S1 00:10 Welcome to the EMS Focus webinar. We are so happy that you're here. My name is Kate Elkins, and I am with the NHTSA Office of Emergency Medical Services and the National 911 Program. Today, I'm super excited about this webinar. It gets to pull together so many aspects of what our office works on, what our communities work on, as well as my background in education. So I'm currently a doctoral student at Hopkins in public health. I love seeing public health in action in EMS. And I'm really excited today with our presentation with the subject matter experts that are coming to the table to really help us talk about EMS harm reduction and substance use disorder treatment. Next slide, please.

S1 00:57 So you're here. You know about our webinars. Please advertise to friends, especially in the EMS community. But we cover a variety of topics. And we do these on a regular basis really in order to get information out to the EMS community that is timely. We're really pulling together subject matter experts in the field, pulling together federal partners, trying to cover all the topics that really we need to get out into our community. But also, we're very receptive if you have topic ideas or questions or areas that we haven't covered that you'd really like to be covered in the future. So please join us for future webinars and always check back and look at the recorded webinars that we've done over the years. Next slide, please.

S1 01:44 So a little advance notice. Our next webinar will be in April. We're really excited to have partnered with the Health Resources Services Administration's EMS for Children's program to talk about their upcoming National Prehospital Pediatric Readiness Assessment Program. This is an incredibly important program, and we're excited to see it launch. So please join us in April to learn more. And then there will be another webinar in early June. If you go to the QR code on your screen, you can see the stored and recorded webinars from the past. Next slide, please.

S1 02:21 So we have upgraded our resources page. The search bar is better than it was. It's easier to find things. So this resource hub is really trying to give you access to a wide variety of documents, reports, guidelines that are created in the NHTSA Office of EMS by our partners, by our federal partners, by stakeholders, by the community, and really thinking about everything from agenda for the future to the clinical guidelines and reports, these resources help advance our profession nationwide. You can access it using the QR code on your screen or going to EMS.gov. And if you are aware of excellent resources that need to be added to this resource hub, please let us know. Next slide, please.

S1 03:10 So the NHTSA's Office of EMS, it is our mission to reduce death and disability, not only on our roadways, but across the country, and really providing leadership and coordination of EMS systems. We need to have interoperable, evidence-based, people-centric systems of systems across our country. And we practice at this fabulous intersection of emergency management, public health, health care, behavioral health, and public safety. And because we have this opportunity of being at the intersection of all these systems and encouraging the interoperability across jurisdictions of these systems, it's really a neat way to bring together the community and have discussions like we're going to have today on this webinar. So we are a convener. We are trying to build resources and tackle the tough issues for our community and really provide awareness and education of best practices, evidence-based guidelines, and what EMS systems and 911 systems do across the country.

S1 04:13 So, our office, we do a lot of education within the federal space as well as across levels of government. We also have this ability, this opportunity to sometimes see things that our peers and our counterparts might not be seeing. For example, today we're talking about substance use disorder and harm reduction in EMS. It's my opinion that EMS systems across the country, through this incredible work, bringing public health to people in need where they are, really can make a huge difference in reducing impaired driving crashes by improving access to substance use disorder treatment, by improving harm reduction in our communities. Imagine if we really had the resources in our communities to do better for the people who are struggling with these substance use disorders and how it might really impact the number of these bad crashes that our EMS clinicians are responding to. And maybe we could actually improve our trauma care by that trauma never actually happening. Isn't that an exciting thought? Next slide, please.

S1 05:24 So a little bit of housekeeping before I get too far ahead of myself and before we get to the really cool content of this webinar. So you can use the Q&A button in the bottom of your screen to submit questions throughout the presentations. And then we will have a question-and-answer portion at the end. Please consider getting your questions in early. I expect that there will be a lot of questions. If we do not get to your question, we will be working on answers to all the questions to be posted on the website later. We will be posting this webinar on the website later as well. If you want to see captions, you can use the Show Captions button to view closed captions at any time during the webinar. Next slide, please.

S1 06:11 For today's webinar, we're going to highlight the integration of harm reduction and substance use disorder treatment, focusing on the role of EMS care in addressing these critical health challenges. We have a fabulous set of panelists who will discuss their recent research findings, share innovative strategies and interventions aimed at preventing overdose in communities. Additionally, we will cover reduction of health risks associated with impaired driving, including the impact on traffic crashes, and how important the importance of innovation and driving positive outcomes for public health and safety are.

S1 06:45 First, we're going to hear from Dr. Gerard Carroll, sorry, an EMS medical director at Cooper University Healthcare, the division head of the EMS and Disaster Medicine, and the program director of the EMS Fellowship Program. His program was the first with BUP program for EMS in the country, and we're really excited to not only hear about his program but a lot of the research that has been done following their launch. Then we will hear from John Ehrhart, paramedic, EMS manager at San Diego Health Connect, the co-founder of the California Paramedic Foundation, and founder of Mission Critical Protocols. And then Simon Taxel will round out our panel. He is a paramedic crew chief and public safety driver with the Pittsburgh Bureau of the EMS. He is a Fellow, Bloomberg American Health Initiative Fellow, at Johns Hopkins, part of my cohort, which started in 2022. And we will conclude that panel with some question-and-answer and discussion with all three. So, next slide. We will hear from Dr. Carroll.

