Just Increasing Access to Drug-Checking Services

Introduction [00:00:01] RTI International's Justice Practice area presents Just Science. Welcome to Just Science, a podcast for justice professionals and anyone interested in learning more about public health, innovative technology, current research and actionable strategies to improve the criminal justice system. In episode four of our community based solutions for Substance Use Challenges season, Just Science sits down with Doctor Nabarun Dasgupta, pharmacoepidemiologist and senior scientist at the University of North Carolina Injury Prevention Research Center, and Erin Tracy, research chemist in the University of North Carolina Injury Prevention Research Center, to discuss their unique approach to providing drug checking services on a broad scale. To address and prevent overdose deaths it is crucial that local public health and harm reduction groups can check what substances are being used in a community so that they can make informed decisions about local services, policy and education. The UNC Street Drug Analysis Lab has made these important drug checking services more widely accessible by developing mail in drug checking kits, which allow organizations to collect their own samples, to submit for lab analysis and provide anonymized results back. Listen along as Doctor Dasgupta and Erin discuss types of drug checking technology, navigating the legal and logistical challenges of mailing street drug samples, and the positive impact of their drug checking program. This Just Science season is supported in part by RTI Award number 15NIJ-21-GK-02192-MUMU, awarded by the National Institute of Justice and by award number 15PBJA-23-GK-02250-COAP awarded by the Bureau of Justice Assistance. Both are agencies within the Office of Justice Programs, U.S. Department of Justice. Here's your host, doctor Lawrence Mullen.

Lawrence Mullen [00:01:45] Hello, and welcome to Just Science. I'm your host, Doctor Lawrence Mullen, with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. One funding source provided by NIJ is the Research and Evaluation on Drugs and Crime Solicitation. We are here today to talk with Doctor Nabarun Dasgupta and Erin Tracy about their drug checking program in North Carolina. Thank you for joining us, Erin and Nabarun.

Nabarun Dasgupta [00:02:06] Great to be here. Thanks for having us.

Erin Tracy [00:02:07] Great to be here.

Lawrence Mullen [00:02:08] So can you all tell us about your background and what led you to your current research in the UNC Street Drug Analysis Lab?

Nabarun Dasgupta [00:02:15] My background is that I am a pharmacoepidemiologist, so that's ten syllables that go from molecules to populations. And we started thinking, you know, as the drug supply was changing from prescription opioids to heroin to illicitly manufactured fentanyl and its analogs, we realized that there was going to be a gap in our knowledge, epidemiologically, about the exposure side of the equation. So when we think about drugs, people are taking and then outcomes like overdose or infections in epidemiology, we really want to know kind of what is causing those downstream harms. And as the opioid supply has changed over the last decade, we knew that there would be kind of a gap if we didn't have real time information on what is actually in the drug supply.

Lawrence Mullen [00:03:01] So, Erin, can you tell us about your background?

Erin Tracy [00:03:04] I am a chemist by training, so I have a bachelor's degree in biochemistry and a master's degree in forensic science. And I worked for a decade as a drug analyst and crime laboratories in Georgia and North Carolina. And after doing that work for about a decade, I was looking to pivot into something more impactful within the community. And that's when I was able to get connected with Nab and the Opioid Data Lab.

Lawrence Mullen [00:03:30] Fascinating journeys. Let's get into the meat of this conversation here. So I'll direct this first question to Nab what is your drug checking and why is it important?

Nabarun Dasgupta [00:03:39] So right now we only find out about what's in the drug supply when it's too late, when people are either dead or they're arrested or denied for a job or fired from a medical practice. And so we really wanted to figure out how we can get information back to people in a more rapid way so that they can make better decisions about what to put in their bodies. There's a lot of precedent for doing things like drug checking. So the basic concept is testing street drugs to figure out what's actually in them, how much is in them, and provide that information back to individuals. In the United States, this legacy goes back to the Woodstock era, so late 1960s and early 70s, when these machines and methods were used at music festivals to help people understand the difference between LSD and mescaline or mushrooms or whatever else was being used. You know, fast forwarding into the 1990s and early 2000s, there were multiple programs that were set up in Europe and Australia that provided more real time information back to individuals and in Canada as well. And those were run by harm reduction programs, public health programs, as well as like in the Netherlands. It's been through, like their law enforcement services, where people can bring in drug samples anonymously and then have them tested, get the results, and then make decisions about what they want to use or not use. In Europe, a lot of that kind of grew up around the MDMA and nightlife and ecstasy party scenes, and the same in Canada as well initially, but as the overdose problems with opioids have increased, and the types of opioids found in the drug supply have gotten more diverse. There was a clear, logical reason to kind of expand from a nightlife setting to a more street drug setting. And with that shift, there was also like a shift of demographics where at festivals, as often people who are not dependent on the drugs, they tend to be younger, more white, more affluent. But the problem is, if you look at who's dying from overdoses, it's a lot of people of color. The rates are highest among Native Americans and African Americans, and the street opioid supply is a lot more complex in some ways than the kind of nightlife party drug scene. And so the whole intervention has kind of adapted to that space. Some of the things that have been documented in the scientific literature when drug checking has been enabled in festivals, is people will either throw away the drugs if it doesn't contain what they expected to contain, or they may use less or use more safely. And that's kind of the basic concept of trying to get this information back to individuals so they can make better decisions about what they put in their bodies.

