

## Just Literature on Stress & Resiliency in Forensic Science.mp3

**Introduction** [00:00:05] Now this is recording, RTI International Center for Forensic Science presents Just Science.

**Voiceover** [00:00:20] Welcome to Just Science, a podcast for justice professionals and anyone interested in learning more about forensic science, innovative technology, current research, and actionable strategies to improve the criminal justice system. In episode four of our Workforce Resiliency mini season, Just Science sat down with Donia Slack, the Director of the Research, Technology and Evaluation Program in RTI's Center for Forensic Sciences, to discuss the literature gaps within resiliency and vicarious trauma research. Discussions on how post-traumatic stress, compassion fatigue, vicarious trauma, and burnout can affect first responders and justice practitioners have increased over the years, but research gaps remain on the level of stress forensic scientists experience. Listen along as Donia Slack discusses the literature on stress, her upcoming doctoral research, and strategies to bolster workforce resiliency for forensic scientists in this episode of Just Science. This season is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Here's your host, Dr. Heidi Eldridge.

**Heidi Eldridge** [00:01:22] Hello and welcome to Just Science. I'm your host, Dr. Heidi Eldridge with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. Today, we're going to mix it up a little bit from our usual format that we've used this season. Today, I will be your primary host, rather than Donia Slack who is usually the host, because Donia is our guest. Welcome, Donia.

**Donia Slack** [00:01:44] Hi, Heidi. Thank you.

**Heidi Eldridge** [00:01:46] So we're going to wrap up the season today by discussing some themes that have come up throughout the season that Donia and I have noticed while hosting the previous podcasts. We're going to talk about some gaps that we see that still need filling, and to do that we're going to spend time talking about a few topics that are near and dear to Donia's heart. She is currently working on a Ph.D. that we're going to ask her all about, and she's also recently published a paper in FSI Synergy - that was in 2020. The paper was titled Trauma and Coping Mechanisms Exhibited by Forensic Science Practitioners: A Literature Review. So we're going to use that a little bit as a framework to drive our discussion while we talk about some of these themes. So, Donia, before we get started, could you just tell us a little bit about your personal journey with this topic? How did you get involved in all of this work you're doing?

**Donia Slack** [00:02:33] It started somewhere around 2017 when I was working at RTI International on the Forensic Technology Center of Excellence, and the topic came up from the NIJ because they were beginning to put together their needs assessment around that year - 2017, 2018 or so. And this topic came up from one of their working groups, and it was published as a needs requirement that year, and we decided that the FTCoE would start bringing some awareness to this topic. Around the same time, I had also decided to begin pursuing a Ph.D. in Criminal Justice at Nova Southeastern University, and this was a topic that I thought to myself, I could definitely expand on this and I have an interest in it because it seemed to be a topic that touched every discipline and had the potential to impact how forensic scientists perform their jobs.

**Heidi Eldridge** [00:03:29] Yeah, I know we've been discussing this topic together for a couple of years, and we've been really talking a lot about how the forensic science field is

exposed to all of these horrible things, and there hasn't really been research into forensic science in particular. There's been research for first responders, police, EMS, that sort of thing. And I know that you and I have bantered back and forth for a while sort of saying like, who exactly is impacted by this? If we're talking forensic science, what does that mean? How wide do we cast the net? We've talked about what happens after the analysis is done and you go to attorneys who are impacted and judges and jurors and the families of all those people involved and how it might impact, you know, the children of forensic scientists when their parents are cranky because they're stressed, and other tangential things that could come up, such as substance abuse as a coping mechanism or, you know, just long-term depression. So we've- all of these ideas have been milling around in our heads for a few years, and we've been saying to each other, isn't it a pity that nobody's looked into this? But then we weren't really sure, I think, to what extent people had looked into this. And so I think that's what's great about the article that Donia recently published is that she took the time to do the lit review and actually go and find out who has looked into this and what parts have been looked into so that we could really know, even for ourselves, where are the gaps? What is it that has to be done still? What is it that maybe we could borrow from other disciplines that's already been done? So what is your takeaway from doing your lit review, like what's been done and is still wide open?

