

DPM NEWS

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Award Winners

On page 5, see who won the 2019 MLREMS Awards in numerous categories.

Afib

Beta Blocker or Calcium Channel Blocker? Give medication or withhold? Dr. Bajdas gives us some pointers and a quiz on page 7.

BSI, Scene is Safe

Think the topic of scene safety is boring? Then you haven't read my take which can be found on page 11.

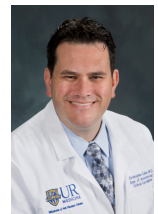
As we all work to adapt to the ever-changing "interim normal", EMS has been amongst those professions whose employees have had to continue to work, adapt daily, find childcare and educate their children, and try to stay healthy. The stress on us and our families has been extreme. I've realized this during numerous instances when I've had a lack of empathy for people who have been able to work from home and now express their trepidation or disdain for being forced to return to in-person work this fall. I want to shout, "welcome to the team!" This is, of course, not a very gracious or empathetic perspective but is understandable as we have had stressor after stressor piled upon us for six months straight. That being said, we can all be grateful for the camaraderie, change of scenery, and satisfaction that comes with making a difference, all of which this profession has provided to us during the pandemic.

Please watch out for each other and seek help for yourself or your peers if the stress becomes overwhelming. We are all in this together.

Eric Rathfelder
Editor-In-Chief

From Celebrated to Ostracized: Life in the COVID ICU

Christopher Galton MD, NRP, FP-C



In March 2020, all of our lives were thrown upside down due to the SARS coronavirus 2 and COVID-19 pandemic. The next few months would us had expected yet brought out the best in our EMS community. We are a group of people that thrive in the face of adversity and this was certainly no exception. This column details my version of the COVID-19 craziness from inside the hospital walls.

present challenges that none of

My work week started off like any other. I had an operating room assignment with transplant call on Monday, which went well. On Tuesday, the hospital was starting to really think about how to address the

inbound COVID-19 patient load and many options were being thrown around. On Wednesday, the hospital started shutting down ORs, but my cases were still going. I went to report to work on Thursday morning, but was advised that I was being reassigned into Strong Memorial's new ICU for COVID-19 patients, called the HIDU (highly infectious disease unit). I was to go home and plan on starting in the HIDU on Monday. By Friday, I was advised that I would be working nights for the next three months. Like many of you, this created a significant amount of problems on the home front without many easy to come by solutions.

After some very quick building and a few adjustments to my basement, my wife and I had figured out a work flow that we hoped would keep my family safe from me while I worked in COVIDland. I sat down with my children and discussed what the future would look like and why their father would need to stay separated from them for long periods of time. By now, my kids are used to their dad explaining why he was putting himself at risk and have always been very understanding of the choices I have made. In this case, knowing that I was in the house but was not willing to give them the hugs and kisses they are accustomed to was very hard on them. Although we all realize many of the sacrifices we make to have a career in EMS and healthcare, it frequently takes situations like this to make these points very salient in our lives. We should all be taking more time to identify and thank our loved ones for allowing us the freedom and space that is required to be emergency services providers.

On Monday evening, I was packing up to go and saying my goodbyes to the family, when I realized that I did not even know where to report to. I had no idea where the HIDU was physically. This was remedied with a call to a colleague, who jokingly advised that they had the same problem when they arrived to the hospital that morning. On Monday that week, the HIDU census was four patients. Two ICU patients, and two ward patients that we were monitoring. Sounds like a walk in the park right? The next seven days would become the hardest days I have ever worked as a physician.

In the initial stages of the COVID pandemic, testing patients was a problem. When you combine tests that had a two to three day turnaround time with not knowing much about a novel infectious disease, we ended up having nearly every ICU admission for the hospital come through our unit until their test results came back as negative. We joked about it at the time, but our census would bounce around very dramatically on a daily basis. We would admit 10-12 patients in one day, but kick nine to ten patients out to the appropriate ICU as soon as their tests would come back. We called it the accordion effect. Every day when we arrived on the unit, it was fun to see just how far down the hallway and around the bend our patients had landed. By the end of the week, it was how far into the second ICU we were.

During that first week, many of us were asked to do things that we were not accustomed to. In great part, this was because of staffing shortages on the units and a group of people that were not willing to enter the HIDU for their own personal reasons. When combined with a very unique work flow, many of us got very busy very quick. When a patient was admitted to the HIDU, the attending ICU physician would get into the room alone and get all the necessary procedures done such as intubations, central venous lines, arterial lines, Foley catheters, etc. To reduce the exposure burden on the nursing staff, we frequently did much of the initial nursing care as well since we were already in the room. I became the highest paid environmental services staff member in Strong's history when I started doing the 0200 trash run around the unit.