Lawrence Mullen [00:06:17] So this really gives, you know, a feel of harm reduction. What methods are used in this harm reduction program to test the composition of the street drugs?

Nabarun Dasgupta [00:06:25] Sure. So, you know, at a very basic level, human beings have been testing what's in drugs with their own bodies forever, for millennia. Right. In the modern incarnation, with the forensic science and chemistry tools, there's a stepwise level of sophistication. So there's test strips which are like a dollar, a strip. And those are amino

assays that were originally intended for urine drug testing, but can also be used for solid drug samples, with some caveats. From test strips we go to reagent testing. So this is used a lot in the festival scene and say Mexico and Colombia, where you can drop different chemical reagents onto a drug sample, see what colors they change, and use that to infer what's actually in that sample. From there we can go to machine based methods, which are FTIR, which is Fourier transform infrared spectroscopy. And that is like a point of care thing where instruments are about the size of a toaster oven, and you can get results back in about ten minutes. And they're fairly reliable. And then the final level of sophistication is lab based services, where you use GCMS, LCMS or QTOF to do a more detailed analysis of what's in that sample. So harm reduction programs use all of these different methods and different combinations. And our lab kind of sits at the far end of that spectrum. We also support the FTIR based programs that are happening at point of care and harm reduction settings.

Lawrence Mullen [00:07:52] As far as FTIR goes, like in contrast or in composition with the point of care drug checking. How do those efforts fit in with the lab based work at UNC?

Nabarun Dasgupta [00:08:01] So we were asked by a local science service program in Greensboro, North Carolina, Survivors Union, to help them get started using FTIR because they had been gifted a machine. And we quickly realized that they would need a lab to support that work, because there's some things that don't work as well on FTIR, like it's hard to distinguish between benzodiazepines or if it's plant material or if it's a fake pill, for example. Those things are harder to resolve on FTIR than with a GCMS or LCMS based lab. So we call that complementary testing, or some places it's called confirmatory testing. We prefer complementary because some of these instruments are better at certain things. And we try to take a multi instrument approach. But once the North Carolina Survivors Union got their FTIR, we got it up and running, they asked if we at Unk could be their partner lab to help them do quality assurance and kind of with these more difficult samples. And so that was a request that we got in late 2020. And during the pandemic, I was in a Covid PCR drive thru setting, and they handed me in a plastic bag, a kit that had like a vial with a liquid in it and some nasal swabs. And I was like, well, if we can stick this swab up our noses and put it into a vial and get results back the next day, why can't we do that with dope. And that was our kind of starting point for trying to figure out how to do this.

Lawrence Mullen [00:09:27] Erin, can you tell us about how your mail in drug checking program works?

Erin Tracy [00:09:32] Sure. So if there's an interested group such as a syringe service program, a drug user union, or a public health department, they can go to our website, which is Streetsafe.supply, and they can fill out a request for kits. And as Nab said, they are very similar to a drive thru Covid test. And the main component of our kits is really a vial of solvent. We use acetonitrile, and so we'll mail out these kits to groups and they do their own sample collection. So that gives them the freedom to submit as much of the drug sample as they can or are willing to submit. We accept residue amounts of samples, partial pills, powders, plant material, anything you can think of, really, as long as that can fit within about a four mil vial of acetonitrile. Then these kits are shipped back to the lab at UNC, where we will do the unpacking and the analysis. And right now we are working with about 130 programs across 34 states. And this week we have just surpassed over 6100 samples.