**Donia Slack** [00:05:07] When I first set out to perform this literature review, I made the assumption that there would be lots of information on this. Certainly, there had to have been research done on the level of stress that forensic scientists would have experienced. And so I went down the path of like, what do we even really mean by stress? What are we really looking at? And so what I've learned is that there were studies before in the 80s, but certainly after September 11th, studies were done on first responder community on their level of trauma as it pertained to the terrorist event. So when those studies first began, it was mainly with police officers, and then ancillary to that, and actually, if the listeners want to go back to some of our previous content, in 2019, we hosted a webinar with Dr. Elizabeth Brondolo, and she is a research psychologist who is married to a police officer that was involved in the September 11th attacks in New York City. And he was the one that actually came home and brought this problem to her where he told her we understand that there has been PTSD experienced by our police officers and we are attempting to adequately account for that and provide services for that. He was like, however, we know that there are an entire group of individuals - with medical examiners and coroners and the death investigators - who don't fit into the traditional services that would have been provided to the police officers. And so he told her, we've got a problem. I think you need to study this. And so she put forth some really, really fantastic research - research that has actually really impacted the field, especially with that particular discipline and has done several studies since. From that time, when you look at the literature, that's kind of where Pandora's box started to open about well what is the real problem and what are forensic scientists in general experiencing? And is it just limited to forensic scientists or the disciplines that are actually face-to-face with families of victims? Is it face-to-face with the actual horrible, traumatic death scenes? And then, to a certain extent, most of the literature looks at those first responder type groups - the crime scene investigators and the medicolegal death investigators. And when I say the majority of literature, I still only mean a handful of studies. So it's not like there's a ton of studies out there.

**Heidi Eldridge** [00:07:32] Majority of three, right?

**Donia Slack** [00:07:34] Yes, pretty much. It's still not that many. And so what I noticed was one of the reasons why there still seems to be a gap in truly understanding the problem is that there is an issue with understanding the lexicon of trauma. And I'm not a

psychologist, so I will do the best I can with explaining what the literature explains. But there's really different levels of trauma when it comes to these types of events. There's the traditional post-traumatic stress disorder, PTSD, that many people hear about - a lot of military personnel, you know, it's a common affliction that is widely known in the community. And then similar to that, there's something called secondary traumatic stress or STS. Now STS almost presents identically to PTSD, and in some literature, they actually argue that there's not even a difference. But secondary traumatic stress is similar in that individuals will experience intrusive thoughts. They will exhibit avoidance, withdrawal, tension. They'll have a disruption to their sleep. And it really does kind of present itself very similarly as if that person had experienced the trauma themselves. But the difference being is that secondary traumatic stress is really they have direct and close contact with survivor of trauma. So it's not directly on them, it's secondary to them. This was initially studied with first responders, medical personnel, and then members of the legal and correctional community. So a lot of those individuals that do have these punctuated relationships with individuals. Also, secondary traumatic stress can happen in forensic professionals when it is just one event. So September 11th is a really good example or a mass shooting where you have to process a scene that could take a couple of weeks to do it properly. But you're experiencing something where you see a lot of casualties and a lot of the traumatic content. With secondary traumatic stress, another verbiage that's really used with STS is compassion fatigue. And so that is basically the same issue, from what I understand of the literature, it was coined by Figley, and it was just used because secondary traumatic stress sounded a little bit too stigmatizing. So instead, he kind of merged the terms. Now I believe that there's been some research to kind of separate the two of those, but really they are hand-in-hand and related. The other term that makes its way through the literature for this topic is the term vicarious trauma. So vicarious trauma was coined in the mid 80s by McCann and Pearlman, and they were studying mental health professionals that were exposed to traumatic patient information. So they had ongoing relationships with their patients and they were being exposed to a lot of horrific stories. As you can imagine, stories of especially childhood abuse and other types of trauma. So vicarious trauma is a little bit different in that it actually is an affliction that alters your worldview of people, society, and your own personal safety. It's a shift in a cognitive schema of how you view the world. So it is a little bit more long-lasting. It's actually said to be permanent. It's pervasive and it's actually cumulative. So when you have multiple exposures to an event, it actually is causing this cumulative effect where it really does change the way that you view the world from that point forward.

**Heidi Eldridge** [00:10:55] So would you more expect to see vicarious trauma, for instance, in practitioners who are sort of mid or late career where they'd had time for that sort of cumulative weight to settle on them?

