

## Just Off the Shelf Forensics

**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 the final episode of the case study season, Just Science sat down with Tim Schade and Brian Cochran to discuss off the shelf crime scene processing products. Budgetary concerns often plague smaller forensic labs and law enforcement agencies. Scene investigators might realize that some of those expensive forensic tools might not be attainable for their scenes. Savvy shoppers such as Tim Schade and Brian Cochran combined ingenuity with experience to find budget friendly solutions to crime scene processing problems. Listen along as they discuss their methods, repurposing existing materials and hunting for over the counter solutions in this episode of Just Science. This season is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Here is your host, Dr. Mike Planty.

**Mike Planty** [00:01:26] Hello and welcome to Just Science. I'm your host, Dr. Mike Planty with NIJ's Forensic Technology Center of Excellence, a program of the National Institute of Justice. Here to help us today are guest Brian Cochran and Tim Schade. Welcome to the program.

**Brian Cochran** [00:01:40] Thank you.

**Tim Schade** [00:01:40] Thanks.

**Mike Planty** [00:01:41] Brian Cochran is currently a detective with Boone County Sheriff's Department with the responsibility of crime scene investigation and evidence processing. He is a 23-year veteran of the department. Prior to being assigned to crime scene unit, he worked with a multi-jurisdictional drug task force, was a case detective and was responsible for covert electronic surveillance. Brian is a member of the International Association of Identification and is an instructor for the National Forensic Academy at the University of Tennessee. Tim is a training consultant with UT's Law Enforcement Innovation Center since 2017. Tim has over 28 years of crime scene and forensic experience with the Knoxville PD. He is a certified latent print examiner through IAI. Tim has performed training for the National Police Academy and the Citizen Police Academy. So, our topic today is a pretty good one. When we start thinking about budgets and agencies are facing these days, it's on over the counter solutions for crime scene investigators. So we're going to cover the several ways that crime scene technicians and investigators can utilize off the shelf items from big box type stores to process crime scenes. What is the concept of off the shelf forensics and why is it important to law enforcement?

**Brian Cochran** [00:02:53] There's a lot of things that we can do without having to buy things, purchase things from large forensic companies. Not that those companies are bad, but there are a lot of reasons to use things locally as opposed to going with those companies. As far cost goes, you mentioned that already. A lot of times the cost is lower if you go with these off the shelf solutions and a lot of times, especially in these days also the supply chain is severely affected by things like Covid, and sometimes we don't have a choice but to work with what we have locally. So that's another thing. But the big thing with

the cost is, is a lot of times what we see with law enforcement agencies, it's not necessarily the larger agencies that have the problem, but a lot of times it's the smaller agencies where the officers themselves are the ones that are buying the supplies to do their jobs. So this gives them a lot more access to those tools and it keeps the cost down to something reasonable to where they can still achieve these things.

**Mike Planty** [00:03:54] Tim?

**Tim Schade** [00:03:54] Another thing about it is nothing is really built for forensics, really. I mean, all the things that are used in forensics have been adapted for another use and people in forensics have kind of adopted those things and made it their own. Whenever you buy something that you're creating from a previous idea or from an original idea, you're making it specifically for a forensic application, which makes it a little bit easier for you to build it the way you want it.

**Mike Planty** [00:04:23] And customize it to your, you know, application process, right? So how did this idea develop for each of you? You know I mean, was it you know, you ran out of supplies one day and you're like, I'm just going to go hit the Home Depot and or whatever, and then you just realized, that you know, there are things here or was there some other, you know, event that, you know, you thought maybe we should be just checking out these other sources.

**Tim Schade** [00:04:45] For me a lot of it was out of necessity early on. I noticed that early on, just that at one point we did not have the type of vacuum that we could use at crime scenes to collect evidence through vacuuming and early on, I tried doing stuff with coffee filters and things like that and creating my own piping system to be able to collect things that way. So a lot of it is just - can't necessarily get something ordered and just try to create something that's on its own.