Lawrence Mullen [00:10:42] Oh, wow. Do you know, like, how many samples you tested? Like in total or?

Erin Tracy [00:10:46] That's the total. That's 6100 individual drug samples that have been submitted. And these samples, they can be a wide variety. A lot of times our programs that we work with will have their own unique research questions that they're trying to answer. So they'll submit multiple samples from a single particular bag stamp. They'll submit multiple pills with a particular imprint. So we're really seeing this kind of like on the ground public research that gives people the freedom to really dig into their own street drug supply, and we can help them kind of come to their own conclusions about what research questions they may have also.

Lawrence Mullen [00:11:27] So how would you say your background as a law enforcement forensic chemist applies to your work in the harm reduction setting?

Erin Tracy [00:11:34] So, like I said previously, I was a seized drug analyst for ten years, and I was really looking for a shift during the pandemic when I connected with Nab. And I think we can agree, kind of being a forensic scientist is a specific skill set that you're like, where do I go from here with this very specific skill set? And I was really pleasantly surprised to then be able to use this existing skill set that I had to transfer to a public health application. So we are using the exact same technologies and methodologies within the criminal justice system, except we're using it in a public health positive impact within our community. So I'm able to take that knowledge and use it differently. And that was already being done before I even got here. So FTIR is already being used in crime labs and that was already being utilized in the field. Same with reagent testing that's been around for decades in both a drug checking setting and in a criminal justice setting as well. So it was natural to then continue that essentially like liberation of technology to include lab based technologies like GCMS and LCMS.

Lawrence Mullen [00:12:46] So what substances are you currently checking for?

Erin Tracy [00:12:49] So we're using a broad screening method on our GCMS. So it's not a targeted screen. So if it can be seen using a reference library we will see it. Like I said, I've kind of taken the techniques I've learned over my career and what chemical extractions are needed for various substances and use that in this setting. And so we are screening for any drugs you would typically see in a regular analytical laboratory. And then we also are comparing our unknown samples. So unidentified compounds that may not have an identification. There's a network of laboratories that are doing drug checking where we can collaborate to identify these unknown compounds. And then based on our turnaround times, hopefully inform the community faster than necessarily they might get an identification if they had to go through a traditional government lab.

Lawrence Mullen [00:13:46] And as far as the technology, I heard you mentioned GCMS, LCMS and QToF. Like, are there any others that you may use that are a little different from the FTIR?

Erin Tracy [00:13:55] So our main two technologies at UNC are the FTIR and the GCMS. We really value the chromatographic separation that we get with the GCMS instrumentation. Given the current state of street drugs these drugs can have upwards. It's not uncommon to see a mixture of 8 or 10 compounds. And really with that GC portion, we can tease out those individual components of the mixture that can be much more difficult on an FTIR or with a reagent test. And so having a dedicated GCMS for this type of

analysis really lets us dig in to the meat of the samples so that we can separate and identify those compounds.

Lawrence Mullen [00:14:41] Fantastic. Thank you for sharing that. Nab we'll move to a couple of questions as far as funding and things of that nature. So what are some of the challenges you all have faced during this project?

Nabarun Dasgupta [00:14:51] So there's definitely been some challenges. The thing that I really want this audience to understand and hear is that if you are a university lab or a forensic lab, you can do this too. There is a huge need in the harm reduction space, public health space for other labs to step in to. Supporting local harm reduction groups to do drug checking. So I don't want to harp on the challenges, but we have solved a lot of the kind of legal and logistical things, and you all are welcome to take all our methods, all our secret sauces, and cook with them however you want to. The first level of challenges was like the legal question of like, how do we get street samples of solid drugs on to our campus in Chapel Hill and into the lab? And so we have a DEA license to handle controlled substances, and we use that primarily to by the reference standards. What kind of contrivance was that when do you dissolve a residue amount of a sample in this acetonitrile, or it could be methanol or any other kind of standard organic solvents, considered rendered unusable by DEA standards in that form. And we all know this in forensic chemistry, because this is how we get some of the reference standards mailed to us from the reference standard manufacturers and dissolved in these liquids. So we took that paradigm and we moved forward with it. And then in most states controlled substance acts there is exemptions for public health testing of drug samples. And so, you know, it may seem like, oh, you know, this is just possession of a controlled substance. That's kind of the initial reaction. But when you do a detailed legal analysis, you see that there is plenty of precedent for labs testing drug samples. So that was kind of you know, the second piece from legality on the substance side is then like, how do you mail it? So there's an exemption in postal regulations for small amounts of hazardous substances to be mailed. The kits and the packaging that we use have been tested and audited by a third party to ensure that they're not going to get crushed in shipment. And if it does, if there's a leak, what's the absorbent pads inside the box? It sounds all complicated. I mean, we have to, like, throw boxes off a third story bridge and put, like, weights on them to make sure they wouldn't get crushed if they're being stored in a warehouse and all sorts of fun things like that. So again, like all those details, we've kind of worked out and we're in compliance with those laws. So then like the other set of challenges was funding. And we are very fortunate to be funded by the North Carolina General Assembly, as well as a bunch of private philanthropic foundations. And the money from the General Assembly comes from opioid settlement funds. And so I think for our listeners who are interested in doing this line of work, this is what those opioid settlement dollars are meant for, right? This is exactly what they're meant for. So you can make a very compelling case that this is essential public health work and should be funded through the opioid settlements.