**Donia Slack** [00:11:06] Yeah, I'm really glad you asked that, because that's where some of the gaps in the literature lie. Over several years, I would say from somewhere around 2015 or 2016 on, this is where a lot of the studies - and again, when I say a lot, I only mean, you know, maybe two handfuls - of studies are now going down the path of trying to determine, well, we understand that forensic scientists might exhibit some form of stress - whether it's secondary stress versus vicarious trauma, you know, it's really hard to kind of tease those apart. So several studies have looked at one or the other, but none have looked at both to determine if it is one or the other and if it is different, maybe for field-based versus analytical or laboratory-based disciplines. And this is one of the reasons why we were really excited to have Dr. Raunick on the podcast is because she decided to look at vicarious trauma as it pertained to the sexual assault nurse examiners, and it was really eye-opening to see what types of stress the SANE nurses were experiencing versus the

traditional women's health nurses. And there was - there were differences, right? And so the same could be postulated on the rest of the discipline. We know that not every forensic discipline is directly in the field, on the scene, and actually having to process the scene as a whole. However, what we also do know is that even at the bench level, examiners are exposed to sometimes hundreds of different cases in just a week or a month because they have to get through backlogs. And a lot of times, the traumatic material that they're exposed to include traumatic case notes that may or may not come with pictures. You know, in order to do the job properly, you do have to have a level of information from the case. So knowing, you know, the age of the victim and knowing the sequence of events with violent episodes and homicide, and instead of just processing one case, they might have to process several in a day and have to switch gears and read different case notes that are pretty traumatic.

**Heidi Eldridge** [00:13:17] Right, and in some cases, the evidence itself can be traumatic. Digital evidence where people are seeing, again, child abuse and that kind of thing. Even things like threatening notes. If you're having to process the note for fingerprints or for handwriting, well, you're reading the content of that note, and if there's something there that's very upsetting, well then the analyst who's working the evidence is seeing that too, or the biologists who are looking at different blood samples to get DNA out of them. You know, they're looking at these torn up underwear or torn up women's garments with blood all over them and semen all over them. And there's still a narrative running through their head as to how that got there, which has to be upsetting.

**Donia Slack** [00:13:57] Correct, especially when it comes to seeing evidence. I know there was a great paper by Seigfried-Spellar in 2017, where the researchers were looking at digital forensic evidence technicians versus digital evidence technicians who also served as the investigator. So they had this dual role where they were doing both the analysis and also the interaction with the victims or the families of the victims. And they noted that they actually scored extremely high for direct PTSD from having the dual role - that the ones that performed just the bench work and just did the analysis were still absolutely stressed, still exhibited secondary stress, but the ones that had to perform that dual role were even more so.

**Heidi Eldridge** [00:14:43] That brought them to a new level by having that additional interaction?

**Donia Slack** [00:14:46] Yes. And also, when it comes to the literature, the studies have mainly been done on the field-based forensic scientists. So there's a lot of research - Rosansky and Cook is a good one from 2019 where they were looking at direct PTSD in crime scene investigators. They actually were looking at direct PTSD as opposed to some of the other instruments that could have looked at vicarious trauma versus secondary trauma. What they found was that only 9.3 percent exhibited PTSD. But what I thought was really interesting from that study was that they noted from a qualitative question that they were asking that the CSIs felt a negative belief about themselves, others, and the world, and they had a sense of hypervigilance, and that was somewhere on the order of 44 to 48 percent of them felt that way. When you look at what the language was on that, what that tells me is that there is absolutely a gap in research of is that vicarious trauma then, right, because that sounds like a change in the cognition of one's self and the world. So, you know, while this was a fantastic study, it kind of takes you down this path of like well what could be further, what can we study more to actually answer the question? If it's not PTSD and if it's not secondary stress, then there does need to be research on whether or

not it's vicarious trauma, because words like that tell me that there's definitely a chance that it could be.

**Heidi Eldridge** [00:16:10] Yeah, and that's really interesting because we have these people who are experiencing potentially vicarious trauma as CSIs, but even though so many of them did, it was still less than 50 percent. And that makes you wonder why it wasn't 100 percent. You know, is it that the other 54 percent of people hadn't experienced the same things, so they hadn't reached that level of distress or they hadn't experienced it long enough? Or was it something in the character of those people entirely and their personality traits that they were able to resist the pernicious effects of what they'd seen? You know, they'd seen this horrible stuff but they were just - for want of a better word - more resilient. I know one of the studies that you reviewed in your paper Mairean and Turliuc, you had down in your paper the 36 percent of the presentation of vicarious trauma that they found in their subjects could be explained by big five personality traits. And we should probably take a moment and tell our listeners what those are in case they're not aware of them. But essentially, they're looking at this notion that some people are inherently just more resistant to trauma than others. And this is something that I think - correct me if I'm wrong - but to a certain extent can be tested for. Which brings up a lot of questions about, you know, pre-employment screening, selecting people who might be better set up for success in these kinds of situations, or even giving applicants the information they might need to self-select. I don't know, maybe you can talk a little more to that study.