S2 08:04 Hi, everyone. Can you hear me okay?

S1 08:06 Yes.

S2 08:08 Awesome. Good afternoon or good morning if you're somewhere else. Let's jump into it. So it's a little bit about me. I'm a medical director here in Camden, New Jersey, at Cooper University Healthcare, longtime paramedic out in New York City years and years ago, and now a medical director, board certified both in EM, EMS, and also now in addiction medicine. And I'm excited to talk to you a little bit about the spectrum of what EMS might be able to do for this disease. So let's jump into the first slide. And so this has kind of moved over the last five years. What is the spectrum of the EMS response to opiate use disorder? It's a little bit of a loud slide, so I'll just give you a second to read because that's what happens when I make loud slides. And so I want to draw your attention to before and after, right? And so this is the idea of what can we do before in our communities and through community paramedicine, through just our regular 911 rigs, right? It's the idea that can we screen patients? Can we distribute resources? Can we be that bridge between the public health sector, right? Can we give places a safe drug drop? Can we do education and referral right on the scene?

S2 09:18 Sometimes patients walked up to us and we do this even though they're not the patient we were called for. Leave Behind Naloxone is taking the country by storm. We're actually down 20% of our overdoses this year. I'd like to think that's just because patients aren't overdosing anymore, but I think a lot of it is that people are self-treating and that's still a win. And also drug checking. It's handing out Xylazine and fentanyl test strips. And then that moves us down to the overdose recurrence, right? This is kind of our bread and butter in EMS. This is what we do. What do we do after, right? We're all experts. I've been sadly waking up overdoses for over 30 years and only recently had anything else to offer my patients, right? But it's the idea of the opioid overdose receiving center, handoff both to public health or public health in the emergency department. Can we go visit these patients afterward? Can we give them Bupe on scene? And can we give them Bupe in the days following? Can we actually bridge them into clinic? So this is kind of that menu, right? That harm reduction and then treatment that all of this menu, I think, needs to be looked at by the different agencies across the country. But something in here you can do in your local. And I want to challenge you to look at it and reach out to us if we can help. All right. Next slide, please.

S2 10:31 So what I'm here to talk about and what I kind of focused on is about five years ago we kind of were really facing a crisis in Camden. We'd always had a horrible substance use disorder challenge for our patient population, but the wheels came off the bus in 2018 and 2019. Overdose and unconscious became our two top call types and our providers just couldn't handle it. I couldn't handle it. It was compassion fatigue versus burnout. You just can't resuscitate the same person over and over again until finally, you're too late. It's just not a way to practice medicine. So we kind of went back to the drawing board and we're like, "What else can we do? The status quo is not working." And we decided that maybe we could actually induce patients onto buprenorphine right after their overdose. And we kind of trialed it over those years, really kind of started first with physicians. And then through a waiver that New Jersey was generous enough to grant us, we were able to put it into the field. And since then numerous places across the country have joined us. You heard Katie kind of call me Jeane in the beginning. That's because Gene Hern, who couldn't be here today, is kind of my partner in crime out in California. And so below are two references. One of my studies, one of his so you can read about it. You don't have to just believe me. And let's move on to the next slide. We'll talk a little bit about the details.

S2 11:50 So what is buprenorphine? I apologize. I'm sure a lot of you know, but I feel like there's so many misconceptions about this drug. I just want to talk about it, right? So you hear a lot of names, buprenorphine, you hear Suboxone, Subutex. What is all of this, right? So first of all, let's cover Suboxone because I want to get rid of it as soon as possible. So Suboxone is a combination product. It's buprenorphine plus naloxone. And everyone gets confused because naloxone is our opioid antidote. But when you're using Suboxone, unless you inject it, the naloxone is not doing anything. So we can kind of put the naloxone to the side, and we're just going to focus on buprenorphine. So buprenorphine is a fascinating drug. It's the only opiate of its type. It's a high-affinity partial agonist, right? And that means it grabs opiate receptors very high, like a really strong, manly handshake, right? We're kind of you're like ouch afterward to the point where other opiates can't grab that receptor nearly as tightly. However, whatever happens, it then gets limp and it can't really shake your hand. It only holds it halfway. And so I think of it a dimmer switch. It grabs that dimmer switch really hard and nobody else can touch that switch, but it can only turn it on halfway as opposed to if fentanyl grabs that switch and you take more and more fentanyl, it can turn that switch all the way up until you can't breathe.

S2 13:08 And if you look at the graphical thing and not my little picture of a light switch, right, if you look at the full agonist and that's methadone, fentanyl, morphine, heroin, all the drugs that we're used to, they just keep going up almost linearly. People stop breathing right around here. I don't know if you can see my cursor. Meanwhile, on buprenorphine, if you take these meds, you kind of hit this plateau and you keep taking it and very little or no effect occurs, which gives us a great safety profile. It's also incredibly long-acting, almost 24 to 48 hours, which, again, that keeps patients from going up and down and lowers the risk of withdrawal. So that's kind of like pharmacology in 30 seconds, but I figure it's always worth covering. Can I go to the next

slide, please?