For those of you who have had the opportunity to work through a crisis in the past, you immediately recognize the camaraderie that develops within the ranks. Many of the nurses and intensivists came from different units, so we weren't all familiar with each other. When you combine that with masks, face

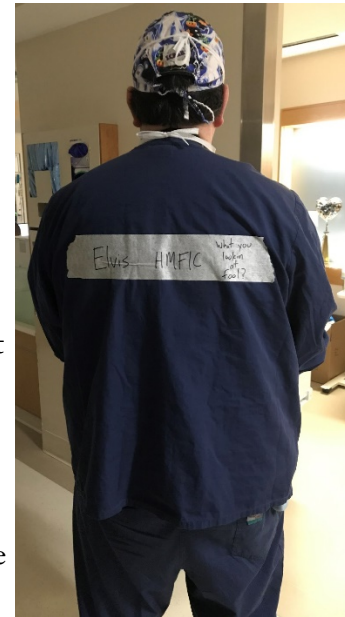
shields, and gowns, we couldn't even tell who was who when staff went into a room. That was easy to fix with a roll of tape, a Sharpie, and colleagues that were more than happy to tag each other with whatever they thought was humorous. In the case of the HIDU, we were also assigned small Motorola radios, which led to call signs. You can all imagine that some of the names got a bit edgy, but were all funny and gave us an opportunity to come together as a team.

Although you might not appreciate it, when you are out on the road and listening to the radio traffic, it is a bunch of people who are properly trained at using a radio. This was not that group of players and some of the stuff that occurred was pretty ridiculous, like asking for a new fecal containment system and a change of clothes. As someone who is very accustomed to professional radio traffic, it was hard to listen to, but made for funny background noise.

It took a little while to get into a rhythm treating these patients given the pace that they were raining down on us. Early on, it became very evident that they have no wiggle room and got incredibly sick, incredibly quickly. I would equate it to the respiratory version of a massive MI or saddle pulmonary embolism. Every EMS person likes to tell a good patient story, and here is my token story for this article. I even included the vitals screen from the medical record to emphasize just how quickly these patients decompensate.

I was making my evening rounds and eyeballing all of my patients after sign out. When I got to this room, the nursing staff advised me the patient was feeling good and ventilating well. He finished up his dinner 30 minutes ago and had been watching TV since. I knocked on the glass and he gave me a thumbs up, so I moved on. That was at approximately 2010. I saw a few more patients then sat down at my desk. A few minutes later I got a phone call at 2018 from the nurses saying that this patient had developed some trouble breathing. I got my PPE and walked down the hallway.

I got to the room at 2020 and his oxygen saturations were plummeting. I quickly got on my PPE and drew up the RSI medications. I was in the room with my PPE, intubating equipment, and meds drawn up by 2022. The medications were given, ETT was placed, and he was on the ventilator within 90 seconds of me entering the room. As you can see from his vitals chart below, I saw an oxygen saturation of 2% (along with the standard resp rate documentation of 18) that was demonstrating an appropriate waveform, so it was legit. He was extubated ten days later, neurologically intact. This was a typical trajectory for the COVID patient population.



Today 2012 - Today 2024										
03/28 2300 - 03/29 2259										
015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
61	67	68	68	69	68	68	63	60	67	Heart Rate
61	69	67	69	69	68	63	60	60	67	HR Pulse Ox
22	25	19	31	23	16	18	18	16	7	Resp rate
7	12	16	16	16	166	165/63	155/59	84/38	165/68	BP (a-line)
03	85	104	105	98	100	101	91	50	105	MAP (a-line)
00	100	93	90	76	80	79	56	2	95	SpO2

Many of the physicians, physician assistants, nurse practitioners, and nurses were unexpectedly taken from our primary jobs and reassigned to the HIDU during this crisis. It led to most of us changing our routines and uprooting our families in our wake. Although this was difficult, the most frustrating part of our lives was feeling ostracized by friends,

families, and members of the community. The best example of this was when one of my colleagues was trying to buy a few groceries at Wegmans and was asked to leave because they were wearing scrubs. Ironically, the scrubs were clean because she had changed clothes before she left the hospital. There were many times when people looked at me like I had the plague because I was buying a gallon of milk for my family after a long night in the HIDU. I was tempted to lean over and tell them that I had just spent a 12+ hour shift treating Rochester's sickest COVID patients ... and ask them if they needed a hug.