**Donia Slack** [00:17:40] Yeah, you know, it's really interesting and this reminds me of a previous podcast that we did. I think it was called Just Stress and Resiliency in CSIs. That was one where I interviewed two crime scene investigators - I think one is still practicing, one might be focusing more on the business, but they train CSIs in many of these management topics - and we had this fantastic conversation about personalities, and how does that really impact your job and your ability to do your job? And they found that, you know, it did. And one of the ways to kind of mitigate for that, because no one wants to tell you, you know, if you have a dream to be a crime scene investigator, you don't want to tell someone, well, don't do it because your personality type might not be well-suited, but what you can tell them is this is your personality type. As long as you're aware that this could be affecting you, understand that there are coping strategies and there are areas where you can actually reach out for help when you do get stressed, right? Because in any given day, yes, you might have one horrific death scene, but you could go through weeks of just doing simple property crimes, right, that don't really affect you that badly. And so the job is not always so terrible. It just can be. And so they had some really good insight into the different personalities, especially as it relates to the organization. So this actually leads me to some thoughts that I have on what does it look like to feel supported in your organization and what does that really mean? Because the other term that I'd like to bring up is the term burnout. And so burnout is also a really big one in this field. Lots of people have looked at burnout across all types of disciplines, but burnout is really the gradual accumulation of stress due to overload and stressful working conditions. So this can lead to a detachment from your job and it can actually overlap with depression. There have been studies and one in particular that I'd like to call out is one that was done by Andrew Levin with NIJ funding and was just released few months ago, actually, in 2021. He and the group of researchers, they looked at secondary traumatic stress and burnout and compassion satisfaction. So they wanted to know were there differences in secondary traumatic stress and burnout and compassion satisfaction between field-based scientists versus laboratory-based scientists and their managers. So they actually looked at three different populations there. They had a really good sample size - about four hundred and

nineteen that they used for the statistical analysis, but 70 percent were female, which several of these studies, especially as we go later on in the years, the majority of the sample set now is looking to be female. But they were able to look at burnout between the field-based scientist versus the lab-based scientist, and there was no significant difference, actually, between burnout - secondary traumatic stress, yes, they were able to see that there were some differences, but when it came to burnout, there was no difference, and there was no significant difference with burnout between the lab-based scientists and managers. And one thing that they did note, though, is that there was no difference between the groups, but all of them were experiencing burnout. They all had it so there was no difference in that one wasn't burnt out and the other one was, it was just that they were all pretty much felt burned out. And so the one thing that they did find that the variables that were really different between them and the statistical difference between the groups was working with victims' families and testifying - so the analysts that had to testify more often actually did feel more stress and did feel more burned out. But the greater belief that the employees felt that their organization was actually supporting them in this topic, the lower the occurrence of burnout and secondary traumatic stress. So this just shows that sometimes what is really needed is for individuals to know that their leadership understands their daily pressure and that they care about it. Sometimes it's as simple as that to just say we're all in the same boat together whether you're the manager, whether your field based or whether you're laboratory based, we are in this together. We understand the pressures of the job and we support you in ways that will help you in your position.

**Heidi Eldridge** [00:21:55] I think that's a really important point because, if I understand correctly about burnout, it's often associated with the organizational structure. And if you look at the things that we've talked about already that could affect your propensity to experience secondary traumatic stress or vicarious trauma, it seems like the three things that could really affect you are your personality, the things you're exposed to, and the organizational support you receive. Well, looking at the three of those, there's really only one we can control, right? You can't change a personality. You can't change the demands of the job. You're going to see what you're going to see. But we can change that organizational support piece. So it seems like when we're looking for solutions, that might be the place we should start off looking because it's the one thing that we can actually affect change in that might help people.

**Donia Slack** [00:22:46] I could not agree more. That is the lowest hanging fruit, especially if it's just the awareness - so making managers, making leadership aware that this is a problem and that's why research does need to be done, right. If leadership doesn't believe it's a thing, or if they do not believe that there is such a thing as burnout in their workforce or even vicarious trauma, then they're not going to really put any resources towards it. And resources doesn't really have to mean a lot. What's really interesting is that if you look at some of the coping mechanisms that have been exhibited specifically by forensic scientists, Craun and Bourke looked at a field of forensic scientists who look at the digital, disturbing evidence, and they found that one of the easiest ways, one of the easiest ways that an organization can support the scientist when it comes to this is allowing peer-to-peer debriefing - something as small as just saying it's OK to have a safe space to just sit down together, talk through the case, and discuss it with each other - that can go a really long way and reduces burnout. A lot of times people will say, well, everybody's burned out. Every field experiences burnout. However, one thing that I like to tell people and this was demonstrated by a study by [00:24:01] **Ultmer et. al in 2018**, [1.2s] is that not only does burnout actually lead to lower productivity and increased turnover and impaired cognitive performance, you actually will see that when employees are experiencing this negative