**Brian Cochran** [00:05:14] The pivotal one for me was I was working in an officer involved shooting and there were somewhere upwards of 40 rounds fired. And due to the nature of the reconstruction, it would have been valuable to have both the bad guys rods and our officers rods all in the same location at the same time. And we just didn't have that many rods. Our forensic kits maybe had half a dozen for shooting scene reconstruction. So what we did was is we went to Home Depot and bought the flat fiberglass rods that you use for marking your driveway in the snow, and then we were able to do two different colors, able to cut them. They looked very professional, and we were able to adapt. That way we can get that scene marked without having to hold it for too long.

**Mike Planty** [00:06:01] Interesting. And I'm sure there are cases, and maybe we could touch on these a little bit where, I think Tim mentioned it, through trial and error. You're like maybe I'll try this, and it just didn't work out. But in other cases, yeah, it worked perfectly compared to what you could get through, maybe some of those traditional law enforcement supply chains.

**Brian Cochran** [00:06:20] I can say that specifically for that case with the shooting scene reconstruction rods, we were very fortunate that most all of the rounds were 40 cal, so the rods from Home Depot were a much bigger diameter to fit in to those bullet defects as opposed to the smaller rods that were more difficult to adjust, to lay in the defects well. So having the higher diameter rods was actually advantageous and now we have a whole kit of those that have been purchased from Home Depot.

**Mike Planty** [00:06:52] What about you, Tim?

**Tim Schade** [00:06:53] Yeah, that's one of the things that through the National Forensic Academy that we challenge people to just do whether it's your latent print development, shooting reconstruction, whatever it is. What I found is I've been shopping with Brian in stores before too, and we're kind of walking through stores and we see something that kind of triggers a different response than what it was originally created for, and we try to figure out some other way. Whenever you see something like that, and you see the size of it and you go oh that's about the size of a 22 or a 25 and you're going I think we can do something with that. I mean, just shopping in stores is completely different. I'll be with my wife shopping, and I'll stop and then, you don't need that. No, this will be perfect for this application. It just changes kind of the way you look at it.

**Mike Planty** [00:07:34] Yeah, yeah, you just thinking from - and some of these things are just whether it's paint or kid's toys or something, you're always - your mind's probably always churning like, well that could be something that could use on the job and just bring along.

**Tim Schade** [00:07:46] It happened just this last weekend where my wife bought this toy, she does a lot of childcare and stuff, and it's kind of an X-ray reader that has a lighted base for you to be able to look at X-rays and put a kind of a skeleton together. And whenever I saw it, I was going we need that exact same thing just to get that lighting for photography this is perfect. So it's one of those things I go, I need to know where you got it, how much it was and what all we can use it for and it was just perfect for something like that. So yeah, it's kind of a weekly thing something pops up.

**Brian Cochran** [00:08:19] And I just recently had one where I went to a wedding and the tables were all marked with numbers, and we recently had a drone unit formed and the old conventional evidence tents were all designed so that you could read the numbers and take good pictures from the ground. And those table numbers are all flat. They're black and white. They're very good contrast for photography. So now we lay those numbers down as well as our photography from the ground so that when we fly the drones over a scene the drones can read those from the top down very easily.

**Mike Planty** [00:08:55] Oh, that's excellent. Yeah, you're always on your game here, right? In trying to look - almost like a MacGyver. I don't know if I'm going to date myself with MacGyver, but it's definitely that, right? You're just trying to repurpose materials and to think about, that's a better way. And that's another point here, right? As the tools of the trade and even the types of crimes - things evolve. You have to constantly think about the ways you're going to collect and identify evidence at a crime scene. It sounded like there's a lot of examples in latent print but is there any one discipline or field where you find these tools most useful or it's just across the board, you just, you know, you come across something you know like, oh, yeah, that's going to work in this area.

