DPM NEWS

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Public Health

On *page 3*, hear another perspective on the credibility and role of public health.

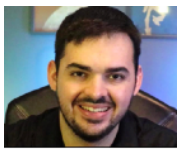
Agitated Patients

Dr. Lemay provides an overview of agitation and how to deal with varying levels of it on *page 8*.

Patient Restraint

I provide some (hopefully) useful thoughts on managing agitated patients at the point of physical restraint being necessary to provide effective care and maintain a safe environment for the patient and providers on *page 11*.

High Fives and Hypotension



Shane O'Donnell, NRP, FP-C, C-NPT

You and your BLS partner are dispatched for the 6D1, shortness of breath and not alert. The 67 year old female is well known to EMS, often requiring BiPAP at the hospital and occasionally spending several days in the ICU intubated for respiratory failure.

After a 5 minute response, you gather your equipment and walk in the door. As you turn the corner directed by the patient's husband you find the female slumped over in her reclining chair. You and your partner immediately lift her to the ground and perform an assessment, followed by the classic "does she have a pulse?"

CPR is immediately started, your applied pads show a narrow bradycardic rhythm between 15-20 bpm. Fire arrives and you begin two person BVM ventilations with an ETCO2 showing in the 60s. Your second ALS unit obtains IO access as you intubate the patient without compression interruption. 1mg of Epinephrine is given. Your next rhythm check reveals a sinus rhythm at 105 with an ETCO2 of 76. Compressions are stopped with further vital signs revealing a BP of 100/45, SPO2 of 92%.

After a brief "nice!", a backboard is immediately brought to the patient's side. With a quick log roll onto the board, the patient is now halfway down the stairs. The BP cycles, now 60/28. You cycle the cuff again, hoping for something better as the patient is secured to the gurney. You pressure bag in a liter of fluid, trying to get a firefighter to bring your ALS bag back from the ambulance.

Sound familiar? Did the patient decide to suddenly decompensate or did we miss clues that this was going to happen again? Did we get distracted with high fives and miss the critical phase of care immediately after ROSC?

Upcoming Events

Melinda Johnston

For more information about any event listed below, please visit the training calendar at MLREMS.org

April

15 - REMAC meeting

15 - Case conference

29 - Preceptor course

May

20 - MLREMS Awards Ceremony/Council meeting

June

17 - REMAC meeting

Hypotension is incredibly common in the ROSC phase. In one study looking at ICU patients post cardiac arrest, 47% became hypotensive with this group having a drastic increase in mortality (Trzeciak et. al., 2009).

If we look at our post ROSC blood pressure, obtained within a couple of minutes of giving Epi, this patient's MAP (mean arterial pressure) is only 63 (usual goal >65). Epinephrine is usually dosed in mcg, with average starting ranges from 2-10 mcg often providing a robust response. This patient was given 1000mcg 2 minutes ago and has a MAP that doesn't even meet our minimum target. We should be incredibly concerned that this blood pressure may see a drastic reduction once the Epi has reached its effective life.

Alright then, how do we prevent this? It comes down to our focus in the immediate ROSC phase. When ROSC is obtained one of our early actions should be making a Norepinephrine infusion. The utilization of checklists and applications can be absolutely valuable, but this should be reflexively made in the same way each time. 4mg of Norepinephrine (standard concentration, at least in 2024) into a 250ml bag. This gets us a concentration of 16 mcg/ml. Using a 60 drop set, this means one drop every other second will start us at a dose of 8 mcg/ml, well within the normal starting range for critically ill post arrest patients. Ensure a label is added to the bag to avoid any confusion and iatrogenic harm from "opening up" the bag.

ROSC can often feel like a rare event and should absolutely be celebrated, but not at the expense of knowing that getting pulses back is half the battle.

Trzeciak S;Jones AE;Kilgannon JH;Milcarek B;Hunter K;Shapiro NI;Hollenberg SM;Dellinger P;Parrillo JE; (n.d.). *Significance of arterial hypotension after resuscitation from cardiac arrest*. Critical care medicine. https://pubmed.ncbi.nlm.nih.gov/19866506/

Reflecting

Jeremy T Cushman, MD, MS, EMT-P

In the last issue of DPM News, Eric Rathfelder authored an article that some felt was inappropriate for inclusion.

