

DPM NEWS

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Medications

In the first few pages, Dr. Farney answers a couple of provider’s questions related to ketorolac and epinephrine and our protocols.

Mental Capacity

Dr. Lemay and I provide articles starting on page 5 that provide more questions than answers about mental capacity, consent, and compelled transport.

Hypothermia

Dr. Rueckmann reminds us about important considerations for the treatment of hypothermia on page 9.

It is once again time to recognize the great work done by your colleagues, employees, and supervisors in the EMS profession. MLREMS awards nominations are due February 1, 2025. The nominations packets can be found at MLREMS.org by searching for “Award Nomination Packet 2024”.

I hope you find this edition of DPM News valuable and, as always, if you have topics that are of interest to you or articles you would like considered for publication, please reach out to me at eric_rathfelder@urmc.rochester.edu.

Eric Rathfelder
Editor-In-Chief

Medication Questions/Updates

Aaron Farney MD, EMT-P



Protocol question: ketorolac in the elderly

A recent case left a clinical team reviewer wondering why ketorolac administration is restricted by protocol in the elderly.

The case (details modified to protect privacy)

A BLS ambulance is dispatched for the 70-year-old male with atraumatic severe back pain. He relates a recent diagnosis of a herniated disc. He is

complaining of severe, 10/10 low back pain radiating down his left leg after attempting to lift a suitcase. It is worse with movement, better in a position of comfort.

On exam, his vital signs are notable for moderate hypertension but are otherwise within normal limits. He is neurologically intact. He is well in appearance, but in obvious pain.

The EMT places the patient in a position of comfort and applies a hot pack. However, the patient continues to have uncontrolled severe pain, so the EMT asks the patient if he would like him to call a paramedic for IV analgesia. The patient replies “Yes, but I do not want any opioids...do they have anything else?”

The EMT calls the closest available paramedic and discusses the case by phone. The paramedic advises that although she carries ketorolac, it is contraindicated due to patient’s age. While she offers opioids, the patient declines, and is ultimately transported BLS. His pain remains 10/10 for the duration of prehospital care.

The case was subsequently reviewed by the clinical team, who wondered, why is ketorolac contraindicated in the elderly? Here is the question sent to me:

“I have read a few studies that mention a mild risk of later GI bleeding but found no other significant risks, aside from avoiding it in renal patients. Could you provide any insight into the rationale behind the age restriction for Toradol?”

Per the NYS Collaborative Protocols, ketorolac should not be administered in patients older than 60. But why?

Ketorolac is a potent NSAID that can exacerbate underlying renal dysfunction. The elderly have decreased creatinine clearance and an increased risk of underlying renal disease, and therefore are at increased risk of ketorolac-induced kidney injury and/or toxicity. This stems in part from higher prevalence in the elderly of hypertension and diabetes, which are the leading causes of renal disease. Many elderly patients whom EMS encounter also have acute kidney injury, often from dehydration and/or sepsis. Of particular concern are patients with advanced renal disease (CKD stage III, IV, or V). A single dose of ketorolac might be harmful in these patients.

Without the ability to review a recent creatinine, or to obtain a reliable point-of-care creatinine, paramedics must exercise significant caution prior to administering ketorolac in patients with high risk of renal disease, such as the elderly. For this reason, the authors of the NYS Collaborative Protocol selected age > 60 as the cutoff for standing order ketorolac. While there is some debate as to whether age 65 would be more appropriate, my understanding is that the authors selected 60 out of an abundance of caution.

To be clear, age > 60 is not an absolute contraindication to ketorolac administration. Creatinine clearance < 30 mL/min is the contraindication – a condition of which the elderly are at increased risk. Calculation of creatinine clearance requires age, weight, and current serum creatinine level, the latter not being routinely available to EMS.