For every bad experience I had in the community, there were at least ten times as many patients and families that were absolutely wonderful. I have made a habit of calling my patient's families on a daily basis to check in. Even though they cannot be with their loved ones, the families are consistently pleasant and very appreciative of all the work we were doing. I cannot imagine how hard it would be to have a family member intubated in an ICU and not be able to see them, but it has become the norm. I certainly hope that changes back soon so all of our patients can be with their families.

Over the years I have developed excellent relationships with the nursing staff that I work with routinely in the ICUs. Since the HIDU assignments were voluntary, I had the chance to meet and work with nurses from all over the institution's critical care units. I was fortunate to be assigned with an exceptional group of nurses who solved problem after problem with unique and effective solutions. One example of this is having the IV poles stationed outside the patient rooms to limit the number of times they had to go in and out. The nursing staff of the HIDU really earned their MacGyver merit badge that week and kept many patients alive that probably would not have otherwise survived. Of all the people that deserve some credit for the lifesaving work that occurred during this pandemic, they should be at the top of the list.

There have been many instances over the course of my career where providing a specific treatment one year is considered standard of care, only to find out years later that we killed people in the process. The best example I remember is using lidocaine for PVCs. When I started my career in the 90s, we normally administered doses of lidocaine for any PVCs that we saw on the EKG. Years later it was studied and definitively identified that lidocaine for PVC treatment reduced the PVCs but increased mortality. Translated, I treated the funky looking beats and made myself feel better while contributing to the demise of my patient. I think COVID-19 will yield many similar lessons five years from now. Currently, we are assimilating all the evidence from around the world to do what we think is the right thing. I have no doubt that what is best from them today will be studied and aspects of our care will be identified as having harmed them. That reality leaves you with a great deal of indigestion. Yes, I have been hammering through the TUMS.

Reflecting back on my time in the HIDU is cathartic. Inside the hospital I am frequently identified as the guy who runs towards the fire, not away. That is 100% a reflection of my EMS background and it makes me jealous of the relationships that develop when riding in an ambulance. Your brothers and sisters in emergency services are a special group of people that rise to every challenge that is put in front of them. Although it was challenging, I think the reason I loved my time in the HIDU is because I developed the same relationships with my HIDU colleagues that I have with my emergency services colleagues. We were a group of people doing work that no one else was willing to do, in a high risk environment, and it brought out the best in us. I hope you all realize just how powerful and special the



bonds you develop with your EMS colleagues are. If you have not gotten there yet, give it a few more years and it will make more sense.

My thanks go out to the following group of doctors and nurses who willingly jumped into the Lion's Den in that first week to care for the sickest group of patients that many of us will see in our careers: Point Break, Hot Cinnamon, Danza, Grasshopper, Nurse Jackie, Page Turner, SS Bill, Pretty Boy, Professor Z, Donut, Mistress Barb, and all the rest of the HIDU staff.

I look forward to when we can all sit back and kick it by the BBQ, but until then, be safe and keep you and your EMS brothers and sisters safe through this pandemic. Your willingness to care for the sick and injured deserves more kudos than I can provide, but you have my personal thanks for going above and beyond to do the right thing and care for the members of our MLREMS community. It continues to be an honor to call you my EMS family.

If you have any questions or comments about this column, please feel free to contact me at christopher_galton@urmc.rochester.edu.

2019 MLREMS EMS Award Winners

Submitted by the MLREMS PIER Committee

First, CONGRATULATIONS to all of our MLREMS Regional EMS Award winners and nominees for 2019! This was the year that, well, the celebration was far from the “norm”. We usually celebrate our winners at an awards’ reception at the STEP Conference. That didn’t happen. With the opportunity to bring a guest. That didn’t happen either. And the opportunity to attend the conference with a \$50 voucher to use toward the cost. Again...didn’t happen. 2020 was the year we had to get creative, no thanks to COVID-19. And that’s what we did. This year, we arranged to have ALL the award winners and nominees for Agency of the Year, present for a virtual ceremony during our MLREMS Regional Council meeting, on the Monday of EMS Week, May 18, 2020. A huge invite went out to all agencies in the region for anyone who could, to join us. We had over 60 attendees on the Zoom meeting that day! It was a fantastic turnout! And during EMS Week, members of the MLREMS Council and PIER Committee, took the celebration (with proper social distancing, of course) to all award winners, at either their agency or home, whichever they preferred, armed with the physical awards themselves, a cookie tray and lawn sign to proudly display (and a banner for the Agency of the Year). Something different, for sure. Who knows, maybe we’ll start a new trend. In addition, each winner will be offered the opportunity to attend the award reception at next year’s STEP Conference and a \$50 voucher to attend the conference.

