

# DPM NEWS

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## New Faculty Member at DPM

On *page 2*, meet Dr. Tyler Lemay who we are pleased to have join us at DPM.

## AEIOU - TIPS

Dr. Cushman breaks down the utility of a differential diagnosis and reviews a great mnemonic device for prehospital providers on *page 3*.

## Blades of Glory

Dr. Galton reviews a study from France on the efficacy of laryngoscope blade size during intubations. Is bigger always better? Check it out on *page 5*.

As we roll into another school year, flu-season, football season, autumn, or however you choose to designate this time of year, I find myself reflecting on certainty. Throughout the past year or two we have all been exposed to predictions and thoughts on what future Septembers and Octobers will look like from physicians, public health officials, and medical communicators with varying degrees of certainty. Now that another fall has arrived I am struck, but not surprised, by how different reality appears from those predictions - especially the most certain ones. When I was getting a degree in physics, measurements and results in labs were ALWAYS associated with a numerical value for uncertainty. Sometimes, calculating the uncertainty was a more onerous task than calculating the actual result of the experiment. It would be convenient if every prediction, especially those in medicine which can have massive implications for public health policy or an individual's treatment decisions, also came with a value for uncertainty. While these types of predictions aren't conducive to an uncertainty calculation similar to the lab value derived in a controlled environment, perhaps a rolling uncertainty could be established based on the accuracy of previous predictions for which the values are now known. I'm reminded of a quote from a Yeats poem, "The best lack all conviction, while the worst are full of passionate intensity." While that quote refers to an individual's innate goodness, it strikes me as useful to apply the phrase "best" and "worst" to mean best and worst predictors of the future where it helps serve as a warning - passion (or publicity) bears no correlation to correctness.

*Eric Rathfelder*  
*Editor-In-Chief*

## Upcoming Events

*Melinda Johnston*

For more information about any event listed below, please visit the training calendar at [MLREMS.org](http://MLREMS.org)

### **October**

6 - 9 - Pulse Check Trade Show

10 - Journal Club

17 - REMAC Meeting

17 - REMAC Case Conference

22/23 - CLI Original

### **November**

12 - CIU

21 - MLREMS Council

### **December**

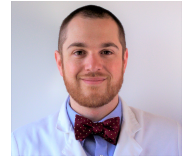
19 - RSI Case Review

19 - REMAC Meeting

## Introducing Dr. Tyler Lemay

Tyler Lemay has joined the Division of Prehospital Medicine at URMC as a faculty member and we are very excited to have him as part of the team!

You may have met him during the past four years or so when he was working at Rochester Regional as an Emergency Medicine physician at the RGH adult and pediatric ED and at Newark Wayne Hospital. He grew up in Vermont working in various fire and EMS positions before graduating from medical school at UVM in 2015 which was followed by a residency in North Carolina. Dr. Lemay is married and, when he isn't chasing after his five year old son, he enjoys biking and skiing. Feel free to introduce yourself and reach out to him with any challenging cases or medicine-related questions!



## Differential Diagnosis and Seizures

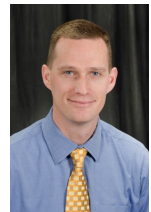
*Jeremy T Cushman, MD, MS, EMT-P*

Many of the docs will use the phrase "Differential Diagnosis" a lot since it's a term that physicians use when we evaluate a person's complaint and begin entertaining the various different possible causes of that complaint. Its use is not strictly limited to physicians, however. Each one of us as EMT's and Paramedics use a similar process when evaluating a patient.

Strictly speaking, a differential diagnosis (I commonly use the shorthand "DDx") is the process of weighing the probability of one disease versus that of other diseases possibly accounting for a patient's illness. More simply, it's coming up with a list of things

that could be causing the patient's presentation. Importantly, the initial DDx is purposefully very broad and as additional information is obtained about the patient, their history, or certain exam findings, that DDx narrows. The purpose of such a broad list is to assure that we do not "narrow" our focus prematurely. If I don't think of it as a potential cause of the patient's complaint, then I am certainly not going to diagnose it.