S2 13:48 So what do we have to do to bring this to EMS, right? Addiction care in EMS, at least in my EMS career and in what I've been able to find, was pretty limited. And we're making great strides there in the last few years, but we really had a lot of catch-up to do. And I needed paramedics to really recognize developing withdrawal, right? Why were these patients so sick and miserable after we resuscitate them? It's not just that these patients are difficult, right? At least that's what we're hoping you see, right? And then we needed to ask our paramedics to do something really difficult, right? They needed to see the withdrawal, and then they needed to engage with the patient, kind of bring them back in a situation which is very-- I mean, I can't imagine being on the side of the road, half-dressed,/ unconscious, not really know what happened with developing withdrawal, which means I'm going to feel worse and worse every moment. And I wake up to see everybody who knows what's been going on when I don't. So how do you engage with that patient? How do you restore dignity?

S2 14:43 And then we needed to go with an EMS-style dose of buprenorphine. We didn't have time. We didn't have time-- we didn't days to weeks to get you onto the medication. We needed to do it in minutes, right? Especially because you're getting sicker by the minute from the naloxone you already were given. So we did an aggressive induction, 16 to 24 milligrams. And this has been-- we didn't create this. The emergency departments have been trying this for some time with great success, and it's also followed for us. And then the last thing for EMS is we have other calls to do. I'm already asking a lot here. We need an easy way for these patients to get follow-up. Obviously, just giving them buprenorphine once in the field is not enough, but we can't have EMS working as social workers, so we needed a quick thing. So that's kind of how the four pieces of the protocol that we designed. And most places that are being successful have a similar model. Next slide, please.

S2 15:32 So I want to kind of go through. So we created this protocol back in 2019, which I wish Jean were here, but I believe in 2020, he went live with his program. And we have a few differences, and it's worth comparing if you actually decide to-- I hope you do decide to do this, you should look at all of our different success rates and what we've chosen. So for us, New Jersey was very prescriptive. You had to have naloxone opiate withdrawal, which means you had to have naloxone before you were eligible in California, they decided if you were in withdrawal for other reasons, you could also qualify. Methadone is a long-acting full-agonist opiate; I mentioned it briefly before. It's a great treatment for opiate use disorder despite a lot of stigma around it, but mixing buprenorphine with methadone is not a win. So for us, you can't have it for the last 48 hours; it takes a little less than 48 hours to get out of your system. California went a little more conservatively, no methadone for the last ten days, a little bit more of a safety ratio there. Patient has to regain capacity; that's true for both, right? This is not an implied consent kind of treatment. You have to be ready for it, and you have to be convinced, which is why it's a little bit of salesmanship on our medic's part.

S2 16:46 Initially, we excluded pregnancy; buprenorphine is a great treatment for opioid use disorder in pregnancy, but you don't do new things with pregnancy, so that's why it was initially an exclusion. We've removed it recently, and California is thinking to do the same, or they may already have, and I could be a month out of date. We initially also did it only in adults, but we've recently lowered that to age 16, which is the FDA kind of indication on buprenorphine, also being looked at out west. We initially started with a COWS of seven, but then lowered down to five. Out west, they're still using a COWS of seven. The COWS is a clinical opiate withdrawal scale, and five to six or seven is kind of right on the line of mild to moderate withdrawal. All right. Next slide, please.

S2 17:39 So what does it look like? So you've overdosed, your paramedics show up, they resuscitate you because they're masters of this, right? Your patient regains consciousness, and now we do kind of a patient-centered conversation, and if the patient consents, no exclusion criteria identified, then we dose patients with 16 milligrams; that's two films. We've found that the tablets of Subutex take a little bit longer to dissolve, and we had less success with them, though there's not a huge scientific study, but my recommendation is the films when you can get them. And then we did Zofran, right, because vomiting is just not a win anywhere, but especially in the ambulance, and then we give the paramedics the option of redosing about ten minutes later if the patient is only partially or not responding to the first dose. In our system, we find that it was really hard to schedule patients, both for the medics and also for patients to keep those appointments, and so we have afternoon walk-in where these patients are prioritized Monday through Friday, and on the weekends, the emergency department fills that gap. In Contra Costa, California, where this program first was adopted after us, they have a substance use navigator who reaches out and schedules things for them, which is a pretty cool program as well. Next slide.

S2 18:54 So outcomes, right? Don't just believe us. So if you look at our seven days after induction in the field, 38% of our patients show up in-clinic, 29% in California. 30 days in treatment - that's patients who showed up for that first visit - 22% of our Butte patients remain while 26 in California. And our average COWS reduction is 7.1 and 6.9, respectively, all, basically, showing that the intervention is working very similarly on both coasts. Now, certainly, we'd like higher numbers than this, but these numbers compete very well with a lot of emergency department bridge programs, and if you think about it that 1 in 10 of this incredibly sick population is dead in 12 months, I think we can extrapolate fairly safely that these are lives saved if we keep these people in treatment. Next slide.