environment and burnout, they actually have this shift in their ideas of work where they are now unambitious towards the work. They don't really care about the work. But what's really interesting is that they are not turning over. They are actually just sitting there in their job, unhappy, not caring about the work. And that's almost 50 percent of the individuals that they surveyed. So now you have an entire workforce that is staying in the establishment, and now they're unproductive and unambitious. And then that leads to mistakes and that leads to disengagement. You actually do an analysis of what is the actual economic impact to burnout - you now have excessive absences, excessive leave, and actually an impact to your medical and health benefits because these individuals are actually having health issues like serious health issues - heart disease and other chronic diseases - that now impact the organization. That's where I come back with, well, this is why you should care, not just about the person, because I believe you should care about the person. But if you look at this, the numbers alone about how is this actually impacting the efficiency of how an organization should run - it matters.

**Heidi Eldridge [00:25:34]** Well, and it's not helping the criminal justice outcomes, either. When people are apathetic and, you know, making mistakes, you're going to have miscarriages of justice.

**Donia Slack [00:25:42]** Correct. That's also a gap, too, where a lot of times studies will be done to demonstrate that there is a problem. But, you know, I would like to be able to show the community that there is an impact to that. One of the things that I believe needs to be looked at and it could be easily done through something called the Workability Index - it measures a worker's ability at present and in the future to perform their duties with respect to the demands of their job, their health, and their mental resources. So it's just a very short survey that actually just determines based on your current present state, are you able to perform your job duties? And this instrument is actually really good at predicting how you answer it today, how this impacts you later on, because it does ask you things about, well, in the last 12 months, how often had you had to go to the doctor for something that was a little bit more chronic or more serious? It does ask you these different questions that actually measure your ability across multiple different areas that actually impact your job performance. So I think that that's a gap in the literature, too. It's one thing to say yes, there is a problem, but let's demonstrate to the community, well, what does this mean to the problem and what does this mean to the criminal justice outcomes based on those problems? Because to me, one of the things that forensic scientists feel the most pressure about is the idea that they have to get it right. They have to make sure that they are 100 percent sharp when it comes to how they are presenting evidence or analyzing evidence and when that's impacted, it impacts the case. So again, it matters.

**Heidi Eldridge [00:27:20]** Yeah. And I think that actually leads us to another point, which is we know there's a problem even with the limited data we have, we have enough to know that this is something we should care about. And we know, as you just spoke about, why we should care about it - it does have impacts to the criminal justice system. It does have impacts to the organization. But there's kind of that middle piece in between knowing there's a problem and knowing we should care about the problem, which is how do we prove the problem or the extent of the problem or the moving parts of the problem? And that's where that research gap exists, right. We need to have good research that helps us to measure and quantify and name the pieces of the problem so that they can be addressed so that we can find potential solutions and then test and validate those solutions. And so I think that bears some thinking about and discussing too is what kind of studies do we need to see? For instance, one of the studies that you mentioned in your literature review, the Adderley and Smith study, I thought was interesting because they

went and measured heart rate in CSIs during scene processing to take that as sort of a proxy for stress - they measured their heart rate while they were doing paperwork and they measured their heart rate while they were processing crime scenes, and they saw that, well, their heart rate is higher during crime scene processing, which an easy conclusion to that would be, oh well, crime scene processing stresses them out, right? But it could also be that crime scene processing is physically strenuous. You know, I've had crime scenes where I was climbing around in an attic, in 100 degree weather - that's going to elevate my heart rate. Or it could be, as you just mentioned a moment ago, stress about doing the job right. You know, I haven't done a shooting reconstruction in two years, and yet here's apparent suicide, and I'm responsible for taking correct measurements and drawing the correct conclusion. That's a lot of pressure, which could also add to your stress levels. So it might not be just the stress of the scene, but your heart rate could be up for different reasons, and it becomes difficult to tease those things apart. So I think it's really interesting to look at studies like that and say, OK, we need more studies like this, but we also need to make sure that we're measuring things in a way that it's telling us something useful and actionable.

**Donia Slack** [00:29:35] One of the qualitative studies that was done actually looked at some of the stressors that crime scene investigators experienced in the field. And you know, one of the things that I know was really impactful is whether or not that scene was completely secure from outsiders, right, and more specifically, the families - it was one of those.