I misjudged that Eric's contribution to DPM News would be perceived by some as reflecting the position of the Division of Prehospital Medicine. That was not, and is not, the case. As Chief of the Division, I am ultimately responsible for all that comes out of this office, and it was my responsibility – and my failure – in making that clear.

I value that Eric and I can discuss issues from different perspectives. We have robust dialogue and in some cases find we agree, and in others we agree to disagree. We end the conversation with the same respect and professionalism that we had when we started it. And regardless of whether we agree or disagree, we appreciate that our own field of view is widened by hearing each other's.

We strive to assure DPM News is an important source of evidence-based information and perspective. When the evidence is absent or equivocal, we say so; when it's our opinion or our experience, we say so. I failed to keep to that promise and appreciate that others whose opinion and perspective I also value tremendously took the time to provide a submission in response to Eric's viewpoint.

Growth in Discomfort: Credibility in Public Health

Tyler Lemay, MD, NRP, Constance Vernetti, MD, Maia Dorsett, MD, PhD, Kyle Leonard, EMT-P, FPC, Kevin Guistina, EMT-P

In the January 2024 edition of the DPM Newsletter an article written by Eric Rathfelder titled, "The Public Health Profession is Committing Suicide," presented controversial opinions as action items, mostly on the topic of credibility among public health officials. This article was not labeled as an editorial or opinion piece, and therefore could be misinterpreted as supported by University of Rochester, Division of Prehospital Medicine.

Mr. Rathfelder suggests that the credibility of the entire field of public health has been irreparably damaged by the response to the COVID 19 pandemic. While he raises some excellent points about the importance of evidence based practice, and the importance of grace and patience in the face of unknown circumstances, some of his conclusions are misleading and potentially harmful. We disagree with many of his opinions.

THE SCIENCE

It's been a wild ride following masking guidance the last few years. We were wearing masks in healthcare long before COVID, but the combination of supply chain disruption and a highly infectious novel respiratory virus lead to some whiplash when it comes to what we should be putting on our faces, when and where. There has been another wave of science (and opinion) published on the topic, so what should we be doing now, in 2024?

The changes in policy over the last four years are not the product of some mercurial politicians. Below is a great graphic from the Annals of Internal Medicine[1] that summarizes how our circumstances have changed over the last four years. As the world has changed around us, public health professionals balanced risks and benefits to save lives and buy time.

One additional factor that's not covered in this graphic is the unbelievable crowding in our local and regional hospitals. Things *are* getting better, but a quick walk through the ED at URMC will tell you we are not back to normal.

Do masks work?
"In my opinion, masks work," says Dr. Tyler Lemay, U of R physician and REMAC member. "But science is hard, and we don't have the research to say definitively that wearing a mask on your next 911 call reduces your risk. Many news stories have been written about whether masks work, but the best science we have just says we don't know for sure."

But that doesn't necessarily mean they have no benefit. Dr. Lemay adds, "In fairness, we also don't have randomized controlled trials that show smoking causes lung cancer - but I'm not recommending that you smoke. What we can do is use the best available evidence and apply it to our own situation."

The Jefferson study[2] referenced in the previous DPM article has been widely cited but poorly understood. The best summary of the meta-analysis is the beginning of the second paragraph of conclusions: "There is uncertainty about the effects of face masks." Randomized trials do exist that demonstrate masks work,[3] especially when used in conjunction with other methods. Harm reduction is a spectrum. When EMS crews mask, wipe down the gurney and clean their hands between calls we are using the Swiss cheese model of safety; employ multiple methods so that it's more difficult to get all the cheese holes to line up and cause another infection.

Masking is patient-centered PPE, like gloves, or even seatbelts. Seatbelts protect the patient from the other motorists during transport. Gloves protect patients from other patients. And masks protect the patient from EMTs. This last point is often missed, that I'm wearing a mask to decrease my risk, but I'm also wearing a mask *for you*.

Applying the science to our world
We work in an information poor, time-pressured environment. This means we often find out after the call that our patients were sick or exposed. We work in enclosed spaces, in peoples homes and our ambulances, often crammed full of family and responders. We perform high risk procedures on patients who are near death. Suctioning a patient in respiratory failure or intubating a patient with COVID pneumonia is a much different exposure than walking past someone in a restaurant. Lastly, we are trying to steward our incredibly precious hospital beds and every ED visit and hospitalization we can prevent is worth its weight in gold.