S2 19:42 Like anything else you do, you need to track how you affect the system. There's still cardiac arrest, strokes, and heart attacks that need to be answered, so we needed to look at what we were doing to the system by initiating a program like this. In Camden, that extended scene times by about seven minutes, however, a lot of these patients don't go to the hospital in our system, 48% in Camden, which meant that we actually saved time, even though that wasn't the initial goal. In California, they have a very high transport rate still, so there's a lot of access to resources in the ED, which is great. Both of us had a precipitated withdrawal situation of about 1%. Ours is even now a little bit lower as our numbers have gone up. Both of those patients for us were patients who we didn't realize were on methadone, which is why I really have to focus on that methadone exclusion. Next slide.

S2 20:30 And so that kind of brings it around to the end of things. I think in 2024 in your EMS system, there is something you can do for the opiate crisis. And if you don't think you have an opiate use disorder, I got to challenge you. Somewhere in your local, you have it. I'm hoping you don't have the one we have here in Camden, but you have it, right? It could be the extreme of needle exchange up in the left corner to the simple leave-behind Narcan, which I feel like all of us should be doing. Test strips, especially as our drug supply gets more and more varied, mobile integrated healthcare over on the right, buprenorphine in the center. There's just a ton of options here for this space. And I think you should reach out, look into it. The fact that you're on this call means you're thinking about it. And I'd love to answer any questions. Thank you so much for your time.

S1 21:21 So there are a lot of great resources that Dr. Carroll spoke about, and you can access them through these two QR codes. Next slide. John, on to you.

S3 21:38 Hello. Hi, everybody. Thanks for having me today. My name is John Ehrhart. I am the EMS. Well, I'm a paramedic from San Diego, California, first and foremost. I still fly, so I fly on a helicopter. So I'm not directly as a medic interfacing often with opioid use disorder, although we have had on occasion that bubble up to us as well. In addition to that, I work as EMS manager for San Diego Health Connect. That is the Regional Health Information Exchange. In my role there, I try to connect the dots with technology, get information flowing between EMS, hospitals, and all parts of the healthcare spectrum. I also work at the California Paramedic Foundation, where we have a huge emphasis on EMS-led injury and illness prevention. We actually put out a national award that we try to highlight programs that are doing really excellent work in that space. It's called the Nicholas Rosecrans Award. And Dr. Carroll is a prior winner of that for his work that he just presented to you all. And I also work at the organization mission-critical protocols focused on technology around EMS protocols. Next slide.

S3 22:42 I think I have two intro slides here. So if you would like my email to contact me about anything I'm discussing, that's on here as well. Next slide.

S3 22:53 So my portion of this, I do work with Jean and Jerry on the programs that are implemented in California. But my focus is really around how EMS can launch programs such as opiate use disorder initiatives in a sustainable way, how they make sense, how can we get organizations that may not have as pressing of an issue as Camden, New Jersey, to see a way that is viable for them to do similar work? And so the things I wanted to discuss were, at least initially, what is our vision for the future? I think Kate highlighted some of the awesome opportunities that are available. The way that I look at integrating programs into existing EMS operations and how we work with sub-grantees to discuss what level of integration they'll do with public health initiatives. And then kind of this idea of organizing a potential opportunity to organize ourselves into including these programs long-term in a sustainable and dynamic way. And lastly, I just wanted to highlight some technology requests that I have of you all to work with your vendors because I think that technology vendors are a huge partner in this, and I think that they want to help their customers succeed. And so if we ask certain things of them, they may be able to support us better in these initiatives. Next slide.

S3 24:15 First and foremost, I wanted to highlight the agenda 2050. This is a follow-on document to the agenda for the future that came out in the '90s. I love this document because it's very powerful. It was built through a huge process two years in the making, national with brilliant minds in EMS. And I love the document because it's ammo for change, right? And in my local community, if I want to make a change, I could point to this document and say, "This is not just this is not just our organization. This is a national movement. We should look at this. We should challenge ourselves to do better." One of the major themes of the document is a people-centered system. I like this a lot because if you think about EMS, for 50 years, we've told people to call 911 and they call 911, and they call for everything, right? And as paramedics, I know I'm guilty of this too, but we think about it, and we say, "Well, this is not a 911 call. Why did you call?"

S3 25:10 And in any other business in the world, nobody would be concerned with an abundance of requests coming in. They would try to figure out how they could better serve those requests because it's a market, right? It's a need. There's value in society. So I really like that approach for us to think about it from our perspective change, to say, "Hey, maybe we can make some changes here to better serve this community. Maybe that brings value. Maybe that could be the future of EMS." I also like-- this bottom black box here is from kind of a precursor document they put out before they started the process, the values that they were kind of engaging the process with. And I love the first two bullet points, particularly the first one. It just says, "Avoid wallowing in the problems of today." It's almost like the people that led this had been in a few EMS meetings. Next slide.