We can begin to think about the DDx on the way to the call simply by knowing the nature of the call. Let's use the example of being dispatched for a reported seizure. On the way to the call, I start thinking about a mnemonic that we can use to help us think of the different causes (the DDx) of seizures (and really any type of altered mental status for that matter). I'll share that "AEIOU-TIPS" mnemonic here along with the various causes of seizures that it helps remind me of (see next page):



- A** – Alcohol (Specifically alcohol withdrawal or toxic alcohols); Anoxia (no oxygen)
- E** – Epilepsy; Electrolytes (hypernatremia and hyponatremia in particular)
- I** – Insulin (Hypoglycemia); Idiopathic (meaning we have no idea – my personal favorite)
- O** – Overdose (of many medications)
- U** – Underdose (not taking their regular anti-seizure medications); Uremia (elevated BUN)
- T** – Trauma (head injury); Tumor
- I** – Infection (meningitis); Fever (so it doesn't start with 'I' but you know what I mean)
- P** – Psychogenic; Pregnancy (eclampsia)
- S** – Stroke; Subarachnoid Hemorrhage

As you can see, within this list there are a number of causes that by simply doing a history and a physical exam focused on the DDX, we may be able to further narrow that list. For example, we can assume some causes of a seizure are significantly less likely if the patient is a male (pregnancy) with no history or signs of injury (trauma) and no past medical history (underdose, insulin), who was feeling well and without recent illness (infection, fever). He is 19 years old (making stroke unlikely) but based on your astute DDX skills you dig deeper and ask him some other questions about medications only to find that he had taken some of his friend's bupropion because he has been feeling depressed. Interestingly, bupropion (an antidepressant) can lower the seizure threshold making seizures more likely.

The point here is obviously to consider a very broad DDX that is based on the patient's complaint, then use that DDX to ask questions that may allow you to narrow that DDX. As a prehospital practitioner, it's also really important that I include things that are more likely to kill the patient if I don't pick up on them. For example, psychogenic causes of seizures may be an absolute possibility, but rarely kills anyone; while hypoglycemia absolutely can. Don't lose track of those things that can hurt your patient if we don't pick up on it. If you don't start with a large differential – particularly one that includes things that might hurt your patient if you miss them - you might miss some simple questions that can easily break the case. Try it next time!

## Is There a Correct Blade Type and Size?

*Christopher Galton MD, NRP, FP-C*

This is a question that I am asked consistently as an anesthesiologist. The other version is "do you have a favorite blade?" My answer is always the same and probably annoys the people that ask me. The canned answer is "it depends on the patient." The caveat that follows is "but we should all be comfortable with all the blades and sizes if we expect to call ourselves experts."

To some, that probably sounds like a bunch of baloney. Many of our colleagues feel that using the bigger blade to intubate patients, whether it's a Miller or Macintosh, is always the right answer because you never have to size up. While that might be true in rare circumstances when a person under six feet tall requires a larger blade, I have always held the opinion that using the smallest blade possible leads to improved precision, reduced collateral injuries, and increased success with instrumentation of the airway.



Those opinions are anecdotal and founded after many years of intubating and watching others perform intubations. Someone recently asked me if I have personally intubated or watched people intubate more patients? Although there is no way to query all the airway management situations I have been involved with over the years, it is probably coming up on 20,000 by now. If you are willing to accept me as an airway expert, then it may surprise you to hear that easily more than half of those are as a supervisory physician and not the clinician with the blade in my hands. When you watch thousands of intubations with lots of people doing different things, you learn that there is a lot of blade hanging out the mouth almost every time a clinician has a Miller 3 or Mac 4.

The goal of proper blade sizing is to have the blade handle nearly or very gently touching the lips of the patient. If there is too much blade hanging out the mouth, then your ability to manage the tip of the blade is reduced. I would liken this to placing your 14 gauge IV catheter. For the average patient needing large bore access, we would all prefer to place a catheter that was 1.25" long instead of a 3.5" long catheter. Our ability to handle the catheter with enhanced precision is improved with the shorter catheter. Similarly, our ability to place and properly manage the laryngoscope blade is significantly improved with shorter blades.