Finally, your patient's COVID risk may be different from your own. Although the case fatality rate is around 1% (lower for healthy, vaccinated young adults) the grandmother with diabetes who is on chemotherapy for her breast cancer is at much higher risk. Again, we may not know these details until we drop the patient off at the hospital.

Are there risks to wearing masks?
We know that wearing masks makes it harder to work, harder to communicate, and reduces our connection with patients. These risks are trivial if the mask is going to save a life but they do add up. The benefit of masking depends on factors we often don't know beforehand, and on how much respiratory viral illness is in our community.

With increased viral illness this winter, Rochester Regional Health has requested Universal Masking in their facilities while providing patient care. UR Hospitals strongly recommend masking in all areas. Both are basing their guidance on NYS DOH guidance issued 1/8/24 which recommends that all healthcare facilities in NYS institute a facility wide masking policy.[4]

"The bottom line," says Dr. Lemay, "is that we will continue to show up to take care of our patients. In the current environment, masking is a simple intervention that might keep you healthy, spare a hospital bed or even save a life. If you see me in the hospital or on the ambulance this winter, you can bet I'll be wearing a mask."

ADVOCACY

Our industry was borne out of public health advocacy. *Accidental Death and Disability: The Neglected Disease of Modern Society* identified trauma as a public health crisis and sought political action. As an industry we demand verifiable science before implementing change, even as science evolves. Indications for tourniquets have changed over time, so we use the best available science and place tourniquets we might not have placed 10 years ago. Rejection of dogma and adaptation to new evidence are central to the scientific method, and a positive aspect of our industry.

There are several points Mr. Rathfelder makes which we can reach consensus on. For example, his assertion that the pandemic brought with it "bizarre, non-sensical rules [. . .] such as requiring you to wear a mask while walking to your restaurant table but then allowing you to sit and eat for a hours without wearing a mask." Indeed, this is an example of one bizarre, nonsensical rule. However, instead of being a ludicrous form of moderation, as Rathfelder argues, this was the compromise politicians made between public health administrators and businesses more worried about the economy than COVID transmission rates. Allowing on-premises restaurant dining was associated with an increase in daily COVID-19 case growth rates 41-100 days after implementation and an increase in daily death rates 61-100 days after implantation.[5] And while physical fitness is protective against severe disease in almost any medical context, closing fitness centers was by no means "absurd", as it had nothing to do with the services offered within their walls and everything to do with avoiding close interpersonal contact. The response from the medical community was to offer innovative ways to remain physically active in isolation, arguably an appropriate response to the problem whereby public health officials coupled the closure guidance with solutions.[6] Examples such as these put forward by Mr. Rathfelder are not, as he states, lacking in evidence-based approaches by the public health community, but compromises made to the public good in deference to politicians.

Rathfelder uses the temporary ban on in-person religious services in several states as another example, even though it was ultimately declared unconstitutional by the Supreme Court.[7] That this somehow can be compared to public health officials encouraging "mass gatherings to protest police" relies on a false equivalency. Indoor religious services and outdoor protests have different COVID transmission risks, and public health professionals recommended protesters remain masked while outside and distance themselves when possible.[8]

The section of Rathfelder's article titled "Media and Public Health" is full of ad hominem attacks, straw man arguments and false equivalencies. The media is not public health, no public health officer said these things, and to blame public health officials when the media distorts the message is anti-science rhetoric. Doctors on talk shows distributing bad science is not public health policy. If your opinion is that public health is losing credibility, take a close look at the type of media you consume.

Racism IS a public health issue

The institution of medicine is not immune to racism. Low points in our history include the Tuskegee experiment[9] and non consensual medical research into stem cells.[10] More recently, there have been demonstrated inequities in pain management and healthcare providers who still believe that Black

patients have thicker skin and experience less pain than white patients.[11,12] There are higher uninsured rates with lower access to healthcare for minorities,[13,14] and limited access to trauma centers in predominantly Black communities.[15] Doctors in emergency departments are less likely to classify Black and Hispanic children as requiring emergency care, admit them to the hospital after an ED visit, or order diagnostic tests in comparison to white children.[16]