Lawrence Mullen [00:17:41] Can you tell us a bit about some of the outcomes from this project? So I think a good way about it would maybe be Erin providing us with lab outcomes, and then Nab maybe you could provide us with on the ground outcomes. Erin, would you like to go first?

Erin Tracy [00:17:54] Sure. I think some of the most rewarding lab outcomes that we have seen have been sharing this technology and methodology with other labs that are looking to get a similar program off the ground in their community. So, like Nab said, there's going to be a GCMS on essentially every university campus, and we are not looking to be the

National drug checking lab. We're looking to help others also do this on the community level. And so it has been really rewarding to connect with other laboratories and share our methods and help each other grow. And then another component of that, being able to identify potentially harmful compounds that are in the street supply that are our users are unaware of, and giving them the knowledge of really what is in the street supply. So when someone says, well, I have a pressed Xanax tablet, well, to be able to say, well, that's actually a counterfeit product. That's bromazolam And here are the precautions you should take XYZ if you would like to continue to use this product. So really empowering people and then being able to share the technology to be able to demystify what goes on in a laboratory, what goes on in an academia White Tower lab to show that it's not scary or unknowable or out of reach. To really translate that to an everyday audience, I think has been really impactful for the lab.

Lawrence Mullen [00:19:25] Thank you for that response. Nab could you explain the on the ground outcomes?

Nabarun Dasgupta [00:19:29] The coolest part of this for me as like kind of a technology nerd, is seeing how people have taken the basic kit, the basic idea, and adapted it to their own needs. This is not a research project. This is a public service of a public university, and we want people to use the service to answer the questions that matter to them on the ground in the moment, and they don't have to tell us all the details about all of that. So we do hear some stories back. There was one drug user union in Nevada, had a street rumor going around that you could detect xylazine and fentanyl or netizens using black lights by shining them on solid drugs, and we saw pictures that they sent us. Of those samples. Fluorescing if that's the right word, under the black lights. And they were different colors. And so they didn't tell us which samples were turning which colors under the blacklight. And then we tested the masked or blinded as we would used to say, and gave them back the results. But they didn't have to tell us, like how that applied to the samples they collected. So to this day, we technically don't know if black lights can detect nitazines, but that was a sufficient use of the technology in the moment in central Nevada. And the reason why we didn't push to find out those results is that the drug supply is not generalizable. It's very localized. It's very like temporally specific. And so what was happening in Nevada at that moment in time has like no bearing of safety on to anybody in our lab. And so we're not trying to create generalizable knowledge as much as helping people. There's also other stories that we hear. We do quite a bit of work now with EMS. And so there's a great EMS team in rural eastern North Carolina and Edgecombe County in Tarboro, they work with their local FQHC, which is a clinic, a primary care clinic for folks of lower financial means. And they buprenorphine and addiction treatment options. The EMS goes and does house calls every week to help people with their xylazine wounds and change dressings, and as part of that, they are able to collect drug samples and know what the different stamp bags are, and they provide that information back to those individuals and some of the stories that they've been able to tell. You know, people would like jump up out of the interview and kind of that encounter setting and say, oh my God, my buddy just bought that stamp bag. It has xylazine in it. I need to tell him right now to not use it. There's very few interventions that I've seen in 20 years of public health drug work where people are telling each other, you know, don't use that bag of dope. So I think there is an untapped power in here. This beyond like traditional data and surveillance. And the other kind of outcomes that happen for us is because we're at this large university and we have a lot of colleagues in pharmacology and chem informatics and pharmacy. When we detect samples that we have never seen before or have no human data on, we're able to kick it over to our pharmacology colleagues, and they're able to do rapid screenings to tell us, like what receptors this bind to, you know, what are some binding affinities, what are