A recent article in *Intensive Care Medicine*, which is a respectable critical care journal, caught my attention. It is titled "Impact of Macintosh blade size on endotracheal intubation success in intensive care units: a retrospective multicenter observational MacSize-ICU study". The article looked at 2139 intubations in French ICUs. The design is a bit strange because it encompasses three different time periods, but the article tries to answer the question of whether you are more likely to successfully intubate a patient with a Mac 3 or Mac 4. The clear winner was the Mac 3. That was despite similar CL views with both blades. To translate, even though you can get a similar view with both blades, the airway is much easier to instrument with the smaller blade. In mild, moderate, and severe categories of complications, the rates were higher in patients intubated with a Mac 4 blade. They looked at real complications like esophageal, laryngeal, and dental injuries, aspiration events, arrhythmias, hypoxemia, cardiovascular collapse, arrest, and death. Unfortunately they were not able to achieve statistical significance in any of the categories.

I would encourage you to read the article, which can be found at: <https://rdcu.be/cWPUr>. I would certainly agree that comparing EMS to ICU intubations is not perfect and the study has some interesting nuances, but it is hard to argue against the first pass success rate that the Mac 3 yielded compared to the bigger blade. If you still think about pulling out bigger blades for every patient after you read this piece of literature, it's time to get reading glasses and probably time to ask yourself why you are practicing against expert opinion and contemporary data sets. Do the right thing, improve your first pass success rates, and stop hurting people.

If you have any questions about this article, please feel free to reach out to me at [christopher\\_galton@urmc.rochester.edu](mailto:christopher_galton@urmc.rochester.edu).

*Godet, T., De Jong, A., Garin, C. et al. Impact of Macintosh blade size on endotracheal intubation success in intensive care units: a retrospective multicenter observational MacSize-ICU study. Intensive Care Med 48, 1176–1184 (2022). <https://doi.org/10.1007/s00134-022-06832-9>*

## Hypertension

*Jeremy T Cushman, MD, MS, EMT-P*



I'd guess that probably half of our patients have it listed as a medical problem, and probably even more have it when we take their vital signs. But what exactly is the definition of hypertension and when should we be worried about it?

So we all know what “normal” blood pressure is: the classic 120/80. “Pre-Hypertension” is defined as either systolic or diastolic consistently between 120/80 and 140/90. Management of “Pre-Hypertension” is generally geared towards diet, exercise, smoking cessation, and weight loss and rarely is accompanied by management with medications. In the emergency setting, we essentially ignore this classification completely as it is clinically irrelevant for what we do. “Hypertension” is defined as a systolic or diastolic value greater than 140/90 most of the time. Generally this is determined by 3 or more values obtained on different dates and times. As you know, hypertension is a risk factor for coronary artery disease, strokes, and renal disease among others.

Technically, any patient with a BP of 140/90 or greater is “hypertensive.” So when would we worry about someone with an elevated BP? Simple – only when they are having symptoms of “end-organ dysfunction”. What symptoms are those? Obvious ones, such as those consistent with a myocardial infarction, stroke, sudden vision loss, or acute renal failure (obviously that last one we can't figure out in the field too well but I know you can pick up on the other ones!).

Someone with asymptomatic hypertension requires no emergent treatment. In fact, rapid lowering of blood pressure in someone that is markedly hypertensive without symptoms does more harm than good as the vasculature has essentially compensated for that sustained increase in blood pressure and a sudden decrease can cause areas of ischemia when there is suddenly a decrease in blood pressure. Even in those with “end-organ” symptoms such as stroke, sudden vision loss, or an MI, we have to lower their blood pressure slowly and carefully, and cannot allow it to drop too fast or it can cause harm.

So, with this information, what do you do with a patient whom you assess and find to be hypertensive? Simple – complete your assessment. If there are no concerns for “end organ dysfunction” such as stroke, MI, or sudden vision loss based on history and exam, you don't need to do anything. Really. They can be transported very safely to the hospital BLS. In these cases ALS, or even a physician in the hospital, are not going to emergently treat the elevation in blood pressure. You can manage any other underlying concerns they have but there is no specific management or need for additional prehospital evaluation for someone that is asymptomatic with an elevated blood pressure.

I know what you are thinking – “but Doc, their BP was 230/115!” And my answer is going to be the same. If they are asymptomatic, then there is no specific need for ALS and transport can be made BLS. Obviously if that's their blood pressure and they are having facial droop and arm weakness, then that would be an indication to request ALS (if not already requested), but asymptomatic elevations in blood pressure are an appropriate BLS transport.