**Brian Cochran** [00:09:36] I would say across the board not - I hate to speak for Tim, but I think he would agree that a lot of things lend themselves to applying things that are off the shelf solutions. And I think we could probably point to something from everything from fingerprinting deceased individuals, all the way to shooting scene reconstruction, bloodstain analysis, all of those things. I don't think there's a thing that we couldn't come to the table with something that would be valuable to that decision.

**Tim Schade** [00:10:08] That's the thing about both Brian and myself. We were kind of generalists in the sense that whenever we went out crime scenes, we would take care of every aspect of that crime scene. That was something that the size agencies that we worked at, we worked at agencies that had a little bit of money that could buy you some pretty good stuff. But we also were not specialized to the point of - or if we went to a crime scene, we were a photographer only or we only did latent prints. I mean, we went there, and we were the photographer, we did latent prints, we did the diagraming, we did the sketching, we did every aspect of that crime scene. So we're not limited in any approach that we look at it based on how is it going to help for this one specific thing? Although the one thing that Brian and I - what we teach at the National Forensic Academy is latent print development. A lot of the stuff that we work on are things that make latent print development better.

**Mike Planty** [00:11:02] Got it. I guess one thing that kind of comes up in general is that when you do rely on, say, over the counter solutions, are there any issues with quality or, you know, concerns about, you know, affecting the documentation later on? Or is it not really a big concern?

**Brian Cochran** [00:11:20] I think that one of the catch phrases that we see a lot now in the forensic community is reproducible science, and when we do something with off the shelf type items, we try to do it and we try to share it amongst - not just something that I do, but I share it with Tim or Tim will share something with me and we will try it. We will experiment with it. For instance, we developed latent prints in blood on dark surfaces with a product called titanium dioxide, which is a powder that makes the paint like in the wall behind you, white. It's a powder. We mix that with methanol. Now, the titanium dioxide is fairly available from paint suppliers, things of that nature. Methanol, however, is not. So when we substitute the heat fuel line cleaner in the yellow bottle is just about one hundred percent methanol. So what we do is when we have time that Tim and I are in the same place at the same time, we will run side by side comparisons of the paint titanium dioxide with the fuel additive versus laboratory grade titanium dioxide and laboratory grade methanol. So we try to do comparisons and have some reproducible science and experimentation to back that up for when we're on the stand.

**Mike Planty** [00:12:39] Yeah, I guess that makes the point, right? You don't just wait till you're at the scene to try something new, right? Maybe you do or, you know, off the cuff but yeah, you're right. So if something's going to work, it doesn't take much effort to figure out, for instance, you know, if the rods are going to fit, like you just explained, whether a certain product is the proper substitution for one that you've been purchasing a different way. Excellent. So maybe we just jump right into some of these ideas. You have this application of Android and Apple based systems for forensic purposes. Talk a little bit about those - the endoscopes?

**Brian Cochran** [00:13:11] Yeah, the Android devices in particular. One of my most favorite things that we get to do is, is when we take phones from bad guys, we get them forfeited to the agency. Then we have free phones. And if you think about phones - it's really an amazing forensic device. It is a GPS device. It is an excellent camera now. And the Android devices in particular also have this function that's called OTG, which is on the go. And that function allows us to have the Android device work as what we call a master so it can control another device rather than just being a storage medium. The real advantage of all that is, is that we can plug in things like endoscopes, things of that nature into the Android phones. And that helps us to look into small spaces, inside doors for bullets, at defects in walls - gives us a lot more view that we didn't have before. And again,

when we're using these things that we have seized and forfeited, that's really good use of resources.

**Mike Planty** [00:14:14] Some of these things like the phone, the development of a phone, like the Android, the personal phone, I mean, just even five years ago, you think about the evolution of that and how the clarity around the camera just makes real sense to utilize that.

**Tim Schade** [00:14:29] And the endoscope - the thing that he's talked about - he had brought that to my attention and I had used it quite often. Just like shots into a car, it gets into the dash area. You can't just go through and take the dash apart, but if you snake that through and be able to find it, it worked out real well. You can buy them that have things that you can grab on to things with it. Or if you get a shot that's into a wall, and you don't know how low it fell down into that wall - just snake it down in there and you can look and find them much easier.