S3 26:02 So the way that I think about EMS systems and the way I approach potential people that are looking to implement public health programs is to think about kind of the unit economics of what EMS does. So if we look at the traditional 911 system, we have this responsive system, right? It's built over 50 years, super complicated and how it performs at a really high level, right? A lot of excellent work and a lot of resources has gone into that. And then we've seen this new rise of mobile integrated health or community paramedicine where EMS is stepping outside of the responsive model to do additional work. I really like thinking about it like this because if you think about prevention programs and how they would be integrated in EMS, at the first level, you could think about how can we use the system that we've already built, right? If we are going to layer in additional programming initiatives, can we put it into our system that's already going to patients that may have a need? And then I think that a common theme with that, especially when people are starting programs, is to think, "Well, I have a fixed budget, right? I reimbursed X dollars for each transport. And so you're asking me to do more with the same budget." And I challenge people to think about that differently.

S3 27:14 EMS has built a responsive system, right? And it's EMS's budget for what we do and are responding to STEMI, strokes, trauma, all the things we go to. But the infrastructure could also be used by other organizations' budgets, right? And so that's something I have a few more slides in here to talk about. But opening it up and saying, "Hey, if we had partners, how do the

unit economics here change? Because we're going to the calls anyway, is there additional value for other stakeholders and other projects that EMS has not traditionally been involved in?" And then with NIH, it's a little bit different in economics, right, because the paramedics are stepping outside of the normal structure that EMS was built around, right? This transport or respond and transport model. Dr. Carroll has this fantastic quote that he said a presentation in California where I think it was something to the effect of across the United States littered with corpses of MIH programs that weren't calibrated or something to that effect. And so I think that it's interesting when organizations look at programs like opioid use disorder and they think, "Oh, I may need to step outside of the normal response realm," well, yes, maybe, right? If there's partnerships and things that make sense, if there's gaps in the community where that makes sense, but it doesn't have to be that way from the start, right? "Is that the most sustainable way to do it?" "It depends." Next slide.

S3 28:38 So I know Dr. Carroll hit on some of the different ways that the protocols work in and around with opioid disorder. I've kind of bucketed it into these two categories, integrated in 911, so in that first product that EMS delivers and then going and stepping beyond that. In 911 calls, so again, these are things that EMS providers can do that are very non-disruptive to the system. Dr. Carroll highlighted that it doesn't increase scene times. It doesn't destroy the efficiency of the system. It just produces value. So if we look at things like data sharing, yes, we share data with our state registries or state repositories, and that goes up to NEMSIS. But are we sharing data with local stakeholders that are trying to make a change in opioid use disorder or any other public health initiative? Naloxone distribution, distributing out resources to the community on calls.

S3 29:29 Buprenorphine is a huge one. So I think that's the one where folks wonder if it's going to cause efficiency problems in and around normal operations. And I argue that it does not. When we implement these programs, it's another protocol for paramedics to learn. We're used to that. We're used to changes in our policies. We're used to enhancements to the way that we do work. And buprenorphine is just a nice addition to that. In fact, it's kind of the opposite as paramedics enjoy having a correct tool for the challenges put in front of them. And then one of the big things we're looking at at San Diego Health Connect is automated or at least streamlined electronic referral for resources. And then if you step beyond that, if you decide that there's a huge gap in your community and you want to step beyond that and do these types of really high-level programs where maybe you're working outside on calls, you're doing follow-on buprenorphine, Suboxone, dosing, follow-on check-ins to make sure that they're going to their appointments, getting involved in task forces, doing community outreach, social media, all those kinds of things.

S3 30:29 Those are very viable programs. They can be supported with external funding to EMS to do those, but there needs to be a demonstrated need for that in the community. And we've seen some stellar stories and programs of this working really well. I'm thinking of one of our ROSE Award winners where the community paramedic team is actually brought to the ED to do buprenorphine administrations because the hospital in their region could not administer it for some bureaucratic reason. So next slide.

S3 31:03 So thinking about those unit economics, I think this is probably one of the most exciting things for EMS to consider in partnership with Public Health or any other stakeholders that may have an interface with the patients we serve in our community. We're already responding on these calls. And if we layer in these programs effectively in a non-disruptive way, it really increases the value of the EMS system, right? It increases the reimbursement structure for the things that we want to do, and it tunes us into that more people-centered type system. So I would challenge everybody to think about at a minimum, especially with opioid use disorder, how could you implement a policy in a way that you can do this? And I would also challenge you to look at your community and see if there are partners that may want to have their program get involved with your EMS delivery system. And you may see huge opportunities there. Next slide.

S3 32:01 And then if you step into the MIH world or CP world, this is incredibly important, so I'll use an example. We had an MIH program that was really focused on improving the efficiency of their EMS system, right? They had huge offload delays, so they were trying to divert patients away from the EDs, and that program is running, right? It was effectively launched; it was serving its purpose, but there are periods of time where they're not being used, and they had an opportunity to integrate opioid use disorder among other programs, so they reached outside of EMS. It was outside of their normal budget to run the program, and they said, "Hey, we have providers that are in the community. We know when these events are occurring. Would you like us to help your program run?" And they said, "Yes. Absolutely. We'll fund you to do that," right, "We will give you dollars when you have bandwidth to go help us handle our projects, our programs, our initiatives that we're trying to do." And the reward here is incredible. It's better for the patients; they're getting more resources to them, which is the ultimate goal of all of these things that we do, but it also makes that program more viable, more multimodal, and it helps it run long term and be more sustainable for the other things that it does that benefits us internally. Next slide.