Pain Management – Adult	
CC	
PARAMEDIC	
	<ul style="list-style-type: none"> • May choose one:[†] <ul style="list-style-type: none"> ○ Ketorolac⁴ (Toradol) 15 mg IV/IM ○ Acetaminophen² 1000 mg IV over 15 minutes[Ⓟ]
Key Points/Considerations	
	<p>4 Ketorolac (Toradol) should not be administered in patients with:</p> <ul style="list-style-type: none"> ○ Renal failure ○ Require dialysis ○ Are >60 years of age ○ Pregnant ○ Are actively bleeding ○ Are presenting with chest pain or a suspected acute coronary syndrome

Back to our case. Unfortunately, ketorolac is not a great option. Our patient is 70 and accordingly has increased risk of underlying renal dysfunction. If equipped and trained, IV acetaminophen would be a reasonable alternative to opioids for this patient.

References

1. Collaborative Advanced Life Support Adult & Pediatric Patient Care Protocols. Bureau of Emergency Medical Services and Trauma Systems. Version 24.1. Effective 07.01.2024. https://www.health.ny.gov/professionals/ems/pdf/ny_collaborative_protocols_v24.1.pdf
2. Mayhew et al. "Ketorolac." StatPearls. National Library of Medicine. Updated February 28th, 2024. <https://www.ncbi.nlm.nih.gov/books/NBK545172/>

Protocol question: Epinephrine in anaphylaxis

An astute paramedic recently sent me the following question:

*"I was reviewing the new Allergic Reaction / Anaphylaxis protocol and noted that the old protocol order for ALS providers to administer **"repeat (epinephrine) every 5 minutes if these symptoms persist"** is now removed and it looks like we're limited to the EMT level of epinephrine x2 at most on standing order. I was just wondering if this was intentionally changed or if something was accidentally left out? I just don't recall hearing anything about this change in treatment."*

The previous (2023) NYS Collaborative Protocol iteration included an order for Advanced and higher to administer epinephrine every 5 minutes if anaphylaxis persists, without a dose number limit. That order is now gone. Why?

[NYS Bureau of EMS & Trauma Systems Policy Statement 24-02](#) summarizes the changes from the 2023 protocols to the 2024 protocols. Per 24-02: *"Removed administration of IM epi from AEMT section as it is under all providers."*

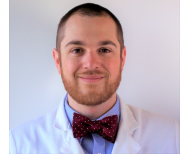
Anaphylaxis and Allergic Reaction – Adult	
CFR AND ALL PROVIDER LEVELS	
If severe respiratory distress, facial or oral edema, and/or hypoperfusion	
OR	
If patient has a <i>history of anaphylaxis</i> and has an exposure to an allergen developing respiratory distress and/or hypoperfusion and/or rash:	
<ul style="list-style-type: none"> ○ Epinephrine (1 mg/mL) 0.3 mg IM¹¹ ○ If the patient does not improve within 5 minutes, may repeat once 	
MEDICAL CONTROL CONSIDERATIONS	
<ul style="list-style-type: none"> • Additional Epinephrine for levels with limited standing orders 	

Suspecting this was an unintentional consequence of streamlining the protocol, I reached out to the protocol authors for clarification on the change. Indeed, that was the case – no one intended for a paramedic to have to call medical control for authorization for the third dose. *However*, if you find yourself drawing up a third dose of epinephrine to treat refractory anaphylaxis, it would be wise to speak with online medical control regardless. This is a rare circumstance – I can count on one hand how many times (outside of a code) I've had to give three or more doses of epinephrine for anaphylaxis, and they were all bad situations. At this juncture, it's also time to consider an epinephrine infusion. Again, this is a rare circumstance.

Bottom line: In spirit, there is no intended requirement for a paramedic to call for a third dose of epinephrine. But it is wise to engage online medical control in this situation. They can help navigate management of these critically ill patients.