We have a lot of great EMS and in-hospital providers in this region and many have been nominated over past years. We are fortunate to work in a very progressive region, with great leaders, trainers and providers. Be proud. Our customers look to us to make a really bad day better. They trust us. Total strangers for the most part.

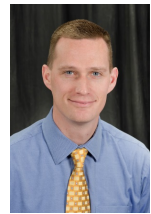
Congratulations to this year’s 2019 MLREMS EMS Award Winners!

- ALS Provider of the Year: John Lents, CHS Mobile Healthcare
- BLS Provider of the Year: Tanya Tatu, Dansville Ambulance
- EMS Communications Specialist of the Year: Tim Wood, Monroe Ambulance

- EMS Educator of Excellence: Jan Lloyd, Monroe Ambulance
- Physician of Excellence: Dr. Maia Dorsett, UR Medicine
- Registered Professional Nurse of Excellence: Nina Doyle, Rochester Regional Health
- Harriet C. Weber EMS Leadership Award: Tom Coyle, Monroe Ambulance
- Richard “Dick” Tripp Community Service Award: Floyd Sick, Dansville Ambulance
- EMS Agency of the Year: Dansville Ambulance

When there is no DNR

Jeremy T Cushman, MD, MS, EMT-P



You arrive to a 9E1 for an 86 year old female with a history of cancer. Her family was next to her when she took her last breath and they do not want resuscitative efforts. Of course, there is no DNR, no MOLST. Sound familiar?

This is certainly not an uncommon occurrence, and as a provider we are stuck in that gray zone of no obvious death and no DNR/MOLST to make it clear that we don't have to begin resuscitative efforts. Handling these calls is not complex, but they are often uncomfortable. The keys are to assess the scene, gather the requisite information, and speak to Medical Control about the options. The discussion with Medical Control is one of the most critical actions, so here are some pearls to help facilitate that conversation.

When calling Medical control, identify yourself, your agency, and your certification – The last item is probably the most important as it helps the doc recognize your protocol limitations (I can't ask an EMT to put them on a monitor, for example).

Provide the clinical scenario – identify that this is an elderly female with a history of cancer and that this was an expected death. The medical history is important because although I am not suggesting that we don't resuscitate anyone with a history of cancer, the medical history makes it logical that the family would not want resuscitative efforts. If there is no medical history then I might want to ask some additional questions and/or speak to the family as to why they are not choosing to resuscitate. The fact that this event was expected is also helpful as it suggests that the family was preparing for, and therefore had discussions about, resuscitative efforts.

Provide the clinical exam – I would expect the crew to identify (in this case) that although the patient was not breathing and had no palpable pulse, that there were no signs of obvious death (lividity or rigor) and that the estimated time the patient was last seen alive was about 15 minutes prior to the Medical Control conversation. This is also important information for the doc because first, I know the crew confirmed pulseless/apnea and knew their protocol that there were no findings of obvious death to be able to call it on protocol alone; and second it gives me a timeframe to consider that 15 minutes without any resuscitative efforts in a patient with multiple comorbidities is highly unlikely to result in any favorable outcome. This allows me the opportunity to determine that in addition to wanting to honor the patients/family wishes, I can also make a determination of “medical futility” that supports the withholding of further medical treatment.

Share the family wishes – In this case, I would expect that the provider indicates that there were multiple family members in attendance and consent was unanimous to withhold any resuscitative efforts. The doc may ask the provider to reconfirm the desire to allow a natural death and may even speak with the family member or loved one. Further, there should be no concern by the crew to not resuscitate. This is another important factor – you are there and can see that the house is in order, nothing is suspicious, and that the request is appropriate. I know in my own practice, and some other docs will do the same – I will ask to talk to the family member so it's advisable to make that call from a short distance away from the family in a professional and respectful manner so you can still reach the family member to engage Medical Control.

Having some preparation for making that medical control call will help facilitate getting what you believe is in the best interest of the patient and family. Engaging in conversation with family or loved ones, and offering condolences is appropriate, but understandably difficult. If you did not catch it, Dr. Dorsett put together a great training video on how to have death notification conversations in light of COVID. If you haven't you should check it out. It's available at https://youtu.be/y-y43G4y5_Y

Preparing for these calls – both the conversation with medical control and speaking with family – require preparation and practice. I hope this provides you some guidance on one of the most impactful moments you have on following a patient's wishes, and engaging in an empathetic and compassionate conversation with the family.