some potential toxicity and potency profiles, as well as doing some animal studies. So in doing that, this direct connection, we were able to isolate something like, you know, xylazine, which is thought to be an alpha two adrenergic agonist. That's a contaminant in the drug supply. It's also a kappa opioid agonist. And that kappa opioid activity is actually stronger than the alpha two activity. And this was something that in 70 years of medical use of this substance had never been detected. But it was a direct connection from seeing another drug supply, working with our pharmacology colleagues and then being able to make new scientific discoveries.

Lawrence Mullen [00:23:02] Wow. So it's like universally impactful. How are you all disseminating the data from this project to important stakeholders and community members?

Nabarun Dasgupta [00:23:11] Sure. The most important thing that we do is provide a card with a QR code, in each of the kits, so that the sample donor can look up the results themselves. No login required. You just enter the sample ID, kind of like you would expect modern technology to work. And so that's really important. I think data is like kind of the third piece of the three things that we do well. One is first being community engagement and customer service. So really working with community, meeting their needs. Erin answers a lot of questions from the harm reduction programs about the nuances of detection limits. And you know, what this peak means and that. And then the throughput and quality from our lab is really high. And Erin's the one she's being humble here, but she's the one who's done these 6000 samples, you know, with her own hands. So that's really impressive. And we're designed to be high throughput. So then the data portion is the third piece of what I think we do really well. My background is also in informatics. And so we have a data pipeline where we have dashboards and other kind of aggregate data. We make all our data public daily. So our lag from, you know, collecting a sample to getting it published in a research ready structured data set is measured in days. So we can answer questions very quickly. We use a lot of NLP to once a substance has been detected, and we know what the public health profile of that substances, we put that text into the results and kind of use a lot of different technologies to do that. Dashboards during the Covid pandemic, you know, kind of blew up and we all looked at them, but we also stopped looking at them after a while. Right. Dashboards are engaging for a short period of time, but then they become too complex. Or we kind of get blind to what the patterns are that are in them. And having built a lot of dashboards over the years that people stopped using, I was frustrated. So what we do instead is make live reports. So these are kind of focused on one question at a time. And it contains the live data maps and charts and numbers and all that. But it also contains, like PDFs of handouts that you can provide in your point of care service, clinical or harm reduction, as well as like videos explaining kind of the broader context. So we have one of these dashboards, for example, for xylazine that you know will get updated daily with the data from North Carolina, but then have all these other resources. So the public data set is there. But instead of trying to visualize all the things all at once, what we think is a more engaging way to do things is to focus on one question at a time and build something that's not just data, but also has these other resources.

Lawrence Mullen [00:25:44] How does this program contribute to overall goals for drug monitoring and overdose prevention in the community?

Erin Tracy [00:25:51] So the lab, like Nab said, publishes all of our data to a public facing website. And then in addition to that, we are also building a drug dictionary based on substances that we've identified with the laboratory. And this will be a public resource

where our stakeholders where drug users, where anyone really can dive into the substances that we're seeing and see, not only on a national scale, but really look at those regional identifications that are really important and that are really nuanced. And then this ties back to what emerging drugs are coming out in the community sample and how these impact our local drug users. And so when we're talking about drugs like medetomidine and other emerging substances where we really don't know much about them or at least much about them, in a drug user population, we can really use a multidisciplinary approach to help our most vulnerable populations. And so I think the program is really able to tap in to real time identification of these emerging drugs. And with the networks that we're building across the country with other drug checking labs, really making sure that we're all on the same page, and to compare unknowns that we may be seeing in North Carolina, but can be the same unknowns that we're seeing, perhaps in Pennsylvania and West Coast. So it's kind of the intersection of really regional, nuanced drug trends with a larger national picture that this program is able to accomplish that.

Lawrence Mullen [00:27:36] Awesome. And you mentioned a medetomidine emerging drug. Do you guys see a lot of emerging drugs and what's the goalpost there on like kind of monitoring them and that kind of thing?