Racism is prejudice plus institutional power, not individual bigotry. As Kwame Ture said, "If a white man wants to lynch me, that's his problem. If he's got the power to lynch me, that's my problem. Racism is not a question of attitude; it's a question of power." Without the ability to differentiate prejudice and institutional racism, we end up with newsletter articles such as Mr. Rathfelder's that conclude racism is not a public health crisis. Here are some recent examples of racism in healthcare:

- During the height of the pandemic, a person was two to three and a half times as likely to die of the coronavirus if they were Black or Hispanic.[17,18,19]
- Black citizens have a lifespan three and a half years shorter than their white counterparts.[20]
- Maternal death rates for Black mothers are 2.6 times higher than white mothers.[21] This effect is not protected by social strata. Black women with upper class earnings have the exact same rates of maternal mortality as their lower income counterparts.
- Infant mortality rates for Black babies are more than double that of white babies.[22]

"We in medicine are privy to the absolute worst of humanity," says Dr. Vernetti of the Rochester Regional Health System and member of REMAC. "It is not only our duty, but our privilege as members of this field to use our collective experience and knowledge to speak out and advocate. There is no singular healthcare 'lane.' The human experience is much more complicated, and healthcare – and even more so, emergency medicine – is inexorably woven into every facet. Racism, climate change, gun violence, and police brutality are absolutely a public health crisis – in Rochester and the United States."

CREDIBILITY

It is the duty of public servants to raise not only the level of knowledge but the level of discourse in their community.

"I am an emergency physician," says Dr. Vernetti, "And if you think that inequity in medicine, access to care, and gun violence are not public health emergencies on par with COVID 19, then you have not reviewed the evidenced-based research."

Racism as a public health crisis was introduced in 2018.[23] Climate change was declared a public health crisis in 2006.[24] Police brutality was identified as a public health crisis in 2017,[25,26] and the American Medical Association declared gun violence a public health crisis in 2016.[27] All this happened well before the pandemic struck.

If hearing a physician speak out about gun violence or racism makes a farmer decline his COVID 19 vaccine, then the fault lies with the farmer, not – as Rathfelder assigns it – with the physician. It is not the job of science, public health or medicine to make you comfortable. Be humble? Dr. Anthony Fauci worked for over 5 decades as an infectious disease specialist at the highest levels of academia and is the 44th most cited living researcher. While freedom of speech protects Mr. Rathfelder's right to voice his thoughts,

misinformation kills and we would be negligent in our role as physicians and public servants if his distortions went unanswered.

Mr. Rathfelder may not believe that speaking out on gun violence is "our lane." Maybe this demonstrates his primary bias as a police officer, but when a child is shot in your lane, they get taken to our lane, which makes what happens in your lane very much our problem. The most vulnerable among us depend on our competence, our compassion and our advocacy. Contrary to Rathfelder's thesis, activism only enhances credibility.

When the credibility of his own DPM article is at issue, Mr. Rathfelder references Dr. Vinay Prisad, a physician famous for comparing the U.S. government's response to the pandemic with "Germany in the years 1929-1939, where Hitler was given a chance at governing".[28] There is no virtue in prejudice, no valor in parochialism. We need to stop making excuses for bigotry. Hate is hate, no matter how "deeply held" one's convictions may be.

Credibility – the ability to be trusted, to be believed – is certainly an asset when it comes to promoting public health policies, but credibility does not equal political palatability. Truth is just as often inconvenient as it is freeing. Asking public health scientists and physicians to limit their scope and prioritize comfort over reality does a disservice to their community. We cannot make science small and convenient. Public health is comprehensive, chaotic and challenging. We will continue to advocate for our patients and believe that the human capacity for growth and progress may well be limitless.

Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has. - Margaret Mead

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Agitated Patients

Tyler Lemay, MD, NRP

Let's talk about caring for an agitated patient:

Police have cleared you in for the 54yo male who is violent. On arrival he is yelling, struggling against the officers and spitting. No family is available and you learn that neighbors called after he yelled at them and threatened them from across the street. They say "He's usually so nice!" and no one has ever seen him act like this before.

On initial assessment you are able to make out some unpleasant words indicating a patent airway. He is tachypneic with increased work of breathing. You are able to feel a faint, rapid pulse and his skin is hot, dry and flushed. You can't get much more exam safely and he's only yelling nonsense and spitting so you aren't going to get any more history right now.