Atrial Fibrillation Rate Control Considerations

Haley Bajdas, Pharm.D., PGY-2 Emergency Medicine Pharmacy Resident

Atrial fibrillation (AF) is a cardiac rhythm disturbance that affects 1 - 2% of the population and is the most commonly diagnosed dysrhythmia in the emergency department (ED).^{1,2} AF occurs due to uncoordinated activity of the atria that results in the irregular passage of impulses through the atrioventricular (AV) node to the ventricle. As there is no uniform atrial depolarization or contraction, only quivering of the atrial walls, ventricular filling and cardiac output is reduced.

Prior to treating AF with rapid ventricular response (RVR), it is imperative to consider other causes of the dysrhythmia. Primary AF may not be the cause of tachycardia and hypotension (if present). Myocardial infarction, gastrointestinal hemorrhage, hypovolemia, alcohol withdrawal, pulmonary embolism, hyperthyroidism, sympathomimetic use, or hypokalemia may be the primary etiology.^{2,3} Sepsis can also result in the development of AF as inflammation and oxidative stress has the potential to directly change electrical activity of the cardiac myocyte.² If the etiology of these hemodynamic derangements are not due to primary AF, interventions attempting to specifically target AF are less likely to be successful and may be harmful. A retrospective cohort study of 416 patients with AF and an acute underlying illness evaluated the safety and success of rate or rhythm control.⁴ Of the 135 patients with attempted rate (n = 105) or rhythm (n = 30) control, 55 adverse events were reported (40.7%) compared to 281 patients managed with no arrhythmia-specific therapy who reported 20 adverse events (7.1%) (RR = 5.7, 95% CI 3.6 - 9.1). Of the 105 patients with attempted rate control, 20 patients were successfully controlled (19.1%) and 4 of 30 patients (13.3%) were successfully rhythm controlled. If the patient has AF with RVR and an underlying condition is suspected, initial management should focus on the underlying condition in the early stages of care.

The first consideration in the treatment of primary AF is evaluating perfusion and hemodynamic stability. Direct current cardioversion is indicated for recent-onset AF and hemodynamic instability such as hypotension, myocardial ischemia, or pulmonary edema.¹ While appropriate anticoagulation management around the time of cardioversion is important to reduce thromboembolic risk, initiation of anticoagulation therapy for patients with AF requiring emergency cardioversion should not delay the intervention.

For stable patients with primary AF, either rate or rhythm control treatment strategies are options. For patients older than 65 years of age, two large trials showed no difference in outcomes between rate control versus rhythm control after 5 years.^{5,6} However, as a long term strategy, rate control is generally preferred due to the simple medication regimen, generally lower cost, and circumvents the proarrhythmic adverse effects of antiarrhythmic drugs.^{1,7} Rate control is also advised for patients with valvular disease, hypertension, and chronic AF.¹ After 48 hours, patients who present with AF usually require anticoagulation due to increased risk of stroke.¹ It should be noted that in younger patients, it is preferred to have restoration of normal sinus rhythm through rhythm control to improve quality of life and reduce symptoms.¹

In the prehospital and ED setting, rate control is often selected for the management of stable AF with a goal heart rate of 80 - 110 beats/ minute. Beta blockers (i.e. metoprolol) and non-dihydropyridine (non-DHP) calcium channel blockers (i.e. diltiazem) are the most commonly used agents. Several studies have attempted to compare the effectiveness of these two pharmacologic strategies for rate control of AF. One well-designed prospective, randomized, double-blind study of 52 patients evaluated diltiazem 0.25 mg/kg IV (maximum 30 mg) compared to metoprolol 0.15 mg/kg IV (maximum 10 mg) with a second dose provided if rate control was not achieved after 15 minutes.⁸ The primary outcome of a heart rate less than 100 beats/ minute was achieved in 95.8% of the diltiazem group and 46.4% of the metoprolol group. However, this was a convenience sample of patients and the maximum dose of metoprolol used in the study is lower than guideline recommendations of 15 mg.¹ A systematic review evaluating beta blockers versus calcium channel blockers for AF with RVR demonstrated that diltiazem has an 80% greater likelihood of controlling heart rate than metoprolol.⁹ But again, these studies generally do not maximize the dose of metoprolol making direct comparison difficult.

It is important to know the pharmacology, dosing, and adverse effects of both metoprolol and diltiazem for medication selection.