**Heidi Eldridge** [00:29:59] It was the Sollie and Kop study.

**Donia Slack** [00:30:00] So that study was really interesting because they actually felt the most stress when it just happened the scene had family members or the victims themselves still telling them these things that they have to hear to be able to process the scene properly. One thing that was really interesting is that there was a study, Clark et. al 2015, they actually surveyed 51 crime scene investigators, and they said that they actually felt less stress when the perpetrator or the victim was already dead because at that point they knew that they didn't have to interact so much with a living being or hear any of that. And they also knew that they didn't have to go to trial when it came to being able to testify to certain things.

**Heidi Eldridge** [00:30:42] I know in my personal experience I had a scene similar to what you're describing where I was doing a crime scene that was in a public place - it was in an intersection. So there was people coming by and a child had died. It was a vehicular accident, and the mother found out about it from the evening news and came down to the scene while we were still working the scene and promptly lost her stuff all over the place, which of course she would. But trying to work this scene and hearing this distressed mother wailing, we never talked with the mother. We never interacted with the mother in any way, but just the fact that she was there and you could hear her and you knew what she was going through as you're looking at, you know, everything that's happened in the scene - absolutely, that makes it so much worse than when you're just showing up and you have a dead body and it's like a puzzle to solve. You're able to distance yourself from it. But once that human emotional component shows up, it's a whole different ballgame.

**Donia Slack** [00:31:37] And it goes back to what you're saying of making sure that the studies are actually capturing what are you really exposed to so that you can make these statistical correlations. And one of the things that I really like about Dr. Brondolo's work is that she developed a case exposure and family contact scale. It's a short scale. It just



assesses the frequency and direct and indirect exposure from 12 different types of potentially traumatic cases. So, you know, determining have you been exposed to these seven different types of disturbing deaths or these five different types of disturbing human remains? And then also determining what is your level of face-to-face contact of the family of the deceased, or even contact through calls or families with the deceased? So even just using that as almost like this demographic level setting of, you know, there are some forensic disciplines that might be so far removed that they don't have a lot of that interaction. But then there are some in the middle, and then there is the one that you just explained actually processing this death scene where you do have this contact and it's not even face-to-face, but this indirect contact with the family of the victim, and then the victim themselves. I mean, I know you and I are both mothers, and so there's a very real and visceral reaction that you have seeing the death of a child. That's really tough.

**Heidi Eldridge** [00:32:57] Oh, yeah, definitely. I mean, I had my daughter during my crime scene career, and you definitely notice the difference with how you react to those cases before being a mother and after being a mother - it's not the same.

**Donia Slack** [00:33:09] No, I can imagine.

**Heidi Eldridge** [00:33:10] So I think we could switch gears here a little bit and move forward. We've talked a lot about the problem and we've talked a lot about the gap. We've only sort of tangentially hinted at the solution. I know we talked briefly about this idea of a support system or of being able to talk with your coworkers. I'd like to explore that a little bit on a couple different levels. First of all, just the idea of sitting down and having time and space to speak with your coworkers about the case, I think, is really helpful. But I do wonder about the content of those conversations a little bit because I feel like when your coworkers are your friends, that's great because you have a built-in support system there. But when you're talking to just a coworker about a case, how much are you talking about the content of the case, like the business aspects of the case versus how much are you talking about your feelings about the case? It's one thing to sit down and say, well, you know, we just did that scene together. And boy, it sure sucked. But let's talk about the bloodstain patterns and what they meant versus, you know, I sat down and wow, that one really impacted me. I'm reeling from that. I don't know how much those conversations are taking place in the workplace. We're not allowed to talk about these things with our family and friends because of confidentiality because there's an ongoing investigation. Normal people have a hard day, they go home and they tell their loved one about it, and we're actually banned from doing that. All we can do is say, I had a scene today, it sucked, which leaves us only our coworkers who we may have or may not have a close friend relationship with.

**Donia Slack** [00:34:46] It's interesting. I'll reference back to the Craun and Bourke paper again. They were the ones that said that this peer-to-peer debriefing is the one that could be the most impactful. And it's also because not only can you not go home and discuss a lot of this confidentiality of a case, but many times, even if you could, you don't want to, right? Like you don't even feel comfortable going home and telling your spouse something where by the end of a three-minute conversation, I'm sure their faces are like, what? Oh my God. So, you know, it hits a point where it's like, well, they don't get me, they don't understand what I do and to, I would say, a large extent that's most likely true, right, that spouse, unless they're in the same field. And so this is where that peer-to-peer debriefing comes through. And I think to your question about, well, what does it need to look like? The paper kind of explored this where there might not need to be a lot of confines to it, right, where it's just a safe space of it's OK if you're going down the path of gallows humor.

