and serve as my residency's representative to the Academic Life in Emergency Medicine's Wellness Think Tank. When not busy with other projects, I practice yoga, hang out with my husband and foster baby, drink coffee, and invest in my relationships.



Hello all! My name is **Alex Torres**, and I am currently a PGY 3+ (advanced standing) resident at Comanche County Memorial Hospital's Emergency Medicine residency in Lawton, Oklahoma. I am originally from Fort Lauderdale, Florida

but ultimately landed in West Virginia for medical school and internship. After medical school, I completed a traditional rotating internship at Charleston Area Medical Center in West Virginia before deciding to pursue an emergency medicine residency in southwest Oklahoma. My wife and I have been in Oklahoma for over two years and I will be graduating in December 2017. I have a strong interest in both EMS and critical care medicine, and upon completion of my residency training, I will continue my career in both civilian sector as well as the U.S. Air Force Reserve, where I am currently serving as a Captain in the Medical Corps. In my time outside of the emergency department, I enjoy traveling, particularly internationally, watching college sports, and spending time with family.



Information Technology Chair

Hello there! My name is **Henry Marr**, and I am your new Information Technology Chair. I am originally from sunny Southern California, mere minutes from Disneyland. I

did my undergrad at University of California, Berkeley, and then attended Touro University Nevada for medical school. Yep, I went to medical school in Vegas (it's hot, but it's a dry heat). Now I'm braving the cold and snow as a second-year EM resident at Good Samaritan Hospital Medical Center on Long Island. Prior to medicine, I was in research for many years doing everything from squeezing spinal cords out of chick embryos to blending breast cancer tissue into a slurry for genome sequencing. When I'm not at the hospital, I enjoy catching up on technology magazines and tinkering with computers. If I'm doing neither of those things, then I'm probably cooking. Fun fact: I once made a batch of brownies daily for 30 days in order to find the best boxed brownie mix (Duncan Hines Family Style, made using the chewy recipe). Yes, I have now graduated to making my brownies from scratch.

Meet the 2016-2017 ACOEP Student Chapter Board!



President

My name is **Dominic Williams**, and I'm the new Student Chapter President. Turns out, you don't have to provide a birth certificate for this position. I was born and raised a little ways outside

of London, England. Since moving to the United States in 2008 I began a career in emergency medicine, working first as an Emergency Medical Technician - Basic, then as a Paramedic while I took classes at the University of Central Florida. During medical school, I continued to take as many opportunities as possible to impact my local community, winning awards for community service in my first and second years, leading the local ACOEP student chapter, and sitting as a member of the Drug Free Manatee—Prescription Drug Task Force. I have also taken the opportunity to advocate nationally for our osteopathic profession as part of the Student Osteopathic Medical Association. I am currently an OMS-III at LECOM-Bradenton, completing rotations in and around the Orlando area. My wife and I have two girls, and a son on the way in February of next year. Aside from raising crazy children, my passions are soccer, music, and I'm a novice with a compound bow. I'm looking forward to meeting many of you in the upcoming year, and with the fantastic board members elected by your local chapter representatives, we should be in for a great experience.



Past president

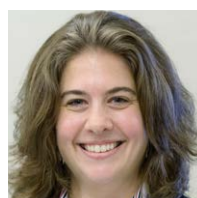
Hi my name is **Tim Bikman**. I am the ACOEP Student Chapter Immediate Past-President. I am a fourth year student from West Virginia School of Osteopathic Medicine. I was born and

raised in a small town in southeastern Idaho and spent my summers working on my family's cattle ranch. I love being active, being outdoors, and spending time with my wife and 2 year-old son.

I have truly enjoyed my time on the national ACOEP student board as we have worked diligently to address the concerns of all students interested in a career in emergency medicine. This specialty has become one of the most difficult to match into. We will continue to find innovative ways to give motivated students opportunities to enhance their resumes and build

connections so that they can one day match into the residency of their choice.

If you ever have any questions feel free to reach out to me at tbikman@osteo.wvsom.edu



Vice President

My name is **Christina Hornack**, and I'm an OMS-III at VCOM-Virginia and the new Vice President of the National Student Chapter. I have dual bachelor's degrees from the

University of Pittsburgh – a BA in Public Service, and a BS in Natural Sciences, with a certificate in Written Professional Communications. I was born and raised in Pittsburgh, Pennsylvania, but I don't know sports even a little, so I can't speak about our six super bowl rings or how our name is on the Stanley Cup several times. Before leaving corporate America to pursue my dream of becoming a doctor, I was a Technical Project Manager in the warehousing industry where I worked between stakeholders to deploy resource management systems. I have a 19 year old son who lives in Carnegie, Pennsylvania and works as an auto detailer. I am happily married to my husband of 11 years and whose guidance was invaluable during medical school as he is a microbiologist that works in Virginia Tech's Food Science Department. The two of us live in Christiansburg, Virginia with three very unruly cats named after Firefly characters. Shiny!

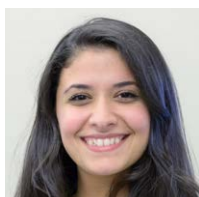


Treasurer

Hi all, my name is **Andy Leubitz**, and I am a third year at OU-HCOM. I am very excited to be serving on the board again as treasurer! I am originally from Akron, OH (just a kid from Akron) and

went to college at The Ohio State University studying biology and public health. I went to med school right after undergrad and am so happy to have found emergency medicine—finally answering the age old question, "What do I want to be when I grow up?" I recently completed my 'year off' of medicine where I finished my MBA degree at Ohio University. I became interested in the business of medicine while studying public health and attending events like DO Days on the Hill, where I

kept running into the hurdle of being passionate about public health, but I needed to understand the finance and politics, or it didn't really matter. I have to say that I am truly happy to be back in medicine. Two fun facts - First, I am part of one set of seven sets of twins in my family, and second, I love to travel—hopefully I'll make it to the Grand Canyon this year after boards—still can't believe Taylor has not been there yet.