S3 33:20 So these next couple of slides are just my dreams for EMS underneath the Agenda 2050 vision for the future. I think in the future, EMS can dynamically and constantly consider how it interfaces with external stakeholders. What are the pressing issues in their local community? Who is working on those issues? And how can EMS get involved with them, right? Because then EMS isn't working in its own internal silo, its own budget, its own thing, and then also maybe saying, "How can I do more inside of my realm?" It's actually looking broader across the community and saying, "Who else's budget, who else's interests are aligned with mine that we can deliver higher patient resources?" Next slide.

S3 34:10 So this is kind of just a flow of imagining how you could do this, so you can use your tools, and this could be your EPCR; this could be epidemiology platforms that you have access to to analyze your data or quality assurance platforms you have access to; this could be with a health information exchange partner such as San Diego Health Connect. But identifying opportunities in your data for issues that you're interfaced with that are pressing issues in your community and that other stakeholders are working on, you can design programs around that in coordination with those partners to say, "Hey, how can we synergistically work together to affect change, to have positive improvement here?" And you can essentially create a

dynamic portfolio of programs, right, and this could be issues that are totally unrelated to each other. It could be you have a program running for opioid use disorder, you have an interface with senior successful aging, you have those types of things, but I also think you could consider opioid use disorder has many facets to it, and each of those could be programs.

S3 35:10 You could be aligned with a community organization sharing data to help their program run. You could be aligned with a naloxone distribution program that's entirely a separate partner. You could be aligned with substitute navigation doing buprenorphine. So considering that it's not just one big program, those could be several programs combined together for the same topic and then monitoring that and making changes on that dynamically, right? Constantly evaluating what the public health need is in your community and aligning your programs around that to make yourself, your EMS operation, a very good fit, really calibrated for what's going on in your local region. Next slide.

S3 35:53 The last one I have, this is kind of a request to all of our EMS partners across the country, but I really think that technology is here to help us make these changes. We generate a lot of data in EMS and that data can drive a lot of really cool action in our own programming in partnership with other stakeholders. This book on the left is Automate the Boring Stuff with Python. It's just a book I love. And the major theme of it is basically how can you get rid of the boring parts or the things that you get bogged down in so that you can focus on the exciting changes that you want to make or the exciting work you want to do. I think that as EMS providers, we have a huge opportunity to steer our data systems into this place where we can partner with people outside of our silo. We spend a lot of time introspecting on our own system and how we deliver care. But we can ask of these vendors to give us tools and solutions so that we can interface rapidly, dynamically, constantly with partners and work on their programs in addition to ours in non-disruptive ways. A lot of that can be automated. A lot of that can be automatic. And then I also think that there's some really exciting tools on the horizon.

S3 37:03 I spoke about this at EMS World and I'll be speaking about it again at another conference this summer but the ability for large language models to work through EMS data is incredibly exciting. There are queries we can ask of things like do we give people-- sorry, do we give naloxone? Is this an overdose primary impression, those things? But when we want to get into some really interesting public health spaces like does this patient have difficulty managing their medications? Or is this a person-- is this a senior that could potentially benefit from a public health program that helps them coordinate their care? Those are questions that AI can answer and that's very exciting. So I think that all of this together is a huge opportunity for us to rethink how we connect with other stakeholders and how we deliver programs. Next slide. I think that's it for me. Thank you.

S1 37:54 Awesome. And on to Simon.

S4 38:04 Thank you. I wanted to take a second and thank Katie and the team at NHTSA and everyone else who helped put this webinar together. I appreciate the invitation and the opportunity to talk to everyone. I've been in EMS for 20 years now, paramedic with the city of Pittsburgh for the last 15, and I am hopefully finishing up my work at Hopkins this year. I'm going to take some time and talk about some of my personal experience working in this space and the programs that we've been working on at Pittsburgh EMS. Big picture, though, I think the take-home message is that we are in a day and age when overdose is a primary cause of death in the United States. And the unfortunate reality is every single one of those deaths is preventable. Not one single one of those deaths is an inevitability. And so we have an opportunity in pre-hospital care to do something about it. And I think that our traditional role of responding to 911 calls and then providing care and transport falls short of meeting that need. And so as we go into the programs that we're working on, I'll talk about that. Next slide, please.