References

1. Collaborative Advanced Life Support Adult & Pediatric Patient Care Protocols. Bureau of Emergency Medical Services and Trauma Systems. Version 24.1. Effective 07.01.2024. https://www.health.ny.gov/professionals/ems/pdf/ny_collaborative_protocols_v24.1.pdf
2. Collaborative Protocol Change Log Version 24.0 Effective 07.01.2024. Bureau of Emergency Medical Services and Trauma Systems. Issued April 12th, 2024. <https://www.health.ny.gov/professionals/ems/pdf/24-02.pdf>



Evidence Update: Intranasal ketamine for trauma?

A [recently published paper](#) exploring the efficacy of low-dose analgesic intranasal (IN) ketamine in trauma was pushed my way by my colleague Dr. Cushman. The study, out of Cincinnati, examined whether the addition of 50 mg IN ketamine (50 mg/mL) to a standard dose of fentanyl improved pain scores for adult male patients with severe (7-10/10) acute traumatic pain compared to just standard fentanyl alone. One group received actual ketamine, the other saline. Both groups received a standard dose of fentanyl. Neither the patients nor the paramedics knew who received ketamine vs. saline as the second drug.

Spoiler alert: IN ketamine did not help. 192 patients were enrolled - there was no meaningful additional analgesic benefit of administering 50 mg IN ketamine compared to just standard dose fentanyl. This study is of sufficient design to conclude that IN ketamine, at a dose of 50 mg, does not help with pain control for acute traumatic injuries in adult men.

Why? While 50 mg IV ketamine would certainly provide analgesia (and frankly borderline dissociation in some patients), this study suggests that IN absorption of ketamine is poor. Perhaps a higher dose would be effective, although the optimal IV to IN conversion ratio is somewhat elusive, particularly when aiming for the therapeutic analgesic window without crossing the dissociation threshold.

The bottom line

IN ketamine is not currently in the NYS Collaborative Adult Pain Management Protocol. This study supports that.

References

1. McMullan et al. "Out-of-hospital intranasal ketamine as an adjunct to fentanyl for the treatment of acute traumatic pain: a randomized clinical trial." *Annals of Emergency Medicine*. Published June 12th, 2024. <https://www.sciencedirect.com/science/article/pii/S0196064424002294?via%3Dihub>

Mental Capacity Considerations

Tyler Lemay MD, NRP

You're called to the 'MHA' and find a 22 year old woman with police, adamantly refusing transport. She was involved in an altercation and has obvious injuries to the head and left arm, slurred speech and smells of alcohol. She is alert but disoriented to place. The police don't believe she meets criteria for 'MHA' and suggest you should sedate and restrain her to get her 'checked out.' Can she refuse vital signs? Examination? Transport?

Capacity is the key to so many decisions we make in EMS. Can a patient recently saved from opioid overdose refuse transport? If they have capacity! Can the family member/ health care proxy decide if Grandma should go get checked out? Only if they lack capacity! Can the patient who crashed after suspected sedative overdose refuse vital signs? It depends on their capacity. So let's review who has capacity, who doesn't and when it matters.

First, the exceptions - In the United States most adults can make most of their own decisions, including decisions about their health and welfare. But there are a few groups that require input from their healthcare decision makers:

1. Children. Under the age of 18, parents or legal guardians can make most healthcare decisions. Exceptions are made for sexual and reproductive health in most states, New York included. For example, a 17 year old in a car crash requires parental consent for treatment OR for refusal - but a 17 year old who suspects she is pregnant doesn't.
2. Patients who lack competence. Capacity is a temporary evaluation of someone's current ability to make a specific decision, but the courts can make a permanent decision and deem someone incompetent. These patients have a legal guardian just like children who should be consulted for medical decisions - often this is a family member but this can be a government employee for patients with intellectual disability or in state care.
3. Patients whose psychiatric health or substance use is immediately dangerous. These are the patients transported via 9.41, 9.45 and 22.09. Neither EMS nor most Emergency Physicians are able to force these transports but we often advocate on our patient's behalf.