Your partner has been telling him to "relax" and "chill out" but he just seems more upset, and law enforcement are getting ready to move him to your stretcher for transport. You consider your next steps:

1. Is there anything you can say that might help?

2. Does this patient need calming medications for safety?

3. What is the safest way to restrain this patient for transport, if he continues to require restraint?

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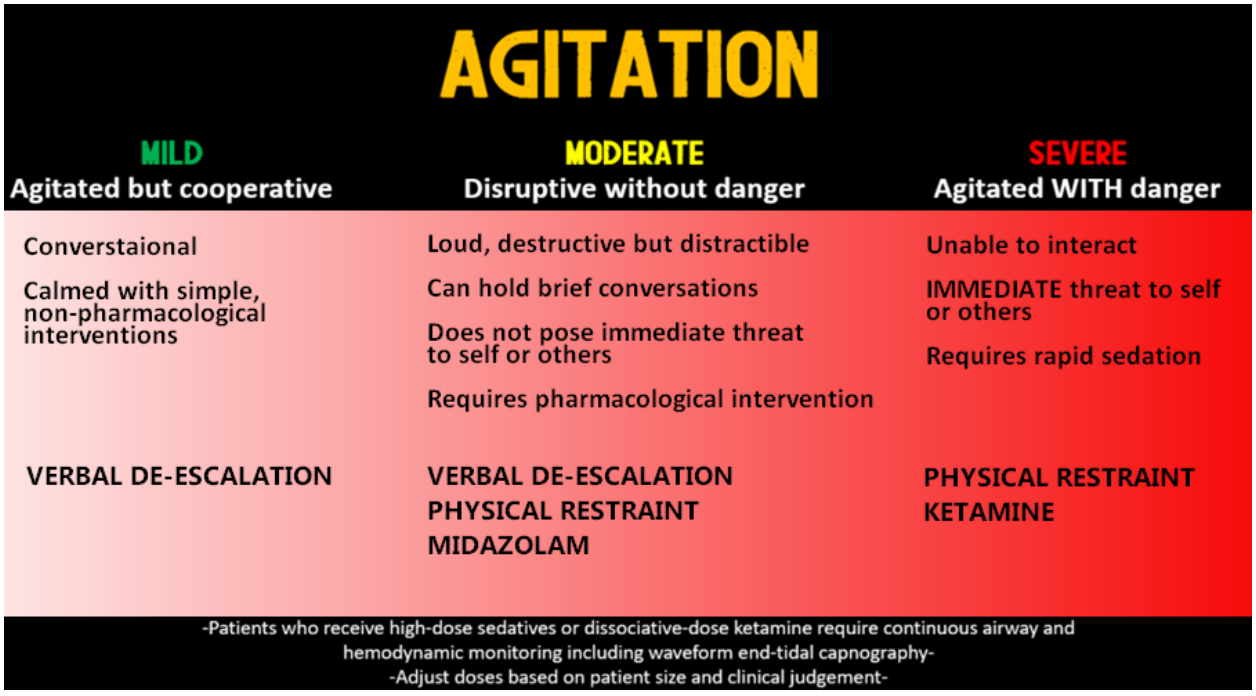
911 calls for people who are intoxicated, in psychiatric crisis or otherwise out of control often lead to challenging patients. You must balance scene safety and patient care, obtain as much history and examination as possible and make important decisions about capacity and legal status. Usually all of this is happening while collaborating with law enforcement, first responders and other EMS providers.

History is inevitably challenging. Patients will occasionally help but usually asking who called 911 and why, speaking with the caller, friends or family or other people who know the patient is the best option to gathering an HPI and PMH. Medication bottles, pharmacy or discharge papers or a medic alert can be a huge resource if you find them. Despite the chaos of the initial scene, this is sometimes the best opportunity to find those important clues and understand what lead to the agitation. Initial examination is often hands off relying on mental status, work of breathing and respiratory rate and skin signs to provide hints of critical illness. Asking permission before touching the patient can build rapport and reduce the risk of violence. If safe, obtaining an SPO2 and blood glucose should be prioritized.