S4 39:32 So the first thing I want to mention is how we've really worked on optimizing our strategy for overdose management. And this is, in its core, a harm reduction measure. Naloxone, in the context of trained healthcare providers with access to equipment like bag valve masks, BLS airway management tools, and oxygen, naloxone is not a life-saving intervention. I am not speaking about community naloxone or lay rescuers. I'm talking about healthcare providers. So we encounter patients who are in respiratory arrest. They're extremely hypoxic and hypercarbic. And we are working very, very hard to encourage our team to initiate positive pressure ventilation, BLS airway management, and complete monitoring, including pulse ox, EKG, and end-tidal CO2. And then, if possible, establish IV access and then give 0.4 milligrams of IV naloxone. And what we found with this strategy is that patients are very, very likely to regain spontaneous respirations, most regain consciousness with a single dose of 0.4 milligrams of naloxone. And when we have effectively oxygenated them and reduced the hypercapnia prior to giving naloxone, then the incidence of side effects like nausea and vomiting or agitation, and even precipitated withdrawal are much less, also because we're giving the lower doses of naloxone.

S4 41:18 And just to respond to a question that came up in the chat-- just to make sure that everyone hears it. There are lots of high-dose naloxone products that are coming to market right now. There is zero evidence to support their use. The one study that they came out with, they gave high doses of naloxone to beagles and said that the beagles responded better to the high-dose naloxone. But it's really junk science. And there is no human trials to support their use. And there isn't even any real anecdotal evidence to support their use. There's just a ton of misinformation out there. So we were really trying to get to a holistic strategy for overdose management, and we can really help patients. We have to get beyond the culture in EMS of saying that give enough naloxone so the person can walk to the truck.

S4 42:19 Especially today, here in Pennsylvania, we have a lot of xylazine in our drug supply. And so we're seeing a lot of patients that even when they have return of spontaneous respirations, they don't really regain consciousness. And so that affects that treatment strategy as well. And so what we're telling people is that-- our clinicians is that after they've ventilated and oxygenated the patient, they're no longer hypoxic or hypercarbic. They get that IV. They're monitoring everything. They give a single dose of naloxone, wait five minutes, and then give a second dose of naloxone. And if the person is still obtunded or unconscious or experiencing any other symptoms, then just prepare for transport. We don't see any real value in giving

additional doses of naloxone after that.

S4 43:14 Moving on, we built our pre-hospital buprenorphine program based on the work that Dr. [Gerard?] and his colleagues did in Camden. We use essentially the same protocol. We give it to both patients who have had an overdose reversed with naloxone, as well as people who are experiencing withdrawal symptoms and have been opioid abstinent. My claim to fame, I was the second Pennsylvanian-- the second paramedic ever in Pennsylvania to do a buprenorphine induction in the field. That first one was a textbook example of this strategy working perfectly. A woman who was due to go to an inpatient treatment program. She was on her way there but felt so sick from withdrawal symptoms that she pulled her car over on the side of the road and called 911. We responded, and we had our conversation. She was open to the idea of medication for opioid use disorder, buprenorphine. We contacted the facility that she was planning on attending, and they were willing and able to support ongoing treatment with buprenorphine.

S4 44:37 And so, we did a BUP induction in the back of the ambulance, and within minutes, she felt much better. I think we ended up giving her 24 milligrams total of BUP plus 4 milligrams of Zofran. Her symptoms resolved, and she continued on to the treatment center that she was planning on going to. We couldn't have asked for a better outcome with that. Unfortunately, I don't have wraparound data to know what her long-term outcome was.

S4 45:09 I've had a number of cases where people have been adamant that they've been opioid abstinent for up to seven days and then experienced precipitated withdrawal after buprenorphine induction in the back of the ambulance, and that's challenging. I think that reflects the high level of fentanyl in the illicit drug supply in our region. We're seeing more and more patients who are people who inject drugs regularly, who know what they're using as fentanyl primarily, and are very, very resistant to using buprenorphine, especially in the standard dosing strategy that we use in the field because of the incidents of precipitated withdrawal. And so, I think we're challenged to come up with a better way to handle induction in the context of fentanyl and synthetic opioid-dominated drug supply.

S4 46:14 In 2017, Pittsburgh EMS was the first EMS agency in Pennsylvania to start doing leave-behind naloxone. Now, we do a packet that has naloxone fentanyl test strips as well as a bunch of print material about local recovery services. This is a great example of what we can do that may begin as somewhat controversial. When we first initiated that program, there was a lot of resistance among our colleagues that we were encouraging drug use or doing other things that would keep people using drugs rather than getting them into a safer place. And here we are almost seven years later, and that's just become ubiquitous and non-controversial.

S4 47:08 Incremental change is frustratingly slow, and there's so many people that die while we're taking one small step at a time. And, we always have to shoot for the stars. But I think the reality is that there comes a moment when we have to accept that it just takes time to change culture, change practice, and do what we can. I think this is a great example of a program and a project that was, at one point, controversial among paramedics but is now widely utilized and accepted. Next slide, please.

S4 47:45 We also offer a warm handoff to an outpatient addiction medicine treatment center. We have a 1-800 number that we can call 24 hours a day, 365 days a year that'll take us directly to a scheduler who will get our patients with-- to outpatient treatment within 24 to 48 hours of the phone call. And so that's a great option. We hope to one day be able to divert people directly to treatment rather than emergency rooms when that's not required. But obviously, issues with billing and liability and center availability-- that's still a pie-in-the-sky program. We are now doing screening, brief intervention, and referral to treatment. We have the option-- for any patient that calls 911 and has non-urgent medical needs, we can screen them for high-risk drug use using the DAST-10 screening tool, and then refer them-- give them resources based on their score.