**Mike Planty** [00:14:57] And like you said that - they're relatively cheap, right? The endoscope. You know, Amazon these days, you can find anything, right?

**Brian Cochran** [00:15:05] Again, it comes down to cost. Can you buy a professional endoscope set up? You can, but you're talking thousands of dollars versus putting in the hands of more people - it's the advantage.

**Mike Planty** [00:15:17] The aspect of 3D scanning with these phones.

**Brian Cochran** [00:15:20] Well, previously, I would have said that the idea of one phone to have would be an Android based phone. But Apple's recently come along with not only their camera technology, they've caught up to a lot of the Android platforms, but they include in the new iPhone 12 there is lidar for 3D mapping. And there are some companies now that are doing some 3D mapping with those phones. I haven't gotten one yet. I've been looking at some software packages. I'm hoping that we get one of those at some point that we can forfeit so I can experiment with it a bit. They have some 3D mapping. There's a couple companies out there that are really pushing the envelope of what can be done with a phone. There's some proof of concept out there for some basic things. But I really think that we're going to get to the point where, at least on a very small scale, we can scan some things for forensic purposes with the iPhones.

**Mike Planty** [00:16:20] Can you talk a little bit more about the types of things you would scan?

**Brian Cochran** [00:16:23] I would think we'd do smaller areas, a room, perhaps. Things where a body's relation to a bed or a body's relation to some item of evidence is very important. That would be - or how the body is left. I think that would be one of those things where you would do smaller areas with these lower grade scanners. It could be advantageous. Whenever we can do a better job of presenting a true and accurate representation of the scene to a jury. I think 3D scanning, I think we all agree in the forensic community that's going to be a standard here at some juncture for certain things and I think that if we, again, can put that scanning, even if it's to a lesser degree in the hands of more people, that would be advantageous.

**Mike Planty** [00:17:14] So what's next? Snow print enhancement - what you got there?

**Brian Cochran** [00:17:19] We always have issues with snow because our snow is fleeting as well. And when our snow is fleeting, it's much more difficult to photograph. Usually by the time that people wake up in the morning and we're going to see a snow impression, that suckers already melting. So we don't have the super cold temperatures that some other agencies do. There's a bunch of sulfur techniques out there. There's some really neat techniques for snow impressions. But we have a harder time because ours are not lasting long. A lot of times we have slushy impressions. I met a gentleman at a IAI conference one time who was promoting a product from a company that was designed for this purpose. And when I saw that, I thought, man, this can't be that hard. And so what we did was as we started looking for something that would float on top of the slush but give us sort of a matte finish, and what we found was, is that powder coat paint from Harbor Freight is a very nice tool. Because it's plastic, it will float on top of the water, not combine with the water, and really enhance your ability to photograph, in particularly a slushy print.

**Mike Planty** [00:18:31] I really appreciate your use and description of snow from being from upstate New York. When you use words like fleeting and slushy and powder kind of stuff. People don't appreciate, you know, the variability of snow. But - and Harbor Freight is just one I think most people are familiar with. It's just - and especially an online store where you can find all kinds of really cheap tools and supplies and pretty common. So, yeah, that's a great really customized application where you have a challenge trying to figure that out and you're able to come up with a solution. Again, you know, the innovation with the practitioner here is just fantastic. Finding the solutions. What about the electrolysis for cartridge casings?