Metoprolol is a beta₁-selective adrenergic receptor blocker that leads to decreased sympathetic activity on the heart and prolonged AV nodal conduction time and refractoriness.^{10,11} This ultimately results in a decreased ventricular rate in patients with AF. Guidelines recommend metoprolol 2.5 to 5 mg IV over 2 minutes, repeated every 5 minutes to a maximum of 15 mg.¹ This dosing strategy is heavily translated from the traditional myocardial infarction dose of 5 mg every 5 minutes to a maximum dose of 15 mg. The IV to oral conversion ratio is 1:2.5 and therefore a dose of 5 mg IV is equivalent to 12.5 mg oral. Typical maintenance doses of metoprolol usually grossly exceed this dose which highlights that these initial or total doses may be suboptimal for acute treatment. Effect on heart rate is typically seen within 5 minutes, maximum beta blockade in approximately 20 minutes, and the duration of activity is 5 - 8 hours.^{2,10} Metoprolol primarily undergoes hepatic metabolism via CYP2D6.¹⁰ Elimination mainly occurs through biotransformation in the liver and is then excreted in the urine. The mean half-life is 3 to 4 hours but elimination half-life may be prolonged up to 7.2 hours in those with hepatic impairment although there are no dose adjustments for renal or hepatic impairment. Metoprolol is contraindicated with second- or

third-degree heart block. Common adverse effects reported are bradycardia, hypotension, and dizziness. Although less common, dyspnea of pulmonary origin may occur.

Diltiazem, a non-DHP calcium channel blocker, exerts its effect by inhibiting the influx of calcium ions during membrane depolarization of the cardiac and smooth muscle.¹² Diltiazem slows the ventricular rate and AV nodal conduction time and prolongs refractoriness. The initial dose of diltiazem is 0.25 mg/kg actual body weight (~ 20 mg) administered over 2 minutes. If the response to the first dose is inadequate, a second dose of 0.35 mg/kg (~ 25 – 30 mg) may be administered. The onset of action is 3 minutes and duration is 1 to 3 hours. Therefore, patients who respond to IV bolus therapy will require a continuous diltiazem infusion or oral diltiazem. Diltiazem is extensively metabolized by CYP-450 enzymes in the liver and is eliminated in the urine. The elimination half-life for a single IV dose is 3.4 hours and there are no dose adjustments for renal or hepatic impairment. Nonetheless, diltiazem should be used with caution in patients with cirrhosis as the half-life of the drug may increase. Contraindications to diltiazem include second- or third-degree AV block, heart failure with reduced ejection fraction, severe hypotension, cardiogenic shock, ventricular tachycardia, or atrial flutter associated with accessory bypass tract (e.g. Wolf-Parkinson-White syndrome), and sick sinus syndrome except in the presence of a functioning ventricular pacemaker. Diltiazem should not be administered concomitantly with IV beta blockers due to the possibility of hypotension or AV block. Common adverse events reported with IV administration include bradycardia, hypotension, flushing, and itching or burning at the injection site.

Drug selection should be based on patient specific factors and individual drug properties. If the patient is on a beta blocker or calcium channel blocker as a home medication, the same drug class should be continued for acute management. For those not already on rate control, the following should be considered. Metoprolol is recommended to slow ventricular response in patients with heart failure with reduced ejection fraction (HFrEF) due to its favorable effect on morbidity and mortality in patients with systolic HF.¹ Metoprolol is also recommended for AF in the setting of acute coronary syndrome (ACS) with no hemodynamic instability or bronchospasm to reduce myocardial oxygen demand. While propranolol is the preferred beta blocker for thyrotoxicosis, metoprolol may also be used to control ventricular rate with AF complicating thyrotoxicosis. Diltiazem is preferred in patients with pulmonary diseases to mitigate the risk of bronchospasm and is not recommended for patients with HFrEF because of its negative inotropic effects. For patients who have heart failure with preserved ejection fraction, either metoprolol or diltiazem can be used.

AF is a common dysrhythmia with increasing prevalence in the aging population. Proper diagnosis and management are crucial to avoid further complications. Evaluation of the primary cause of AF should be assessed first to rule out other etiologies that need to be addressed. In the hemodynamically stable patient, pharmacologic therapy can be pursued with the agent of choice determined by patient-specific characteristics and drug properties.