Secretary

My name is **Katherine Haddad**, and I am a third year student at Lincoln Memorial University. I'm originally from America's High Five: Michigan! I am very excited to spend another year on the ACOEP

Student Board as Secretary. Last year, I had the privilege of being one of the Conference Co-chairs and was able to learn about the organization and how to reach out to fellow students interested in emergency medicine! My favorite things include spending time with my family and friends, shamelessly singing in my car, coffee, talking to various dogs I encounter, and being an obsessed Michigan football fan. After undergrad, I wandered my way into a scribing position in the ED, caught the emergency medicine bug, and have not recovered since. Per UpToDate, there are no known treatments, and I have since accepted my fate. Fun fact: I binge-watched all six seasons of Game of Thrones in between taking Step 1 and starting clinical rotations. I am not-so-patiently waiting for the seventh season to air.

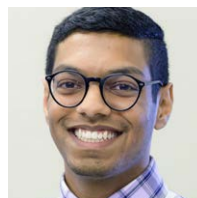


GME Chair

My name is **Jacob Schwab**, and I'm happy to be serving on the board this year. I'm from Farmington, Utah, and I come from a family of four sisters and a dog. My dog is male too, so we have

to stick together sometimes. My family is amazing, and I feel very blessed to have some pretty incredible people in my life. I'm engaged to marry my awesome fiancée, Tiana, in a few weeks, and I couldn't be happier. I grew up around the outdoors, so I love hiking, camping, water skiing, skiing, fishing, golfing, farming and just about anything else you can do outside. Fun

fact about me: when I grow up, I want to be a tee-ball coach. State champs or bust!



Research Chair

My name is **Aadil Vora**, and a lot of people call me A - Dill Pickle. Get it? I'm from the San Francisco Bay Area, but have been living in Fort Lauderdale for the past five years. I went to undergrad

at Nova Southeastern University and continued with medical school at the same place; I'm a proud Shark. SOMA has been a big part of my student life, and I am an avid advocate for the osteopathic profession. In my free time, I do lots of art, since I come from a theater and sculpture background, and I love camping and traveling with friends. Emergency medicine is the niche in medicine for me, because I love the pace, variety and surprises. The challenge of diagnosing with limitations is a thrill, see the TEDx talk I gave at school on creative limitations called "Trick Your Mind Into Being Creative." This year I will be serving on the national board as the Research Chair. Our committee works to connect the curious with each other to initiate and support research projects. Research in our residency programs is becoming a more important pillar with the ACGME/AOA Single Accreditation System, and I encourage all students in ACOEP to take part.



Constitution and Bylaws Chair

Hello, I'm **Taylor Webb**, and I'm your Constitution and Bylaws Chair for the National Student Chapter of the ACOEP. I was born and raised in warm and sunny Arizona my entire life, but

decided to head to "wild and wonderful" West Virginia for medical school. I worked as an emergency department scribe for almost four years, while I attended Arizona State University. It was there that I knew that I couldn't see myself in any other specialty than emergency medicine. An interesting (yet admittedly embarrassing) fact about me—even though I grew up in the Grand Canyon state my entire life, I still have yet to visit the natural wonder of the world. My classmates never let me live that down, but I promise I'll get there soon!



Conference Co-Chair

Hello, my name is **Rochelle Rennie**, and I am a third year medical student at Ohio University Heritage College of Osteopathic Medicine, in Athens, Ohio. I was born in Jamaica and grew up in

Newington, Connecticut, which means I'm a New Englander and yes of course a Patriots fan. I attended Boston University for undergrad where I was a cheerleader, and received my undergraduate degree in biology. Before medical school I worked in insurance and received my EMT certification. While attending OUHCOM I have been a class Secretary and was the Vice President of the Athens chapter of the Student National Medical Association. Last year I helped plan the SNMA Region V Conference at the OUHCOM Dublin campus. I am really looking forward to my position as Conference Co-Chair on the board, and working with the other board members.



Conference Co-Chair

I am **Julie Aldrich**, a third year medical student at Campbell University School of Osteopathic Medicine. I was the founding co-director of the Campbell University Community Care Clinic as well

as founder of CUSOM's first Point of Care Ultrasound Club. I also served on the Skills Lab Committee for the EM student interest group. When I am not studying medicine, I enjoy experimenting in the kitchen, dancing and playing with my dog Chevy.



Publications Co-Chair

Hey, my name is **Hala Ashraf**, and I'm one of the new Publications Co-chairs for the National Student Chapter of the ACOEP. I grew up in Fairfax, Virginia and did my undergrad at the University

of Pittsburgh before I ended up in Blacksburg, Virginia, where I'm now in my third year at VCOM. In college, I studied EMS management, and when I became a paramedic during my junior year, I knew emergency medicine was the place for me. Everything about the ED, from the people involved, to the pace of the department made me positive that I had found my place in medicine. So here I am! When I'm not in the hospital, I can usually be found in the weight room, as my biggest passion outside of medicine is powerlifting. And with my love for powerlifting comes a love for food, so I really enjoy cooking as well. Fun fact about me: I served as a co-captain for the Pitt Quidditch team during my undergrad years. So obviously I'm a huge Harry Potter nerd too!