Agitation can be as simple as a loud voice and simply listening can de-escalate the situation, or patients can be irrational, violent and unsafe. Your management should depend on how agitated they are:



(Credit to Andrew Merelman, EMT-P, Reuben Strayer, MD and Kevin Gustina, EMT-P)

Mild agitation is the patient you can talk to. They may be upset about something that happened, may be mildly intoxicated or have some psychiatric disturbance but they are able to have some meaningful conversation with you. Verbal de-escalation can go a long way in these patients, or sometimes we can simply work around their agitation while we perform our evaluation and transport to the ED.

Moderate agitation is the patient who is disruptive. Their behavior may be uncomfortable and uncooperative, and it can be difficult to complete a full assessment. A skilled provider may be able to de-escalate with words only, but you should request ALS if available as many of these patients require calming medications, restraints or both. The threshold for medications in the state protocols is "Potentially violent behavior," and I would add patients who cannot be safely assessed or treated due to their agitation. Midazolam 5mg (0.1mg/kg) IM or IV is appropriate for many of these patients. The upcoming protocol changes will allow haloperidol as an alternative, talk with your agency leadership and medical director about whether this will be an option.

Severe agitation is an immediate threat to your crew, the patient or other members of the community. These patients are out of control even when they are restrained and require ALS intervention as soon as possible. Often no history and very little examination is possible before providing calming medications, and almost all of these patients will require restraints initially. Some of these patients will benefit from Ketamine 250mg (2mg/kg) IM.

After you have created a safe environment you MUST go back and complete your examination. These patients typically tell us very little about what happened to them so we have to look, listen and feel for signs of trauma, evidence of illness or infection, and especially reversible causes of their altered mental status. A complete set of vital signs (including etCO2 for patients who received medications) and blood glucose are mandatory. A 12 lead EKG will evaluate for sodium channel poisons such as antihistamine or TCA overdose or metabolic disease such as hyperkalemia. Monitor closely for respiratory depression and hypotension and provide expert support of the ABCs. Many patients have suffered when EMS or hospital providers assumed they were intoxicated or psychotic when they were actually dangerously injured or ill, this is the time to think through our field impression and other possibilities.

My differential diagnosis for agitated patients focuses on too much of something, not enough of something or something that isn't usually in their system:

Oxygen (too low)
Glucose (too high or too low)
Blood pressure (high or low)
Heart rate (high or low)
HCG (high, pregnancy!)
Thyroid (too much T3/T4, hyperthyroid)
Alcohol, stimulants, hallucinogens (too much)
Withdrawal from sedatives such as alcohol, benzodiazepines (not enough)
Sodium (too low)
Red blood cells (too low, anemia)
Blood, tumors or high pressure in the brain (not usually there)
Bacteria or viruses (meningitis, sepsis, UTI, pneumonia; not usually there)

Treat what you find and be sure to communicate what you found and how you treated the patient at the hospital. EMS often excels with these difficult calls. Ask for additional resources if needed, stay safe and do your best for these challenging patients! More to come during our training next month.

The updated MLREMS policy on care of agitated patients is worth a read, lots of good information on restraints, interface with law enforcement and best practices:
https://www.mlrems.org/GetFile.aspx?fileID=27395

New York State Collaborate protocols:
https://www.health.ny.gov/professionals/ems/pdf/ny_collaborative_protocols_v23.1.pdf

SAEM article for medical students, this is a nice summary for folks who want a little more:
https://www.saem.org/about-saem/academies-interest-groups-affiliates2/cdem/for-students/online-education/m4-curriculum/group-m4-psychiatry/agitation#:~:text=Differential%20Diagnosis,of%20the%20altered%20mental%20status.

Tips for Patient Restraint

Eric Rathfelder, MS, EMT-P

I've recently been working on policies and training related to patient restraint from both the EMS and law enforcement perspectives. Considering the thorough article on agitation by Dr. Lemay above, it seemed timely to share a few quick tips related to patient restraint.

Start flat

A point, made clear by the "patient" during filming of some training videos on patient restraint, is that it is very important to do the initial restraint on a flat stretcher. The reason is there is more slack required in the upper extremity restraints when a person is lying flat (distance from shoulder to wrist is greater) than when the person is in a position with the head of the stretcher upright or partially upright. This is especially important when the patient is restrained with soft restraints since they are typically only effective when pulled taught. When a patient is secured with handcuffs to the sides of the stretcher, there is often enough play and movement in them to allow the head of the stretcher to be moved up and down. However, once a patient in soft restraints is appropriately secured in an upright position with the stretcher belts secured, dropping the head of the stretcher could easily cause damage to the joints, or at the very least significant pain, as the upper limbs are stretched beyond capacity.