For the remainder of our patients, we should constantly be asking the question - can this patient understand and make an informed decision about this healthcare decision? Capacity is relevant to each individual decision patients make, and can change with time or different decisions. Most of the time a simple conversation and the patient's permission are adequate, but for cases that are less clear we need to assess the four elements of capacity:

1. Can the patient understand the information needed to make this decision?
2. Can they weigh risks, benefits and alternative options?
3. Can they communicate their decision and thought process clearly?
4. Is their decision logical and consistent with their values and preferences?

Thinking of the case above, this patient *might* have had capacity to refuse transport yesterday. But if her intoxication and current mental state prevent her from making a rational decision based on her values and preferences today, then she can't make that decision. *Alternatively* she might admit to alcohol use, be slurring her words and fail a field sobriety test, but if she can demonstrate that she understands what

happened, what you're recommending, communicate her preferences and reason through the decision she likely *can* refuse! So how do we assess for capacity? We talk with our patients!

Most capacity discussions start when a patient refuses treatment or transport, so I often start the conversation asking "Tell me why you don't want to go to the hospital today." (#4) I'll ask what happened today or why the ambulance was called to assess their understanding of their situation (#1). I'll engage them in a conversation about other options and what might happen if they refuse treatment or transport (#2) and throughout the conversation pay attention to their language and thought process (#3). Ultimately this isn't a checklist and it's not an assessment for Alert and Oriented x4 - it's a conversation to help you understand what the patient is thinking and how they are making those decisions.

It's often helpful to involve family or friends in the conversation - if Grandma has always said she wouldn't want to go to the hospital, then her refusal today is consistent which suggests #4. A patient with schizophrenia may be refusing an IV despite their STEMI, but if their therapist indicates this is typical for them and the patient can tell you why and what this means for their health, they can likely make this decision. Family will also know if the patient has a guardian, in which case the patient may have preferences but the guardian makes the decisions.

So what to do with the 22 year old patient who was assaulted? After moving her to the ambulance and removing law enforcement from the mix she is able to explain that she wants to get checked out but needs to go to a hospital further away to protect her privacy. She knows you can't bring her that far, and has a friend coming to drive her. She understands the delay increases her risk but tells you that her attacker works at the hospitals in Rochester and her privacy is more important to her than the small chance she gets worse while waiting for her friend. She allows vital signs and examination, signs refusal paperwork and you clearly document that she demonstrated capacity to make this decision. Her friend arrives and agrees to drive her to Noyes and you go back in service.

To review - we assume that most patients will make most decisions for themselves. For high risk decisions or any time we have questions about capacity we assess the four elements above. If patients understand, appreciate the options, and communicate preferences with a logical thought process they get to decide, even if we disagree. Like so much else in EMS, gather the best information you can, make the best decision with the patient at the center of their care, and document clearly how you decided the patient had (or lacked) capacity. For those challenging cases with no clear answer, there's always an EMS physician available to talk through the case, don't hesitate to call!

The Consensual vs Compelled Transport Conundrum

Eric Rathfelder MS, EMT-P

As Dr. Lemay explains in the article above, doing an evaluation of your patient's decision-making capacity is important for your treatment and transport decisions. But what happens when your patient lacks decision-making capacity at a scene? Do you revert to the old, "we can do this the easy way or the hard way?" Or, "you can get on the stretcher and take a quick ride to the hospital or the police are going to make you go." Sometimes, this binary is the reality. And other times it is, knowingly or unknowingly, a bluff because the mechanism for law enforcement to compel transport is anchored in the New York State Mental Hygiene Law - not simply based on if a patient has capacity.