S4 48:59 If people are not familiar with the DAST-10, it's a 10-question yes/no survey that will stratify a patient's risk of drug use from low-risk, moderate risk, to high risk. And so if a patient is screened and they have low-risk drug use, then we would simply offer them out-- what I would call our harm reduction packet with naloxone, fentanyl test strips, and recovery service information. If they fall in that moderate risk range, then we would offer them the packet as well as the warm handoff to addiction medicine treatment. And then, in the highest-risk strata of the screening, we would do everything for the packet, the warm handoff. And then, especially if they weren't going to the hospital, we have some availability with peer support specialists and social workers to respond as a co-response fashion with community paramedics. And so we'll try and bring them directly to the scene to engage with the patient.

S4 50:07 We just started that program in January. I built and developed that program as part of my work at Johns Hopkins. And my capstone project for my master's degree is going to be an evaluation of what we've done and how it's going that will hopefully be complete by the end of this year. And then finally, we did notice-- or our public health partners noticed a significant increase in Hep A in our region a few years ago. And so we tried to and did initiate a Hep A vaccination pilot program. And our initial strategy was offering Hep A vaccination to patients that we were engaging with post-overdose. We found very, very quickly that trying to talk to patients about preventative healthcare measures immediately post-overdose is not a great time.

S4 51:03 People are uncomfortable oftentimes, especially when they're getting many, many doses of naloxone from lay rescuers. They're experiencing precipitated withdrawal. And there's shame, there's stigma. And so it's not a great moment to talk about, "Hey, do you want a vaccination for this disease you may or may not have heard of?" And so that didn't work so well, but we were able to go out in teams to a local syringe service program that runs a mobile needle exchange in Pittsburgh. And we set up shop next to the needle exchange van and just started talking to people and offering Hep A vaccinations to the community members that were already engaging with the SSP. And then, uptake of that vaccination program was incredibly high

S4 52:03 and so I think that shows that for us in EMS, the things that we need to be thinking about is being proactive instead of

reactive, not waiting for overdoses to occur, and considering non-traditional ways to engage with community members beyond just 911 response. And as I wrap up, the last thing I want to say is that every single one of these overdoses is preventable. None of these have to occur. And I think it is our duty to find new ways to engage with the community and new solutions to these problems that are so deep-seated and are causing so much death and disability across the country. So I'll turn it back over to Katie and her team, and I want to thank everybody for their time and attention throughout the presentation.

S1 53:02 Simon, thank you so much. Let's go to the next slide. So we don't have a lot of time for questions and answers. So what I want to encourage everybody to do is fill up that Q&A in the Zoom. We have been typing answers during the presentation, so many of the questions have been answered. If your questions already been answered, awesome. If we do not get to your question, then we will be posting those with the webinar and the slides on ems.gov. So I feel like there has been a really rich conversation in the question and answers. And so I don't want to-- we're just about out of time. I don't want to delve into doing any of them live, but I want to encourage you to continue this conversation. All of our presenters are very approachable. They are in our community. They are doing presentations at conferences. They're doing work academically. They're publishing papers really to help us advance EMS in this really important space. So please do not hesitate to engage with them. Don't hesitate to engage with our office.

S1 54:10 This is a really important area. I think it is incredibly important for us to better understand how all of these innovative programs can better be researched and implemented in more communities. So I really hats off to Dr. Carroll and all of those who have been publishing their work so that others can replicate it and so that we can continue to evolve our systems. For anybody who wants to know how they're going to be able to get a hold of the panelists, their email addresses, I believe, are on their slides. We will make sure that when we post this information on ems.gov. Now, mind you, I move at the speed of the federal government, and so it takes me a couple of weeks to get this up onto our website. If you need to talk to them sooner rather than later, send me an email, and I will happily make an introduction.

S1 55:05 But we really appreciate you taking the time out of your busy schedules today to join us. And we really hope that you have enjoyed this EMS-focused webinar. I'm sorry we didn't have a lot of time for live questions, but I hope that most of you all that got them answered in the chat. Dr. Carroll was going through a lot of questions in the chat. We will answer all of those questions and post them online. Thank you for being here. Next slide, please. Please let us know if you have any feedback about the webinars. And I apologize that we didn't have more time for questions. The content was so important. We will leave that question and answer open for another three minutes for you to add in your last-minute questions, and then we will post them with the webinar online on ems.gov. Simon, John, Dr. Carroll, thank you so much for taking your time out of your busy schedules, out of your innovative work, and really sharing with our community the work that you're doing. You are so passionate, and it's such an important area of work for EMS.

[silence]

S1 58:44 Thank you all for posting your questions. Thank you for being here. We will get all of those answers as soon as we can up onto the website. Thank you so much for your dedicated work in EMS.