So gallows humor is really when you make fun of a disastrous situation, but it's usually never at the expense of the victim. It's usually just kind of gets that dark humor that everyone in your same situation, your peers will understand, but an outsider like a spouse or a bystander would say, oh my gosh, what's wrong with you? Why would you joke about that, right? Gallows humor is how a lot of times trauma victims get through a day - they have to make light of certain things so that it helps them. And when you have other peer-to-peer networks that can actually understand it, then it actually is a really healthy way to decompress. When peers are able to, in a safe space, decompress and discuss and have this gallows humor safe space, they actually are able to determine when these more yellow flags raise, right. They're able to see from one another of like, hey, we're all just kidding around, but sometimes when someone is kind of a little bit more on the broken side, they'll say things and because it's a little bit off-putting or a little bit too far, they start noting of like, hey, I think- I think this is a red flag, like, are you feeling OK? So it's a nice way to kind of check each other as well. Now what's really interesting, I think about this because you just said it yourself, right, like, you're not always friends with all of your coworkers, right? One of the easiest ways that leadership can ensure that there is this more group mentality is reducing the amount of the shift work that actually toggles into different shifts. In this field, you have to do shift work because crimes don't happen from nine to five. They also actually more traditionally happen after 5 PM.

**Heidi Eldridge** [00:37:19] Yes.

**Donia Slack** [00:37:20] But, you know, instead of mixing and matching, well, you're going to have mornings on Monday and then an afternoon on a Wednesday and then all the different groups are mixed groups. It's kind of nice to set up these cohorts of individuals that tend to do the same shifts all the time because then they tend to form bonds. And the bond between the individuals actually takes precedence of any of the other stressors that they're feeling and that actually is one of the easiest coping mechanisms is to actually form these human bonds with peers so that you can have these healthy discussions.

**Heidi Eldridge** [00:37:57] And you feel safe to do it because you're with a cohort that you've built this relationship with. What about some of these other strategies that have been mentioned in the literature, like mindfulness, exercise, prayer, meditation? I know there's a movement to sort of encourage organizations to make space for these under the theory that if you're generally in a more positive mental place, that you'll be sort of inoculated against these traumatic events to some extent. And that sounds like a really good idea. Have we had any longitudinal studies and if we were going to apply these kinds of strategies, how best would we do that operationally so that it was sort of giving people what they needed, but not too negatively impacting the job that they're there to do?

**Donia Slack** [00:38:41] This is one of the reasons why I think Dr. Rineer - so we interviewed her this season as well - I think studies like that are extremely needed right now because, like you said, it's one thing to say, yeah, absolutely, you know, this is the way to solve it. It's a whole nother thing to actually do the analysis, like actually do an evaluation. And that's where she's going with her phase two - the app that she's developing and measuring pre and post. And that's really important. So the Department of Defense has actually done a ton and have- had put a lot of money into researching this, and they have actually shown that yoga was shown to improve sleep with military members. It reduces their feelings associated with PTSD, and it also reduces rage, anxiety, emotional reactivity, and it has been used to actually treat depression and chronic pain in military personnel. So I mean, literature has actually shown this. Another person that we've actually had on podcast and a webinar - we've done several things - but Amy

Jeanguenat, so she was at Bode Technology as a lab director for many years and five, six years ago, she was burnt out, and she has taken this really interesting journey towards mindfulness and wellfulness, and she's now spreading the wealth. You know, she goes to different crime laboratories and different organizations to teach them about mindfulness, and I believe she's a certified yoga instructor now. And even if the literature right now in forensic scientists is lacking at the moment, it certainly can't hurt to like just decompress even a few minutes. And these types of mitigations certainly could not hurt. But I do agree that we do need to put some empirical research on it so that we can close the book and say, yeah, you know, there's a problem and there are ways to mitigate for them, and there are data to actually demonstrate that it did work.

**Heidi Eldridge** [00:40:29] Yeah, I think that's great. And I think we're seeing throughout this season and throughout this discussion that there's so much research in areas that seem like they should apply to forensic science, but less research that is specifically aimed at forensic science. You know, I think we've highlighted even with our own goals, that this is a need, which I think actually segues into my next question, which is tell us about what you're working on with your Ph.D., Donia.