MHL 9.41 authorizes a law enforcement officer to, "...take into custody any person who appears to be mentally ill and is conducting himself or herself in a manner which is likely to result in serious harm to the person or others." MHL 22.09 authorizes a law enforcement officer to compel "A person who appears to be incapacitated by alcohol/or substances to the degree that there is a likelihood to result in harm to the person or to others..." to be transported to the hospital. There are other sections of the Mental Hygiene Law you might also be familiar with that law enforcement may facilitate (such as section 9.45) but these are typically at the behest of a mental health provider's request to compel transport. Importantly, both sections involve a two-pronged test - "appearance of mental illness" or "incapacitation by alcohol/or substances" AND conduct likely to result in "serious harm" or "harm". Oftentimes, situations meet one of the two prongs but not both, leaving a rather large gray area between the EMS standard of transporting those who lack decision making capacity and the law enforcement standards outlined by the Mental Hygiene Law.

Let's look at some situations that don't fit neatly into consensual transport or a compelled transport under MHL since, in my experience, these are the situations likely to result in frustration and conflict.

Situation 1: EMS is dispatched to a 60 y/o male having crushing chest discomfort. The patient's wife called 911. As the paramedic, you evaluate the patient who is alert & oriented, hypotensive, diaphoretic, and tachycardic. An EKG reveals an active inferior wall MI. You explain the serious nature of this medical condition to the patient and why it is imperative for him to be treated at the hospital. He appears to understand the gravity of the situation and persistently declines transport or further treatment. You request police to the scene and put the patient on the phone with a medical control physician while you're waiting for their response. The patient hangs up with the doctor, still unconvinced. Police arrive and have no better luck with getting the patient to agree to be transported.

Discussion: You have made significant efforts to make sure this patient is informed and employed numerous other parties (presumably the patient's wife, the medical control physician, and law enforcement) to attempt to resolve the situation. You might try getting the patient in touch with his own physician but this patient seems pretty adamant about declining transport which, in this situation, absolutely comprises conduct "likely to result in serious harm to the person" BUT your patient does not appear to be mentally ill or "incapacitated by alcohol/or substances". Therefore, this patient does not meet the criteria for compelled transport under MHL by police and this patient is entitled to make his own choices in regards to his medical care.

Situation 2: Police and EMS are dispatched to a third party call for the intoxicated female not feeling well. You find a 30 y/o female complaining of flu like symptoms. She is alert but mildly confused presumably from her intoxicated state. Her boyfriend, the caller, is sober and home with her. After completing your assessment you conclude she is intoxicated and suffering from some type of virus. She is insistent that she will not be transported to the hospital. Due to the fact that she is confused from her intoxicated state, you determine she lacks decisional capacity and inform her she has no choice but to be transported to the hospital. She physically and verbally refuses transport. You request the police officers to compel her to be transported to the hospital and one of them tells you that he doesn't believe she is either "incapacitated" by alcohol nor does he believe there is "likelihood to result in harm" to herself or others. The officer does not interpret this situation as meeting the criteria for a mental health detention under 22.09.

Discussion: You are stuck in the the space between where you are reasonably able to complete a sign off (patient lacks capacity) but the mechanism law enforcement uses to compel transport, a mental hygiene detention, is not an option. Yikes! You can't forcibly kidnap the patient and you can't force the officers to make a different decision. Unfortunately, there are many patients that fall into this gap and MOST of the time we are able to work something out to achieve a good outcome but sometimes that requires a lot of patience and some ingenuity. Importantly, it's helpful to keep in mind the parameters you don't have the power to change (that these officers won't be compelling a transport) and get creative and persistent within those parameters. If transport does not occur, be sure to thoroughly document all of your efforts and findings. Also, remember that the officers Body Worn Cameras (BWCs) are likely recording so be mindful of your recollection when completing your chart.

Situation 3: You and your partner respond to the police station for a 24 y/o male who is under arrest. Officers tell you he is having trouble breathing. After evaluation you determine he is having an asthma attack which requires a nebulizer treatment and IM epinephrine. He is stabilized but you tell the patient he really needs to be evaluated at the hospital. He is alert and oriented and refuses transport.