Publications Co-Chair

"Good afternoon. I'm **Christina Powell**, second year osteopathic medical student at LECOM-Bradenton. Everything we say today will be confidential." If this was a patient

encounter, I'd wash my hands, but we will leave the hygiene article for another edition. Let me share a few facts about your new Publications Co-chair. I was thrown into the business world at a young age. Through years of self-study and trial and error, I established and maintained a web development and graphics arts firm for almost ten years. Through the births of my three children, untimely deaths of my loved ones, and concerns facing health care for the impoverished in my hometown, my aspirations shifted from the art of marketing to the art of medicine. After this mental career change, I graduated summa cum laude and "Senior of the Year" from Florida Atlantic University's Honors College with a degree in Biochemistry. Halfway through my first year of medical school, I was commissioned as a Naval officer and am excited to serve those who protect our country! As the new Publications Co-Chair for the national ACOEP student chapter, I am honored to apply my previous skill-set to the field of emergency medicine. Fun fact: If you ever hear someone snort with laughter in the crowd, it was probably me.



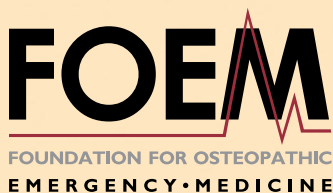
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Join the Foundation for Osteopathic Emergency Medicine at the 2017
ACOEP Spring Seminar in Bonita Springs, FL!



5K & 1-Mile DO DASH

Wednesday, April 19, 2017
5:45 pm – 6:45 pm

Get the blood flowing for a good cause! All conference attendees and their families/ guests – from walkers and novice runners to seasoned marathoners – are welcome to join the FOEM 5K Run for Research and one-mile DO-Dash!

REGISTRATION

| | BEFORE 3/18/17 | AFTER 3/18/17 |
|--|-------------------|------------------|
| 5K rate for attending physicians | \$60 | \$75 |
| 5K rate for students, residents & family | \$30 | \$40 |
| FOEM 1-Mile DO Dash (all) | \$20 | \$25 |

Registration includes t-shirt. Your shirt size is guaranteed if you sign up by March 18!

For more information or to register for an event, please contact Stephanie Whitmer
at swhitmer@foem.org, or register online at acoep.org/spring.



FOEM Case Study Poster Competition

Wednesday, April 19, 2017 from 2:00 – 5:00 pm

The Foundation for Osteopathic Emergency Medicine (FOEM) is proud to present the annual Case Study Poster Competition, in which students and residents present interesting or unique cases that have presented at their hospital. Winners receive certificates, cash prizes, and recognition in FOEM publications throughout the year. The deadline for submission of applications and abstracts is January 31, 2017.

A Call to Action FOR MENTAL HEALTH SCREENING

Dominic Williams, OMS-III

Lake Erie College of Osteopathic Medicine – Bradenton

I trust by the time you read this you're all recharged from the holiday season. Turkeys were successfully roasted without referencing Tintinalli's for burn therapy; Christmas trees hauled into the living room and decorated. Or, at the very least, you found yourself in the home of somebody whose idea of cooking something fancy goes beyond adding hot dogs to ramen noodles.



Unfortunately, the holiday season also brings more somber tidings; for instance, the disheartening myth that suicide rates increase during the festive months. In contrast to this misperception, December has the lowest suicide rate according to the CDC.¹ That said, around 50% of newspaper articles published in the years 2009-2012 continue to perpetuate this seasonal lie.¹ In truth, the following months are actually more dangerous to those contemplating suicide, so what better time than now to prepare ourselves to identify and treat these patients? I know it's hard to believe the mainstream media getting anything wrong, but bear with me as we take an in-depth look at the potential role of the emergency medicine student, resident, and physician in suicide prevention and depression therapy.

Suicide is the 10th leading cause of death in our nation.² In 2014, 42,733 individuals took their own life, and many, many more attempted the same.² From beloved celebrities such as Robin Williams, to the nameless teenager, to the 89-year-old man in my neighborhood; suicide affects all walks of life, all levels of affluence, and all ethnicities. Depression, the equally nasty younger brother of suicide, is a constant presence in our society, and even in our

field. Recent data from ten developed nations indicates an increasing prevalence of this disease. As emergency medicine continues to step to the frontlines of public health, it is a challenge to which we must rise.³

Take a moment to look at your hand. Four fingers and one thumb, right? One out of five is different. Your hand is going to help you remember a key fact, each time you slip on a glove to examine a patient. Studies have estimated that 20% of emergency department patients will screen positively for depression.⁴ That's more than double the population at large, according to data from 2012, which suggests that 7.6% of patients over the age of 12 are depressed at any one time.² It is a well-established fact that people with mental health difficulties tend to seek medical care more frequently.⁵ It is also thought that many of those struggling with mental health would open up to a provider if questioned directly. The ease with which we can transition to serious conversations about mental health will serve two vital purposes. One, it will destigmatize the issue of depression, and two, it will allow the patient the opportunity to be honest about their true intentions for their visit to your department. As osteopathic physicians we are quick



to tout the notion that we treat the whole patient—"body, mind, and spirit." This is another opportunity to practice our principles in prevention and truly connect to our patients.

Having established the 'why' of our practice, namely the safety and wellbeing of the patient, let us consider for a moment the 'how.' The notion of mental health inquiry seems solid enough on paper, but when triage is packed with patients, every hallway bed is full, and a twenty-something presents to you with nondescript abdominal pain after Taco Tuesday, you may be less inclined to pay attention. Here are some tips to help prevent overlooking the patient's subtle pleas for help.

- **Listen to your nurses**

Nursing staff are an incredible resource in the emergency department and will spend more time with the patient than you. If they suggest something might be amiss, it is well worth your while to investigate.

- **Ask direct questions**

According to Mental Health America, eight out of 10 people considering suicide give some sign of their intentions.⁵ This is your opportunity to field their cry for

help with specific questions about their plans and their mental wellbeing.