**Donia Slack** [00:40:57] So I am in the midst of going through and on working with my committee on which instruments that I would like to be able to put out there. In my mind, I'd like to be able to determine whether or not we are experiencing more on the vicarious trauma side, burnout, or a combination of both. Is that related to how much case exposure and the types of case exposure, whether that's field-based or lab-based, does it correlate with that? And then I'd like to determine if there are instances of vicarious trauma and/or burnout, is it actually affecting your work ability? Are you able to perform your job or is it impacting it, and can we predict that it could impact it later? So I am looking to put forth a study here - I'm hoping for early 2022 - to assess the frequency of case exposure, family contact, and then correlate that with vicarious trauma using the TABS scale. So that is the same scale that Raunick used for her SANE study. And then I'm looking at a couple of different burnout instruments. I know that with the Levin paper, he looked at burnout, but it was also intermixed with other instruments where it was looking at secondary stress. So I'm looking at just burnout. There's a couple of those that I'm looking at to incorporate. And then the workability index. So that's my hope. That's the plan. One of the things I'm finding is that many of these instruments that are used in the clinical and psychology realm for either actual diagnosis or for studies, you actually have to pay for each one - every time one survey is actually put out, you have to pay and that adds up very quickly, especially where student research is involved. So it's really important that when people want to do these studies that you choose the instrument correctly, make sure that it is one that has really good reliability and reproducibility that has been studied in the field. It's now been noted as a true need by the National Institute of Justice - put in a grant, ask for the funding. There are student grants that are able to do this. There is the traditional R&D grant that comes out every year. There's the one - the crime lab partnership one because you have to make sure, too, that this is relevant to the population. So collaborate with the crime lab so that we can actually point back to the data so that when Congress has to determine where funds go, there is hard evidence that shows that there is a problem and this impacts the criminal justice field, in general, it impacts public safety, and that there needs to be resources put towards it, period.

**Heidi Eldridge** [00:43:31] That's a really important message, and I think it's very encouraging that, you know, NIJ has named this as a priority, that we are starting to see these topics come up more often in journals and more often at professional conferences, and it seems like awareness is starting to rise. Now we need to push for research and

solutions. I think it's great that you're working on this in your own research. I'm going to put in a quick plug that, you know, Donia is going to be launching this study soon, and she will need participants. So any of our listeners who are active forensic science professionals who would be interested in partaking of Donia's study, please keep an eye out for when she announces that she's recruiting, and we would love to have all of your data to help her reach conclusions that could help you in your work. So thank you for doing that, Donia.

**Donia Slack** [00:44:22] And one thing I wanted to also kind of end with is that while we're waiting for research to be done and for literature to continue to grow, one thing that I did note from the literature review, and there was a study done by Salmela-Aro 2018, and they looked at- and this was a non-forensic scientist population - that they looked at over 4500 employees and they looked at early, mid, and late career employees and looked at burnout. First off, women actually experience less burnout than men. So that's really interesting, especially as we're looking now that the field is now going a little bit more predominantly female. But outside of just the differences between males and females, what they learned was that early career burnout is usually attributed to economic problems, and a paper by Dror and Jeanguenat, they actually noted that the mean annual wage for forensic scientists is sixty thousand dollars a year, right, and that's just the mean wage. So early career burnout, one of the easier ways or more straightforward ways to be able to mitigate some of that burnout is being able to compensate the workforce appropriately. It's always jarring to me, sometimes some of the wages of this job arena and the fact that we are expecting these professionals with bachelor's, master's and sometimes Ph.D.s to perform at this very high functioning level and it doesn't always correlate to a properly compensated workforce. I know it's easier said than done. And then with the late career burnout, the one thing that was really noted was caregiver demands. So later on in life, people really now they have a more complicated family network - possibly married. You have children, you have aging parents. And having the support from leadership to be able to take care of your life demands when it comes to the people around you actually reduces burnout significantly. If you have the support from leadership to be able to have a more flexible - I don't want to say Work-Life Balance because I'm actually not a massive fan of that term - but more of an understanding of work-life integration where your leadership is really understanding that you have other pressures that you have to take care of at home. So I would be remiss to not mention that one study because I thought that that was a really interesting mitigation to some of the stressors that we're seeing.

**Heidi Eldridge** [00:46:41] Yeah, no, that's a great point. Thanks for bringing that up. So I think we've come pretty much to the end of our time for today. But thank you so much, Donia, for joining me and for discussing your work and helping me put a button on this season.

**Donia Slack** [00:46:54] Thank you!

**Heidi Eldridge** [00:46:55] And to all of our listeners, if you enjoyed today's conversation, be sure to like and follow Just Science on your podcast platform of choice. For more information on today's topic and resources in the forensic field, visit [ForensicCOE.org](https://ForensicCOE.org). I'm Heidi Eldridge, and this has been another episode of Just Science.

**Voiceover** [00:47:16] Next week, Just Science sits down with two forensic scientists to discuss the importance of diversity and inclusion in forensics for a special release episode. Opinions or 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.