Discussion: This patient is in the custody of the police department and can be compelled by the officers to be transported to the hospital. Ultimately, he may refuse additional treatment at the hospital but after you explain to the officers why the patient's life could be in jeopardy if he isn't treated at the hospital, they facilitate getting him on the stretcher and off to the hospital.

Situation 4: You respond to the scene of an assault in the street. Upon arrival you are directed to a patient who has been beaten with some type of blunt instrument. The fire department tells you that when they arrived the patient was unconscious but has since become responsive and is sitting on the curb. He is bleeding from lacerations to the face and head and has a large hematoma on the back of his head. It does not appear he is under the influence of drugs or alcohol but he keeps repeating questions and asking what happened. You suspect some type of head injury. You explain to the patient your differential diagnosis and that he will need to be transported to a trauma center for treatment. He initially agrees but then becomes confused and refuses transport. Frustratingly, you continue to have the same conversation with him repeatedly and don't seem to be making any progress towards getting to the hospital. You ask the officers investigating the assault to compel the patient to be transported to the hospital. They understand the potential risk to his life if he does not receive higher level care but tell you that because he does not "appear to be mentally ill" and is not "incapacitated by alcohol/or substances" that he doesn't meet the second part of a 9.41 or 22.09 and they cannot compel him to be transported.

Discussion: This patient lacks decisional capacity from a medical standpoint and has a potentially life-threatening head injury. In the interpretation of the law enforcement officers at the scene, he does not meet the criteria for a mental hygiene detention. Here is a classic scenario where there really should be another legal mechanism for law enforcement to compel transport in a case where the patient clearly meets the standard of implied consent. However, especially in the current political, prosecutorial, and litigious climate, many officers are understandably hesitant to take a person into custody or physically restrain a patient without a very solid legal standing to do so. This is even more risky for an officer in a situation where a patient is at a heightened risk of death since the officer is looking to avoid being involved with an "in custody death" that will result in a criminal investigation, civil law suit, and negative personal publicity. Therefore, it is very possible this patient will not be forced by the law to be transported. Another tough situation to be in that might require all of your experience, resources, and skills to bring to a satisfactory conclusion.

There are times when in a situation similar to the one above, an officer may make the determination that the head injury, or dementia, or hypoglycemia fall into the category of “appearance of mental illness”. Others will attribute the reduced mental capacity as secondary to a medical problem rather than a mental illness. I can’t speak to the appropriateness of either and certainly not to the legal considerations but I do know scenarios like that outlined in situation four involve high stakes in many dimensions. Resolution could require a step back, a deep breath, and a mindset that all of the first responders are doing the best they can within the parameters they are required to work within. With any luck, your patient will have reconsidered his decision or passed out while you take that breath and you can effectively complete your treatment and transport.

Baby, it’s Cold Outside

Erik Rueckmann MD



It’s that time of year to review what happens when things get cold, really cold. Hypothermia is defined as core body temperatures less than 95 Fahrenheit, or 35 Celsius. At these temperatures, your body can’t function because the enzymes that make aerobic metabolism get gummed up. Hypothermia can be environmental (everyday in Rochester from October to May) or due to disease processes. Take a look at the table below to review things that can cause your body temperature to drop.

Burns	Uremia
Hypopituitarism	Major trauma
Hypoadrenalism	Infusion of cold fluids
Hypothyroidism	Alcohol
Hypoglycemia	Sedatives
CNS injury/tumors	Antipsychotics
Stroke	Oral antihyperglycemics
Sepsis	Beta-blockers

This article will focus on environmental causes of hypothermia, but it’s important to remember that other things can cause your body temperature to be dangerously low (sepsis, head bleeds, thyroid disease, others) and maintaining body temperature will prevent worse outcomes in trauma, stroke, overdoses, etc.