- **Acknowledge the risk factors**

Not every patient has the same statistical potential for depression. Consider the following as a basic guide from the current literature:⁶

- Prior depressive episode
- Family history
- Female gender
- Childbirth (i.e., postpartum depression)
- Childhood trauma
- Stressful life events
- Poor social support
- Serious medical illness
- Dementia
- Substance abuse

- **Look for signs on clinical exam**

The U.S. Preventive Services Task Force (USPSTF) notes the following symptoms as red flags of depression:⁷

- Insomnia
- Fatigue
- Chronic pain
- Recent life changes or stressors
- Fair or poor self-rated health
- Unexplained physical symptoms

- **Know your resources**

Mental health is notoriously overlooked and underfunded in my home state of Florida. As a provider, get to know the resources that are available to your community and the criteria a patient needs to meet in order to gain access to them.

- **Know the law**

When are you required by law to intervene? If a patient does show signs of depression, suicidal or homicidal ideation, what legal rights and responsibilities do you have to the patient? As it pertains to Florida, the Florida Mental Health Act—The Baker Act Chapter 394, F.S. encompasses all mental illness but does not stretch to substance abuse. Familiarity with the Marchman Act, which applies to a person allegedly abusing substances like drugs or alcohol, is useful to help deal with a topic that often coincided with depression.⁸

- **Post informational materials**

It has been suggested that one of the best places to put resources for abuse victims is in a bathroom, the one place they are likely to go unescorted. I would make

the case that mental health information would be appropriate here as well, affording patients the privacy to take down phone numbers and websites as necessary. Perhaps, even in their darkest moments alone, this will provide an outlet for their crisis.

In the emergency department, time is often a large constraint against action. To combat this, I give you the Patient Health Questionnaire-2 (PHQ-2). PHQ-2 is a simple two question screening tool, developed to find patients who may be experiencing a major depressive episode with a sensitivity of 83% and specificity of 90%.⁶ It is recognized that 68% of people will have contacted a physician in the month before they attempt to end their life. With one 30 second conversation, detailed in figure 1, a simple score can be obtained that could essentially change a patient's trajectory.

Research demonstrates the PHQ-2 to be just as effective as more extensive counterparts such as the Beck Depression Inventory.⁹ In my opinion, that isn't a wasted half minute. The PHQ-2 is a start, and if the screening is positive, can be followed by the PHQ-9, a more in depth and accurate assessment of the patient's mental state.^{6,9} Each facility will have its own protocol for mental health proceedings. I would highly recommend familiarizing yourself with their standard operations and if you see a deficiency, making a movement to initiate change.

What to do with this information? How does this impact our day to day patient interaction? Let's come alongside our

THIS IS ANOTHER OPPORTUNITY TO PRACTICE OUR PRINCIPLES IN PREVENTION AND TRULY CONNECT TO OUR PATIENTS.

patients and meet them at their point of need. Use your clinical observation skills to go one step further into the patient's history and develop your clinical gestalt. Make use of the screening tools and encourage those around you to do the same. As a student, make a habit of investigating the mental health of every patient. Become comfortable with the dialogue surrounding depression and suicide, in

the only way possible—practice. Further research regarding the optimal screening practices for mental health in the emergency department is needed since depression and suicide continue to plague our patient population. It is our responsibility to develop tools and methods to ensure our patients are connected to the resources available. Recognize the unfortunate truth that for a significant portion of the population, a missed diagnosis in the emergency department may be missed forever.¹⁰

Some of you reading this may have seen the effects of suicide and depression first hand. A career in emergency medicine does not create immunity to mental health issues. Arguably, this specialty exposes you to more stress and

pain than a number of other fields. My heart goes out to you, and I trust—whether in school, residency, or even currently practicing—there are resources available to you. I hope you can use

those experiences to become a more complete and caring physician, willing to go the extra mile for the mental health of the patients you see.

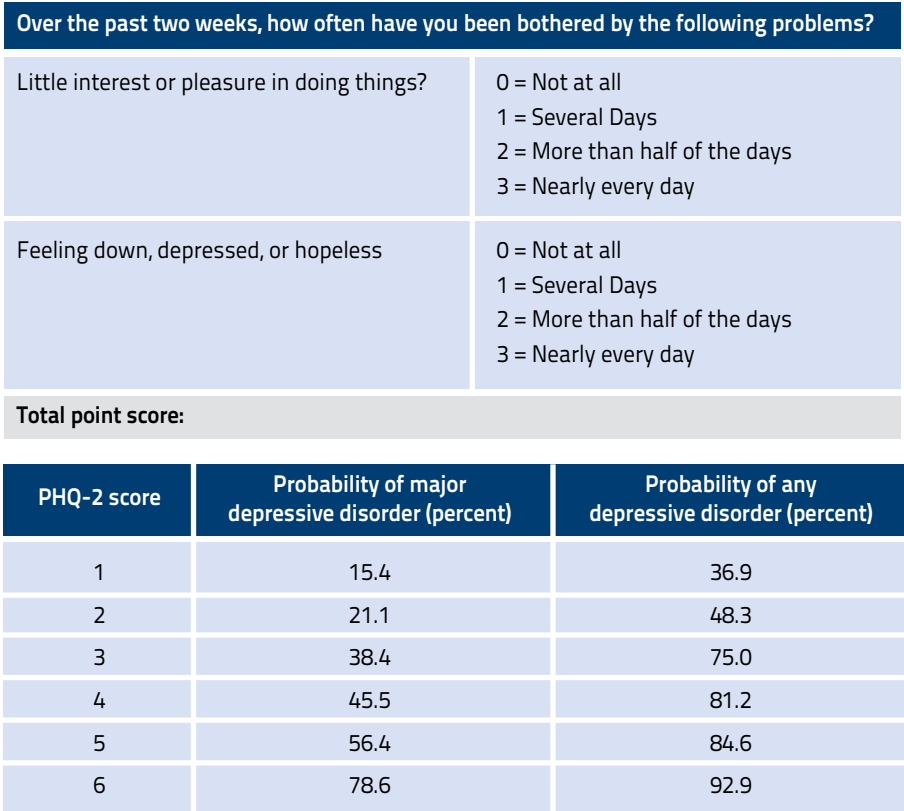


Figure 1 – The Patient Health Questionnaire-2⁶

Breaking Down Barriers:

ACOEP COUNCIL FOR WOMEN IN EMERGENCY MEDICINE CONTINUES TO EXPAND

Katie Douglas, OMS-III VCOM Virginia

Not too long ago an article went viral regarding a doctor who was turned away from providing immediate medical care to a fellow passenger on a flight.¹ With this passenger's life hanging in the balance, the flight attendant's primary focus was on ensuring that credentials were checked in order to verify this was in fact a doctor coming to the rescue. "Oh no, sweetie, put [your] hand down," the flight attendant said. "We are looking for actual physicians or nurses or some type of medical personnel. We don't have time to talk to you." The doctor in this scenario was a black female physician, Dr. Tamika Cross who is an OB/GYN resident. Meanwhile, a white male passenger who also raised his hand was brought to the patient without question. This is one example which highlights how pervasive gender and racial biases remain in our society.

Emergency medicine is unfortunately not immune from such disparities. In light of these issues, a group of 35 women gathered in San Francisco for the second annual meeting of ACOEP's Council for Women in Emergency Medicine. After a successful gathering of 90 attendees at the inaugural meeting in 2015, this time was spent getting to know one another on a more personal level. Highlights include the announcement of the Willoughby Award to Beth Longenecker, DO, FACOEP for her leadership and prominent work as a role model in the community. Alexis LaPietra DO, gave the keynote speech, highlighting her work to create an opioid-free ED program, ALTO, while simultaneously maintaining a marriage, beginning a family, and somehow keeping her sanity. After excelling in the New Physicians Group of ACOEP, Dr. Nicole Ottens will be taking the reins of the Women's Council and leading it into the future.

Stories of strength and perseverance were found in abundance amongst the crowd alongside the unfortunate stories of frustration and continued biases seen in both the hospital and in everyday life. Finding the right arena in which to voice such complaints is often a struggle for women in such high pressure and still male-dominated fields such as emergency medicine. Women have thankfully found their outlets through Physician Mom Groups, FemInEM, and now ACOEP's Council for Women in Emergency Medicine. However, airing grievances is

merely a stepping stone to the real purpose of such groups: enacting change. Women-specific issues are now coming to light and being managed through the advocacy of such powerful groups.

This year, we made great strides in addressing previously overlooked issues. For example, now breastfeeding and pumping areas will be specified for breastfeeding mothers at ACOEP conferences. This is a small success on the way to true equality. However, further work needs to be done in order to rectify pay inequalities, ensure physicians have an adequate work-life balance including both maternity and paternity leave, and make certain that women are respected for the professionals they have worked so hard to become.

While women comprise nearly half of all medical students,² only 23.5% of active EM physicians are females,³ and males continue to dominate leadership positions within emergency medicine.⁴ ACOEP is making progress towards reducing this inequality and recently elected two female physicians to this year's AOBEM Board of Directors: Nicole Ottens, DO and Stephanie Davis, DO. As of 2015, 39% of EM residents were female;⁵ with this new influx of female physicians in the field perhaps those in leadership positions will continue to rise.

It is ACOEP's Council of Women in Emergency Medicine's aim to not only lead osteopathic female physicians, but to have other medical professionals in emergency medicine get involved to better the field for all women. This group still resides in the developmental stage and seeks to expand its membership to become a more prominent influence for change. Now is the time to join the community. Reach out to the official Facebook page which provides weekly Wednesday discussions. Also, join the closed Facebook group "The Council: a forum for women in EM-ACOEP" for a more private dialogue. Get involved!



Carbon Monoxide POISONING

Danielle Kamenec, OMS-IV
LECOM

Kathryne Gunn, OMS-IV
LMU-DCOM

CASE

A 42 year-old man presented to the emergency department with recurrent episodes of lightheadedness and near syncope. The patient stated he had been feeling ill for the past few days, and he admitted to having a mild intermittent headache. He stated that his headache was located behind his forehead and did not radiate. The headache seemed to get better during the day, but worsened at night. He is employed as a postal worker. His social and past medical history is noncontributory.

His vital signs were stable including a respiratory rate of 20 breaths per minute and oxygen saturation of 99%. Physical examination was unremarkable. Laboratory tests revealed a COHb level elevated at 20%. How should carbon monoxide poisoning be diagnosed and managed? How often is this diagnosis seen among emergency departments across the United States?

DISCUSSION

Carbon monoxide (CO) poisoning is an important cause of morbidity and mortality in the United States. It is often overlooked and underdiagnosed because it is a colorless, odorless gas that has very nonspecific symptoms. This can result in failure of diagnosis and possibly lead to fatal outcomes. From 1999 to 2010 in the United States alone, the total deaths from unintentional, non-fire related CO poisoning was 5,149, with an average of 430 deaths per year.¹ It is interesting that the rate of death is three times

higher in males than in females.¹

CO poisoning can cause long term morbidity leading to costly medical expenses. Approximately 6,600 individuals are estimated to sustain long-term cognitive sequelae annually with a total loss in earnings of around \$925 million.² Precautionary measures are the best tools to prevent poisoning. The Centers for Disease Control and Prevention (CDC) recommends installing CO detectors in all sleeping areas of a home, as well as early furnace checks and guarded use of portable generators.³