Table 1:

Drug	Mechanism of Action	Dose	Pharmacokinetics	Contraindications, Adverse Effects
Metoprolol	Beta ₁ -selective adrenergic receptor blocker Decreases sympathetic activity Prolongs AV node conduction	IV: 2.5 to 5 mg (higher doses of 10 mg may be reasonable) over 2 minutes Repeat dose every 5 minutes as needed x 3 doses Maximum total dose: 15 mg	Onset: 5 minutes Duration: 5 – 8 hours Half-life: 3 – 4 hours Metabolism: Hepatic	CI: Second- or third-degree heart block AE: Bradycardia, hypotension, dizziness
Diltiazem	Non-DHP calcium channel blocker Inhibits calcium influx during membrane depolarization of cardiac & smooth muscle Slows ventricular rate & AV nodal conduction	IV: 0.25 mg/kg over 2 minutes (~ 20 mg) over 2 minutes Repeat dose of 0.35 mg/kg (~ 25 – 30 mg) if response to first dose is inadequate	Onset: 3 minutes Duration: 1 – 3 hours Terminal half-life: 3.4 hours Metabolism: Hepatic	CI: Second- or third-degree AV block, HFrEF, severe hypotension, cardiogenic shock, ventricular tachycardia AE: Bradycardia, hypotension, flushing

DHP = Dihydropyridine, AV = Atrioventricular, HFrEF = Heart failure with reduced ejection fraction, CI = Contraindications, AE = Adverse effects

Patient Case:

1. You are responding to a call for a 58-year-old female complaining of palpitations. Past medical history includes HFrEF (ejection fraction 30%), atrial fibrillation, and diabetes mellitus type 2. Vital signs are: HR: 167 bpm, RR: 18 rpm, SpO₂: 96% on room air, T: 36.7°C, BP: 124/75 mmHg. After further assessment, the patient mentions she has not been able to pick up some of her “heart medications” at the pharmacy (she is unsure of the names but knows one helps keep her heart rate down). She reports missing doses for the last three days. She has been compliant in taking apixaban 5 mg twice daily. Suspicion of AF with RVR is confirmed on a 12 lead EKG. Is pharmacologic therapy appropriate for this patient? If so, what medication(s) would you use?

Answer: In this scenario, pharmacologic therapy is appropriate. The patient has a history of AF and HFrEF. She is currently hemodynamically stable but has missed 3 doses of her heart/ rate control medication which likely include metoprolol (as calcium channel blockers are contraindicated in HFrEF). This is likely why the patient is no longer rate controlled. An initial dose of metoprolol 5 mg IV administered over 2 minutes with repeat doses every 5 minutes as needed (maximum 15 mg) would be appropriate for this patient.

2. You are responding to a call for a 63-year-old male for shortness of breath, cough, fatigue, and chest pain. On scene, the patient is ill appearing. Vital signs are: HR: 143 bpm, RR: 24 rpm, SpO₂: 93% on room air, T: 39.3°C, BP: 90/56 mmHg. After further assessment, the patient continues to complain of chest discomfort and feeling like his “heart is beating funny.” Past medical history includes diabetes mellitus type 2, hypertension, and obstructive sleep apnea. Suspicion of AF with RVR is confirmed on a 12 lead EKG. Is pharmacologic therapy appropriate for this patient? If so, what medication(s) would you use?

Answer: Medication therapy to control AF with RVR is not appropriate in this situation. Based on the patient's appearance and vital signs, sepsis is highly likely and may be the primary etiology of AF with RVR in this case. Appropriate fluid resuscitation and the underlying infection should be addressed first. Attempting to treat AF RVR without addressing the underlying cause is less likely to be successful and may harm the patient.

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BSI, Scene is Safe

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For decades, “BSI, scene is safe,” is likely the most repeated sentence fragment across New York state in EMT courses. Equal parts improper grammar and useless platitude, it seemingly serves the sole purpose of avoiding a critical fail in the practical skills stations for the EMT exam. More insidiously it has the deleterious distinction of removing scene safety from where it belongs - in the active and ongoing thought process of EMTs as they work their way through every single scenario. You state the phrase, that box is checked, and you move on. This is an example of “training scars” which are harmful practices that can be unintentionally developed during training. An example from law enforcement training would be if you were to always teach recruits to immediately return their pistol to the holster after every course of fire during firearms training, you could inadvertently ingrain that habit. If the officer was involved in a situation where he had to fire his weapon, he might immediately return the gun to its holster rather than keep covering the target while assessing whether the threat had been neutralized.



Most EMS providers have been involved in situations where they realized too late that they did not focus enough on scene safety or missed something that did, or could have, led to being harmed. Working as a police officer, I once responded to an individual who was severely beaten during a home invasion robbery. EMS responded, treated the man in his basement where we found him, and transported him. Later, after leaving the house, I was reviewing photos from the scene and noticed a revolver on the floor of the basement within arm's reach of where officers and EMTs were treating the man. Clearly, a serious compromise to scene safety but unnoticed by police officers (including me) and EMTs.