If you are outside in the cold without appropriate gear or submerged in cold water, your body temperature can drop quickly. As your core body temperature drops, your body’s normal function starts to deteriorate, and you begin to see multi-organ failure. The table on page ten could be helpful with grading hypothermia.

This is a good time to signpost that since prehospital care does not have a way to measure core temperature that we need to resuscitate patients and transport them. Patients that you encounter with a pulse that need rewarming should be urgently transported to either URMC or RRH given possible need for internal rewarming.

Patient’s that don’t have a pulse fall into a special category. These patients should be transported to either URMC or RRH with pre hospital notification to ensure the patient can receive internal rewarming interventions like ECMO. This is an example of when transporting a patient in cardiac arrest is indicated along with CPR. It’s important to note that CPR in a moving ambulance is not easy nor safe. It’s important to work with the pre hospital team to ensure quality CPR and provider well-being. NYS protocol signposts only using one round of medications and up to three shocks. The reason behind this is that the normal function of the human body is disrupted by severe hypothermia. The enzymes that carry out thousands of vital processes cannot proceed until normothermia is established and the body’s metabolism slows significantly. Medications also only work under “ideal” conditions and hypothermia

may limit their effectiveness and defibrillation can be ineffective due to the breakdown of metabolic processes due to the cold. The literature documents multiple cases of hypothermic patients that can regain circulation after an hour of active resuscitative efforts with full recovery due to the body's metabolic state.

staging, physiology, and typical therapies of hypothermia					
Severity	Neurologic	Cardiac	Pulmonary	Renal	Typical therapy*
Mild (HT1)* 32-35C 90-95F	Alert, shivering* Ataxia Impaired judgement	Tachycardia Hypertension	Tachypnea Bronchorrhea	Cold diuresis	- Exposure-related: Passive external rewarming (e.g. blankets) - Spontaneous: Warming blanket
Moderate (HT2)* 28-32C 82-90F	Drowsy, non-shivering* Delirium Paradoxical undressing Dilated pupils	Bradycardia Hypotension Atrial fibrillation	Hypoventilation	Cold diuresis	Active external rewarming - Warming blanket - Warmed/humidified air (If possible, fluid being administered should be warmed)
Severe (HT3)* 24-28C 75-82F	Unconscious with pulse* Coma Fixed dilated pupils Areflexia	Heart block Cardiogenic shock	Pulmonary edema Agonal respirations	Oliguria	- Active external rewarming (see above). - If refractory shock or hypothermia, also consider active internal warming (e.g. thoracic/bladder lavage).
Pulseless (HT4)* <24C <75F	Appears dead	Pulseless* - Ventricular arrhythmia - Asystole	Apnea		Active external rewarming plus Active internal rewarming - Ideally: ECMO or cardiopulmonary bypass - Alternative: thoracic lavage

Staging and treatment of hypothermia. The provided temperature ranges generally correlate with clinical findings, but this correlation isn't perfect. When classifying the severity of hypothermia, both the temperature and clinical manifestations should be considered.

* Key clinical features which may be used to stage patients in the field (if immediate temperature measurement isn't available).
* Swiss Staging system for hypothermia.
& Therapy depends on clinical details, response to prior treatments, available resources, and risk/benefit calculus for each intervention. Listed treatments in this column are merely provided to give a general concept of how these patients might often be managed.

-The Internet Book of Critical Care, by @Palmiter

Selected Upcoming Events (see [MLREMS.org](https://mlrems.org) for a complete list)

October 9 - ALS Core Content at CHS

October 9, 10, 11 - Certified Lab Instructor (CLI) at the PSTF

October 16-20 - Vitals Signs Conference

October 28 - EMS Seminar (EKG Interpretation) at Irondequoit Ambulance

November 15 - AHA ACLS at Victor Farmington Ambulance

December 9 - MLREMS Preceptor Course

December 10 - Certified Instructor Update (CIU)

May 5 - MLREMS Preceptor Course