Diagnosing CO poisoning requires a vigilant approach from physicians and all medical providers. Simple pulse oximeters cannot differentiate the subtle change in wavelengths between oxyhemoglobin and carboxyhemoglobin (COHb), and thus not useful in determining COHb levels. When a suspicion for COHb poisoning arises, blood levels must be checked using a multiple-wavelength spectrophotometer, also known as a CO-oximeter, to determine the COHb level. Per the CDC, blood sampling can be performed using either venous or arterial blood. Normal COHb levels can range from 1% in nonsmokers to 15% in heavy smokers.⁴ Symptoms tend to begin when levels surpass 10% and can progress to syncope, coma, and death above 40%.⁴ It is important to note that the correlation of symptom progression to initial COHb levels drawn is variable between individuals. A direct relationship between these two variables has only controversial literature support.⁵ Symptoms can also present weeks after exposure, most common in the elderly.⁴ Delayed symptoms tend to be neurologic or psychiatric and typically resolve within a year.⁴ Long term effects of CO poisoning are rare in cases that do not progress to a

coma.³ In addition, there is no increased long term risk of respiratory or cardiac mortality in those treated for CO poisoning.⁵

Carbon monoxide has over 300 times greater affinity for hemoglobin than oxygen.⁶ CO binds to mitochondrial cytochrome aa3 which reduces oxygen release in tissues.⁴ Impaired oxygen release causes a left shift in the oxygen-hemoglobin dissociation curve. This results in impaired oxidative phosphorylation in the tissues and thus hypoxemia.⁴ Ischemic changes and symptoms can be seen including myocardial ischemia, arrhythmias, stroke, lactic acidosis, and tissue necrosis.⁴ Hypoxia also causes a release of nitric acid in order to vasodilate and increase blood flow.⁶ Nitric acid combines with oxygen to form peroxynitrate, a free radical. The free radical effect causes cellular damage, leakage, and even death. The typical nonspecific symptoms of headache, weakness, nausea, and vomiting are thought to be due to a combination of these two events. No specific pathway has been confirmed for the initial tight and aching headache.

exposure.⁴ Current treatment revolves around continuous 100% normobaric oxygen administration started as soon as possible.^{4,7} The option of hyperbaric oxygen as an alternative treatment depends on a variety of factors including patient condition, COHb levels, and access to a hyperbaric facility.⁴ Patients who qualify for hyperbaric treatment include the following: those who are pregnant, showing signs of ischemia such as a myocardial infarction, severe lactic acidosis (pH < 7.15), and/or demonstrating severe neurologic signs such as a coma.⁴

CONCLUSIONS

In the above case, carbon monoxide poisoning was diagnosed, and upon further questioning, the patient revealed he installed a new stove himself recently. The patient was administered high-flow oxygen by means of a nonbreathing mask with frequent vital checks. The patient was admitted to the hospital for further evaluation and treatment. The fire department was called to the patient's house who confirmed the CO leak and turned off the supply

DUE TO THE INSIDIOUS NATURE OF THE GAS AND ITS NONSPECIFIC ASSOCIATED SYMPTOMS, EACH PATIENT PRESENTATION SHOULD BE REVIEWED WITH A HIGH SUSPICION FOR CARBON MONOXIDE POISONING.

The half-life of COHb is 320 minutes (approximately 5.3 hrs) on room air.^{4,7} This time is decreased to 74 minutes with administration of 100% oxygen and 23 minutes on hyperbaric oxygen at 3 ATA.^{3,11} Hyperbaric oxygen was first trialed in the late 1900's for treatment of COHb poisoning, and has been the staple of treatment for severe carbon monoxide poisoning (COHb greater than 25%) since that time.⁴ More recent trials have shown no difference in long term outcome between those treated with 100% oxygen and hyperbaric oxygen.⁴

The timing of hyperbaric oxygen administration may play a vital role. Some studies show decreased benefit if hyperbaric oxygen is started after six hours of CO

to the stove. Carboxyhemoglobin levels were measured again 10 hours later which revealed a level of 1.8%. The patient was appropriately discharged.

As cold weather approaches, patients across the United States will spend more time indoors and increase their use of portable generators. Both of these variables increase the likelihood of emergency department physicians encountering carbon monoxide poisoning in the winter months. Overall, CO poisoning is a prevalent and deadly occurrence across the US. Due to the insidious nature of the gas and its nonspecific associated symptoms, each patient presentation should be reviewed with a high suspicion for carbon monoxide poisoning.



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10 MUST HAVES, MUST DO'S, MUST KNOWS FOR EVERY EM GUNNER

Presentation by: Dr. Satheesh Gunaga, DO, FACEP, FACOEP

Summary by: Christina Hornack, OMS-III, Edward Via Virginia College of Osteopathic Medicine

Adapted from a presentation at Henry Ford Wyandotte Hospital, Michigan Symposium, April 30, 2016

We had the good fortune to have Dr. Satheesh Gunaga, Associate Program Director at Henry Ford Wyandotte, not just help coordinate the Michigan Regional Symposium on April 30, 2016, but also give us some of his top tips on how to prepare for and excel during your EM audition rotations. His tips range from free online resources, to valuable memberships, to must-own books, and finally a little something to help you keep perspective during your training and beyond. Without further ado, here is his list:

1

Join the ACOEP Student Chapter! Amazing resources, mentorship program, access to online classrooms, educational podcasts, and regional symposiums. Taking on a leadership role is very impressive!

2

Join EMRA and get access to even more resources, including membership to ACEP and your state's ACEP chapter and other great resources.

3

Submit your ERAS Application on Day 1:

- July 15th for AOA Programs
- Sept 15 for ACGME Programs

You want to be part of a much smaller pool of applicants—programs may have ten applications to review on the first day, but several hundred, if not a thousand, as the season progresses.