Railings

The most secure point of attachment for restraints is the frame of the stretcher. Many stretchers are now equipped with the wing-style railing that is a solid piece of plastic with a single opening for a handhold. With these stretchers, that single handhold will be the only practical point of attachment for handcuffs and securing them to the frame will likely not be an option. For soft

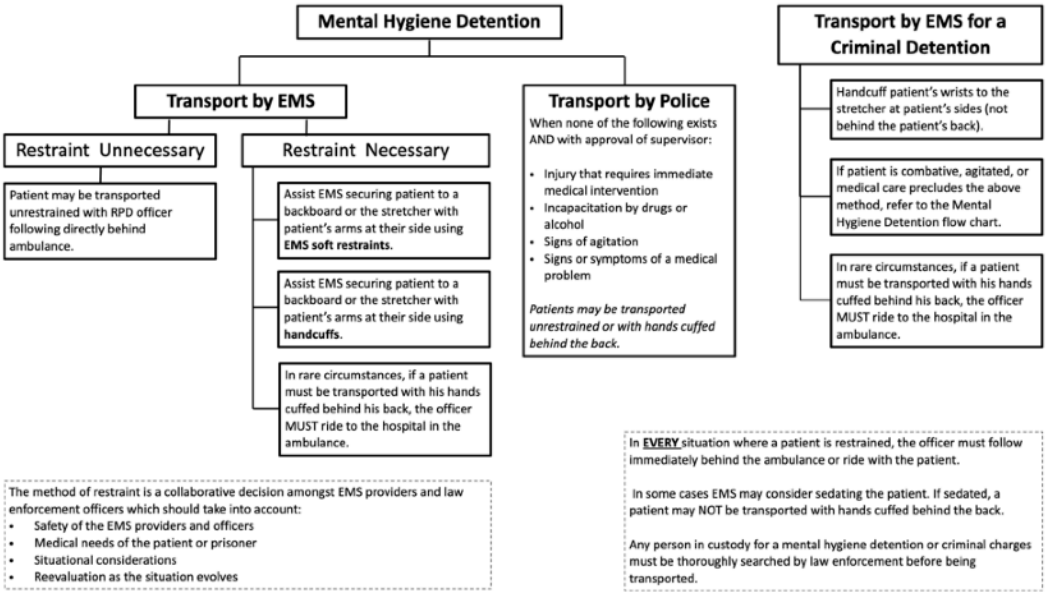
restraints, that handhold makes a very useful pass through for the strap of the restraint before securing the strap to the stretcher rail. This method has several benefits, including using the stretcher wing as a barrier to prevent the patient from access to the knots or strap of the restraint and allowing the tension of the restraint strap to be directed outwards which leaves less "wiggle room" for a squirmy hand.

The most important strap

Perhaps somewhat counterintuitively, in my opinion ***the most important*** strap is the one on the upper legs just above the knees and, when possible, I always try to apply this early on (in this photo, the strap is a bit high on the legs). Applying a snug strap just proximal to the knees removes all the leverage from the patient's lower extremities which allows available resources to focus on the upper body and effectively takes the lower body out of play. It can also be helpful to secure each ankle to the *opposite* side of the stretcher so squirmy feet can only squirm across the mattress but not off the side of the stretcher.

Principles over specifics

Patient restraint scenarios are often dynamic affairs and trying to craft policy that provides very specific steps for every foreseeable scenario can be daunting and ineffective. In a recent overhaul of RPD/AMR restraint practices being rolled out over the next month or so, we have focused on providing a menu of options guided by best practices or principles that all fall within the policies and general orders of the region and the individual agencies. By approaching patient restraint from a principles standpoint, officers and EMTs can use their judgment and experience in order to most effectively accomplish the task at hand - safe and effective transport of the restrained patient. Below is a graphic organizer used by one local police agency as a training tool to summarize portions of their patient restraint policy.



Congratulations to all of the MLREMS Council award nominees for 2023 and thank you to everyone who submitted nominations! The awards ceremony will be at the May Council meeting on **Monday, May 20th beginning 4:00PM** at the Public Safety Training Facility (1190 Scottsville Rd)