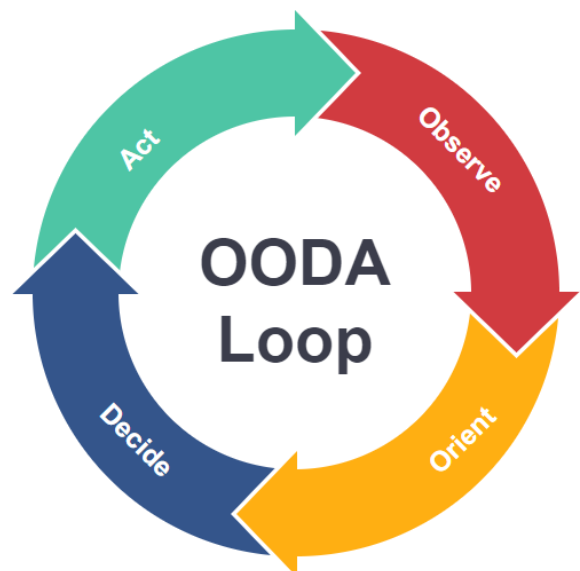
So, how can we be better? First, a distinction needs to be made between scene safety and situational awareness. Here is how I define the two:

Scene Safety - *the precautions you take to mitigate risk.* These precautions might include wearing PPE, wearing your seatbelt, staging while FD or PD clears you in to a volatile situation, always maintaining a plan for egress, rattling a chainlink fence before entering a gated yard, or securing all loose equipment in the back of a moving ambulance.

Situational Awareness - *continuous processing of explicit and subconscious observations to evaluate the risks and threats of your surroundings.*

By combining consistent scene safety practices with maintaining, and responding to, a high level of situational awareness, you stand the best chance of staying safe. Another way to think of the interplay of the two concepts is scene safety is mitigating risk; situational awareness is threat recognition and response. Both concepts require discipline and training. Neither concept receives enough focus in our traditional EMS training methods, meaning most of what we learn about staying safe involves “on the job” training.

When it comes to effective situational awareness I find it useful to focus on a decision-making strategy, developed by Air Force Colonel John Boyd, known as the “OODA Loop”. It stands for Observe - Orient - Decide - Act. The situation I described earlier about the home invasion involved a failure to observe the firearm on the floor. Avoiding tunnel vision and making good observations is the first part of using the OODA Loop. Once you make those observations, you “orient” them within your current understanding of the situation at hand combined with your training and prior experiences. Once oriented, it is time to make a decision, which is where many people freeze. You might decide the risk is not significant enough to require any further action or you might need to take immediate steps to mitigate the risk. However, lack of action should be based upon making an informed decision - not because you failed to observe, orient or decide. After performing the action, it is time to start over again with more observations which will allow you to evaluate the effectiveness of your previous decisions and to identify new risks.



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Understanding the OODA Loop can be an effective strategy for consciously addressing situational awareness but can also be used to interrupt a potential aggressor from acting. Envision an unstable psych patient or an unstable person under the influence of alcohol or drugs. As you do your assessment you get the feeling the patient could become aggressive and uncooperative. Consider that even though your patient is likely unaware of the OODA Loop, he will go through that process, or a similar one, to determine his next course of action. If you are able to interrupt him from completing the OODA process, you might prevent him from performing a violent or unhelpful act. Sometimes interrupting the loop is as simple as redirecting the patient's attention with a question, or with a quick series of questions. Or, you might divide his attention by requesting he responds verbally while completing a physical task associated with assessment. By not giving the person the mental space to orient, decide, or act you could prevent violence or harm. Just keep in mind breaking the OODA Loop is one strategy and it isn't an appropriate approach for all psych patients or patients who are under the influence. Often, those patients require time to think, process, and respond. I am suggesting using this strategy of breaking the OODA Loop specifically in those situations where you believe your patient is planning a harmful action. It can be especially effective in buying you time until additional resources, like law enforcement, arrive.

Going home safely at the end of a shift requires more than frequently repeating "BSI, scene is safe". There are many excellent EMS instructors across our region who strive to teach students effective strategies for scene safety. There are also many EMTs who carry training scars that add to the dangers they face while working in EMS. By nourishing routines and habits that mitigate risk ("scene safety") and continuously processing the risks and threats of your surroundings ("situational awareness"), you put yourself in the best position for years of continued, safe service.