4

The #1 must-have book is *Emergency Medicine Secrets*. This is a fun read, divided by chief complaint and formal diagnosis, with lots of questions and answers. Awesome and valuable EM knowledge for when you're working in the ED or just laying on the couch. And while we're on the subject—ABR—Always Be Reading! Knowledge will always impress your colleagues in the ER.

5

The #2 resource is Epocrates. There's a free download version that is comprehensive and will tell you everything you want to know about medications, including a picture of the medication if the patient can't remember what they take.

6

#1 internet resource is EM:RAP. EM:RAP is a podcast to which you get free access through

EMRA. You can get access to a free month today to check out a podcast and see if you like it at www.emrap.com.

7

#2 internet resource is UVA Radiology Tutorials. For when you absolutely, positively, have to be sure you know how to read a chest x-ray, plus lots of other tutorials on a variety of subjects. Visit www.med-ed.virginia.edu/courses/rad

8

#3 Internet Resource is MDCalc.com. This website has all sorts of helpful information. Telling your attending that you have a low suspicion for PE doesn't hold as much weight as telling your attending you have a low suspicion for PE because their Well's Score was only a 3. Check it out!

9

EM Residents are always looking for research assistants in medical students. Reach out to residents and see if they need help.

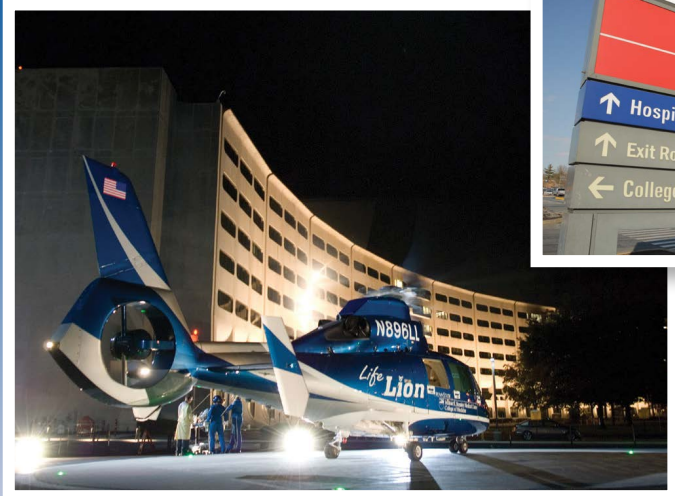
10

Reach out to residency directors, PD's, and APD's ASAP and get on their radar. Go to grand rounds if you can, and keep going.

Rules for Life: Get your sleep when you can, fill your life with love, and enjoy life fully.

Thank you to Dr. Gunaga, and to all of the wonderful residents, attendings, and staff of the Henry Ford Wyandotte program in Detroit, Michigan.

If you liked what you saw here, be sure to check out our next regional symposium—coming to a region near you! For the most up-to-date information on our future events, visit the ACOEP website.



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For additional information, please contact:

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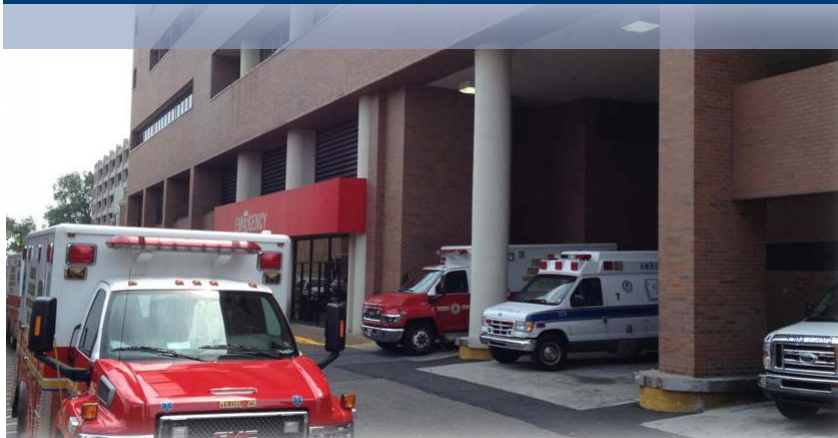


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INSTITUTION BED SIZE: 772 inpatient beds, 76 ED beds

ED VISITS PER YEAR: >100,000 at Einstein Medical Center Philadelphia

~40,000/year at community site Einstein Medical Center Montgomery

ACGME ACCREDITATION STATUS: Full

TRAUMA CENTER: Level 1 Trauma Center

HOSPITAL LOCATIONS: Main site is located at Einstein Medical Center Philadelphia in North Philadelphia. Secondary site for community EM rotations is located in nearby Montgomery County.

AVAILABLE FELLOWSHIPS: Toxicology

WHAT IS UNIQUE ABOUT YOUR PROGRAM?

- Graduated responsibility with resident years
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- Scholarly time scheduled in block schedule to allow residents to pursue individual interests while completing their residency requirements
- Simulation Center
- Dedicated "Lab Week" in December, full of hands-on procedural skills labs

WHAT DO YOU DO OUTSIDE OF THE HOSPITAL? There is so much to do in Philadelphia and the surrounding area! Just in town, there are tons of museums, two zoos nearby, one aquarium just across the river in Camden. Not to mention Philadelphia sports to cheer for! Philadelphia is a great city location wise for access to the Jersey beaches, Pocono Mountains, proximity to Washington D.C., Baltimore, New York City and Boston. We also have an extensive park system (Fairmount Park) and trail system (Wissahickon Valley). Personally, I love to plan a Friday night of trying a new restaurant downtown followed by a show at the Academy of Music or the Kimmel Center for the Arts!

WHAT ARE THREE WORDS THAT DESCRIBE YOUR RESIDENCY? Dynamic, diverse, dedicated.