**Brian Cochran** [00:19:12] The electrolysis for cartridge casings, it was an idea that we came up with while we were at the National Forensic Academy. A paper was submitted to the IAI Forensic Journal. The student brought it and said, what about this electrolysis? The interesting thing about the electrolysis was, is that Tim and I had both got to meet the gentleman. His name is Dr. John Bond out of the UK, and he had done a lot of research into latent prints, in particularly on fired cartridge casings and some of the elements that were present, and this paper about the electrolysis really seemed like an opportunity to bring out the chemistry that he discussed in his research. So based on that, we immediately went to Wal-Mart, bought all the parts - the electrolysis on the cartridge casing. The initial - I wish I would have taken pictures of the initial device because I believe it was made up of a kick plate from a door and Tupperware tub and the acid that we used was uronic acid, which is widely available at the hardware store for cleaning concrete, things like that, that's actually a hydrochloric acid, which is what they used in the paper. When we ran that first batch, we saw some definite promise. And when we saw that we're like we need to work harder on developing this into a more sustainable process. And I think that each time - Tim and I probably get together two or three times a year at least, and I think each time we find some refinements and some different things that we can do a little bit better, but I know that I'm using it in case work, and I know Georgia Bureau of Investigations, some of their investigators are using it in case work. I've had the latent print detail developed on cartridge casings, but I just haven't got that humdinger on a fired cartridge casing yet. I got my fingers crossed, though,

**Mike Planty** [00:21:08] So NIBIN would be all over this, right? I mean, now, you know, you have all the parts there. Yeah, what you just described - a Tupperware kick plate and some acid that most people who have pools actually or clean concrete, very available. Yeah, some great applications there. What kind of innovations, you know, of over-the-counter products are you able to apply to blood spatter analysis, or?

**Tim Schade** [00:21:32] Real quick, the way this usually happens is I usually come to Brian with a problem and then he comes up with an idea and we talk about it and it ends up, most the time, working. It's usually a why can't we do this? Why doesn't this work? What do we have to do to make this work? Then we thought through it and we talk with some other people that are more - have a more chemistry background and try to figure out what direction we can go and it always seems to work out.

**Brian Cochran** [00:21:59] I mean, as far as the - we have done a lot of work with titanium dioxide and methanol and using the off the shelf solutions. It's been known for a long time and all the literature of the bloodstain analyst if you have a latent print on a dark surface in blood, there's a methanol and titanium dioxide mixture you essentially pour on it and then you rinse it off with straight methanol and it really brings about that impression. So I started experimenting with the titanium dioxide from the paint companies and the off the shelf heat that's the fuel additive, and started to get some results that I was very pleased with, especially as compared to the much more expensive solutions. And then I know that Tim and some of the students at the NFA took that even a step beyond that.

**Tim Schade** [00:22:56] One of the things that we had talked about was trying to make it fluoresce. I think that where he was kind of going with that. We kind of made that a challenge to some of the students during the latent print development week and we had some people that had some pretty good ideas and kind of mixed of some of the fluorescent chemical with the titanium dioxide and there was a lot of failures, and one thing Brian will tell you, there's no such thing as a failure. You've only learned a bad way to do something. And from that he kind of worked on this - we had a little bit of a luck with Ardrex, so he did a combination of that, if you want to talk a little bit about that.

**Brian Cochran** [00:23:31] Yeah so what we did was we added one of the dye stains that we use in the latent print week to make things fluoresce and to make things contrast more with the background is a product called Ardrex. Some of the components of that, we mix that with the titanium dioxide and what we found was is that the Ardrex dye, it's the exact same color as sort of a fluorescent yellow marker. That's the kind of color that we end up getting. And so what we do is, is we add that to the titanium dioxide, that Ardrex actually dyes the titanium dioxide and allows us to create even additional contrast in the background and get better prints.

**Mike Planty** [00:24:16] Excellent. So a lot of innovation there. And related, you know, you're talking about fluorescents, what about alternative light sources? Specialized field, but now you can get all kinds of light sources online.