Erin Tracy [00:27:46] I think a lot is kind of a subjective term. And again, it kind of comes down to regional trends when it came specifically to medetomidine, that was in a compound that was already in the NIST mass spectral library. So it was an unknown in the sense that it was a new identification, but it wasn't an unknown. And that was a compound we had never heard of before. So once we were able to order a reference standard and make that identification using the NIST library, then we were able to gather more information and share that with our partners. So so we have seen it. But again, those trends continue to be really regional. And what one part of the country is seeing, another part isn't necessarily seeing. And it's really about using those networks and letting other people know that we're not working in isolation. So especially when it comes to our programs that are using FTIR analysis as well, having an open line of communication, what they are seeing as well, because when you're doing an FTIR analysis, you know, you're looking at a combined spectra of all of the compounds that are in that drug in one spectra combined. And so we have some really tech savvy FTIR technicians that are teasing apart these spectra without chromatography, mind you. And so they're really interested to know what are these unidentified compounds that may not be in an FTIR library. So they're seeing these additional peaks in their mass spec and their FTIR spectra. And they're coming back to me and they're saying like, okay, I'm seeing XYZ, but there's also this other compound that's unidentified. And then I'm able to provide some context, be like, well, I actually am seeing this one additional peak that could be a contributing factor. So really keeping that open dialog with our community partners. And I think coming from a forensic science background where you really look at a drug analysis case in totality, it's not a specific technology used in isolation. So I think the best data that we get on community drug supply is when we use all of these technologies together to form our overall opinion, and then bringing in that epidemiological piece to say, like, and this is what it's doing in the body. So I think our program is really unique and really successful in that multi-disciplinairy approach.

Lawrence Mullen [00:30:09] This has been fascinating. So as far as this wrap up, what would you say is next for your project?

Nabarun Dasgupta [00:30:14] So we are going to be expanding. We're in the process of hiring a second full time chemist, and we have new funding from CDC, from state health

departments to expand this as a paradigm. So we'll keep doing this. Like Erin said, there's so many like localized patterns that are hard to explain. Like why is there so much diphenhydramine and fentanyl supply in Michigan? And why is there so much brocaine in the drug supply in New York, or 1-3-diacetine in North Carolina, there's like these very specific regional kind of variation. We're very interested to kind of understand why those are in the drug supply and kind of where we go, kind of like zooming out to the big picture of what's next. We've identified nearly 300 unique substances in the drug supply, which, by the way, like our Canadian colleagues kind of laugh at us because they're like, we've been doing this for a decade and a half, and we've detected like 900 or 1000 unique substances. You all are just babies. So trying to make sense of of what's there. But looking at all that variability, it's hard to like, see that every day and not wonder what it would take to reduce the variability in the drug supply. What does safe supply look like? What does a world where there isn't fentanyl and fake pills look like? And those are kind of the bigger questions that we are going to be the ones to solve. But I'll tell you, like after looking at these data every day for years, you kind of just think there's got to be a better way than what our current policies are able to do.

Lawrence Mullen [00:31:40] Are there any final thoughts you'd like to share with our listeners?

Erin Tracy [00:31:43] I think from my point of view, the most meaningful aspect of this work has come from our community partners and the relationships that we're building, not only with other laboratories, but with our on the ground partners. And so I think really sharing the flow of information really makes for a stronger community and network, and that it really is going to be this multi-disciplinary approach that is going to continue to move the needle on drug checking and at least attempt to sort of put a dent in the opioid crisis. And I think to the listeners or to anyone interested in, in drug checking, like it's not, process that you do alone, and it's a process that you do in community and that I would encourage, you know, any and all drug trackers to find both local and national resources to really work together.

Lawrence Mullen [00:32:37] I'd like to thank our guest today for sitting down with Just Science to discuss your drug tracking program in North Carolina. Thank you again, doctor, Dasgupta to and Erin.

Erin Tracy [00:32:45] Thanks for having us.

Nabarun Dasgupta [00:32:46] Honored to be here. Thank you.

Lawrence Mullen [00:32:47] If you've enjoyed today's conversation, be sure to like and follow us science on your podcast platform of choice. For more information on today's topic and resources in the forensic field, visit forensicCOE.org. I'm Doctor Lawrence Mullen, and this has been another episode of Just Science.

Speaker 3 [00:33:04] Next week, Just Science sits down with doctor Nicole Swirderski and Jass Pelant to discuss their program to support individuals with a substance use disorder who are reentering the community after incarceration. Opinions are points of views expressed in this podcast, represent a consensus of the authors, and do not necessarily represent the official position or policies of its funding.