Follow on Twitter [@EinsteinEMed](https://twitter.com/EinsteinEMed)

For more information visit www.einstein.edu/education/residency/emergency-medicine

Information courtesy of Megan Stobart-Gallagher, DO, FAAEM, the Director & Undergraduate Medical Director at Einstein Healthcare Network

WHAT'S NEW IN EMERGENCY MEDICINE?

Aadil Vora, OMS-III
NSU College of Osteopathic Medicine
ACOE-SC Research Chair

Apneic oxygenation in adults undergoing rapid sequence intubation in the emergency department

A key step in Rapid Sequence Intubation (RSI) is pre-oxygenation. Pre-oxygenation is maximizing oxygenation and denitrogenation in a patient by some method (ie. Nasal Cannula, Non-Rebreather, BiPAP) before the induction and paralytic agents are administered. It takes about one minute, for this "RSI cocktail" to adequately sedate and paralyze the patient to facilitate intubation. In that minute, positive pressure ventilations should be avoided because of the risk of gastric insufflation and aspiration of gastric contents. This minute, absent of ventilation, is called the apneic period. Unfortunately, pre-oxygenation often isn't enough to maintain some patients' oxygen saturations during the apneic period and subsequent intubation. But Apneic Oxygenation with a nasal cannula left on the patient during the apneic period and intubation may mitigate this risk of desaturation.

A recent observational study, published in June 2016, found that Apneic Oxygenation was associated with improved First Pass Success without Hypoxemia (FPS-H) in adult patients intubated in a single academic ED. Out of 635 patients, 380 had apneic oxygenation and 255 did not. Patients in the apneic oxygenation group had an 82.1% rate of FPS-H, while those without it had a rate of 69%. However, there is a previous randomized controlled trial, known as the FELLOW trial, that found no improvement in lowest oxygen saturation during intubation with Apneic Oxygenation of critically ill ICU patients. The reason for this dichotomy in the literature is unclear. Apneic Oxygenation may be less efficacious in patients who are intubated for pulmonary disease rather airway protection. This may be because patients with pulmonary disease often require positive pressure to maintain adequate oxygen saturations (ie. acute respiratory distress syndrome, pneumonia), which Apneic Oxygenation does not provide. Most ED intubations are for airway protection rather than pulmonary disease. Therefore, the FELLOW trial may have found no benefit

with Apneic Oxygenation because of some selection bias in the study population. Nevertheless, Apneic Oxygenation is cheap, easy, and likely causes little to no harm, so it is still practiced by many providers.

Sakles JC, Mosier JM, Patanwala AE, Arcaris B, Dicken JM. First Pass Success Without Hypoxemia Is Increased With the Use of Apneic Oxygenation During Rapid Sequence Intubation in the Emergency Department. *Academic Emergency Medicine*. 2016;23(6):703-710.

Semler MW, Janz D, Lentz RJ, et al. Randomized Trial of Apneic Oxygenation during Endotracheal Intubation of the Critically Ill. *Am J Respir Crit Care Med* 2016;193(3):273-80.



Safety of magnetic resonance imaging and gadolinium in pregnancy

The use of MRI in pregnancy is sometimes questioned, because radiofrequency radiation heats tissue, and that could theoretically lead to birth defects. However, a new study retrospectively charted the effects of MRI on pregnancy outcomes in 1,737 deliveries and upheld the existing position that MRI is likely safe in pregnancy. This study is the largest study to date on this subject. Researchers reported that an MRI in the first trimester of pregnancy was not associated with stillbirth, neonatal death, congenital anomalies, neoplasm, or vision and hearing loss. The children born in this study were followed for four years. This same study also found that

the use of gadolinium in MRI at any point in pregnancy is associated with an increased risk for stillbirth and neonatal death. Children exposed in utero were at increased risk for rheumatological, inflammatory, and infiltrative skin conditions. This study corroborates the long time contraindication of Gadolinium in pregnancy.

Ray JG, Vermeulen MJ, Bharatha A, Montanera WJ, Park AL. Association Between MRI Exposure During Pregnancy and Fetal and Childhood Outcomes. *JAMA*. 2016;316(9):952-961.



Nicotine poisoning from e-cigarette exposures in children

E-cigarettes have become pervasive in the nicotine consumer market today since their take-off in 2010. Many view e-cigarettes as a safer alternative to cigarettes and a useful tool to help smokers quit, but the incidence of e-cigarette poisoning in children has been rising. A new retrospective study analyzed more than 29,000 phone calls about nicotine and tobacco product exposures in children younger than 6 years old collected by the National Poison Data System. The goal was to investigate the epidemiologic

characteristics and outcomes of children exposed to e-cigarettes. In 2010 regional poison centers received on average 20 calls each month about e-cigarette exposures in children. But in 2015, that number climbed to 200 calls each month. Children younger than 6 years old account for the majority of these exposures. Children are often attracted to the candy-like sweet scents and colorful packaging of the cartridges of e-cigarettes and vaporizing devices. The most common method of ingestion is orally, but children can also be exposed through the skin, eyes, and lungs. Typical clinical features of nicotine toxicity are nausea, vomiting, tachycardia, and lethargy. Life-threatening effects consist of seizures, apnea, coma, and cardiac arrest. Children exposed to e-cigarettes were 5.2 times more likely to be admitted to a health care facility and 2.6 times more likely to have a severe outcome than children exposed to regular cigarettes. Nicotine fluids used in e-cigarettes can be as concentrated as 36mg/ml, and only 1-2 mg in young children can cause the onset of toxicity symptoms. One death has occurred in association with a nicotine liquid exposure. Although there is a significant history of regulation of cigarettes, many e-cigarettes and vaping devices do not have child safety features to prevent exposure.

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