**Brian Cochran** [00:24:29] Yeah, I think probably Amazon is probably the place to go. You can find some - you used to be able to find a different variety of light bulb that was very advantageous, but as technology advanced, we really can't talk about that anymore because they stopped making them like they used to. So most of the time when we talk about alternate light sources, we talk about things that we look at online, either available from places like eBay or from Amazon. And a lot of that is just trial and error. And each time I go to the NFA, I try to bring a different set - goes against all the chemistry - we were diffusing green lasers that are really widely available for about \$10 to fluoresce some of the dye stains. We were very successful with that and the way we ended up diffusing the laser, everybody's seen a green laser before, but that doesn't light up a fingerprint very well, so the way we diffused it was with a cutting board from the dollar store. A thin, one of those really thin silicone - if you shoot the laser through it, it will diffuse that light to be able

to fluoresce some prints, and particularly with Rhodamine 6G - that's a fairly useful application of that laser.

**Tim Schade** [00:25:46] I was at a Wal-Mart last week and came across this, and I don't know if I've shown this to Brian yet, but it's just one of those Great Value. It's a 60-watt equivalent LED blue light that looks like this.

**Brian Cochran** [00:26:02] Oh, wow. That's not a filter either so -

**Tim Schade** [00:26:04] Yeah and it works really well. We use it on some different body fluid, and it worked really well. So you get two of these and I think it was less than four bucks.

**Mike Planty** [00:26:17] So again, you're shopping. You're always thinking right there. Did you come across it at the dollar store, that one plate? And he said, wait a minute, I can just - or did you think you needed that and then you went to the dollar store. Which way that go?

**Brian Cochran** [00:26:30] Well, for me, I have a shop in my home and I have large stacks of plastics and stacks of metal -we're playing with all these different ideas and I had - that was in my stack of plastics and I was going through it, shining lasers through different plastics and I got down to that dollar store mat and I'm like, this is it - we can make a thousand of these for a dollar.

**Mike Planty** [00:26:51] What was Wal-Mart selling that blue light source for? Is it commonly used or it's just one of those - I guess I'm just wondering about you know the common application of that.

**Tim Schade** [00:27:00] That is a really good question. I'm not sure what people are doing, but it is definitely a good question. One thing I can tell you, what my daughter wanted in her room was those strip led lights where you could put it in any color and she wanted to have that around her ceiling. So I went and bought a strip of those and put it around her ceiling, and then she was showing me all the different lights and what I notice is one of the pictures that were on her wall, that the colors would change according to whatever light that she showed. So then I ended up bringing some fluorescent fingerprint powdered prints in and said, OK, go through the light, let me see what happens, and I have an orange barrier filter and I'm looking at it and going ok that worked, that worked, that worked. What we're doing now is we're using that strip light, we cut it off, we hook it up to nine-volt batteries and now we have something we can use remotely.

**Mike Planty** [00:27:49] Any other thoughts on the light sources?

**Brian Cochran** [00:27:51] Yeah, I think one of the things that you need to keep track of that I think we all do collectively, just like Tim has said already, is that we try to keep our eye out. When we look at light as forensic investigators, we look at it in nanometers of light. We assign a very specific wavelength of light to a color. So a lot of the LEDs, especially that you buy from out of the country and in China, are all listed as far as nanometers of light. The blue that Tim has is probably right around 460 nanometers, and early on, the UV band was 400 nanometers. And what that means is, is that's kind of your black light like you grew up, Jimi Hendrix posters, things like that. That's that sort of purple light that makes things glow. But as the technology has advanced, we've seen a lot of development in lower wavelengths. In particular the 365-nanometer wavelength, those

lights are coming out in earnest now. Really available on Amazon, and particularly if you buy them from overseas, a \$10 forensic light source and those forensic light sources work very well in particular with the Ardrex and some of our dye stains where we don't even need barrier filters and it makes photography much more efficient and I think our ALS here was probably about \$5000 and the one that I just bought from eBay was 10. Putting these tools into the hands of people that need them and at a price point that they can afford them. So now we can get those out to a lot, lot more people. The light bulbs that Tim has in particular, those are excellent for investigators working personal crimes because as Tim said, it made bodily fluids fluoresce so, any of those bodily fluids that a sexual assault detective is looking at in a case like that, those will be very valuable to them. And again, at a price point that is so low, they could go out and buy them themselves. But the real thing that we have to do to keep this, I don't know, fresh or up to date is, is we have to stay up to date with that evolving technology. Those LEDs weren't available at 365 four years ago, and now they're pretty widespread. So when you talked about this, and this was based on a talk that we did, oh, probably four years ago, I was excited because we had so much different stuff and I'm like, woah, we can't even talk about that anymore. That doesn't even exist. So we have to keep people up to date and we do a good job and Tim can talk about how we maintain that contact with folks as much as we can to make sure they're aware of these updates.

**Tim Schade** [00:30:37] Right now, we have a little over 1100 graduates from the National Academy. So we have a Facebook page that we'll put a lot of stuff on. If we find something new, we'll go ahead and put it on there and at least let the - we have also have a - the people that have graduated from the academy, we have a site for them and we try to share a lot of stuff that way. So if there's something that comes up, we'll let them know about it and then with all of the people that come in here for our 10 week program, we've gotten to share all these new things with them. Let it - let them take it back to their people. And whenever we go to conferences every year, we'll print out paperwork for new things that we've developed and figured out. Because the idea for us is that if people can solve more crimes and put more bad people in jail than the worlds a better place. That's kind of the idea behind it and really catching bad people is what we're looking to do. That's kind of our focus.

**Mike Planty** [00:31:34] So that's great purpose. And again, just hitting on the point, a lot of this technology would not be accessible just because it's not affordable for many of the smaller shops, and then when you have these differences in price, you have more tools to use and that you don't suffer at all with the quality, right? A light source is you know well, a light source for the most part and the right price point. And it just expands a tool that crime scene technicians have available and investigators.

**Brian Cochran** [00:31:59] Now I was going to say, you know, sometimes we do run into issues. Let's just say I have a \$5000 light source and I have a \$10 light source. That \$5000 light source is probably going to be significantly brighter than my \$10 light source. So one of the things that we couple with that is, is how to photograph things with a lower powered light source so, a lot of times some of these technologies have to intertwine. They have to teach better photography techniques so that you can use these. Same equipment, you're just going to have to learn how to use your equipment a little bit better. And that's one of the things we try to communicate to people that, yeah, it isn't as bright, but there's ways to work around that.

**Mike Planty** [00:32:44] So that is a good point. You know, customization or the tweaking, you know, there's solutions. Any other features that we want to showcase for today?

**Brian Cochran** [00:32:53] Yeah, I think one of the things that we talked about that is important is just the markers for marking evidence. In particular we set up a template that prints evidence numbers on fluorescent index cards that, again, you can buy at Wal-Mart. A lot of advantages to that; they're disposable, you don't have to worry about cross contamination, much easier for a road officer to carry, much more available. If you have a printer at your office and a dollar, you can get fairly professional looking markers. That makes your case better. It helps you keep track of your evidence better. It's just an easy way to go. One of the other things are the different varieties of painter's tape that are available now. We widely use that for marking up shooting scene reconstruction scenes. We use those for marking up bloodstain scenes and the real - in the old days, we would just take a Sharpie and draw on the wall. But if we do it with the painter's tape, not only does it draw attention to whatever detail we're trying to mark, but additionally, it allows us to not leave that stuff behind and we take that information with us. So there's a lot of good off the shelf stuff as far as marking evidence and such and those fluorescent index cards and we use the heck out of painter's tape. Is there anything else you can think of Tim?

**Tim Schade** [00:34:17] Just some of the stuff, and not a lot of people have to deal with this but fingerprinting dead people. Just being able to use - what I used to use a lot of is just address labels and just put fingerprint powder on their finger and be able to use the address label to get major data prints from dead people. So it's kind of a process that's pretty simple, pretty easy. Also using contact paper as a solution, because if you have somebody that was murdered, you need to be able to include their fingerprint. Quite often they haven't been arrested, fingerprinted, so, being able to get those fingerprints, those elimination print or any print you get at a scene, it's going to be real important.

**Mike Planty** [00:34:56] And those are available at any Office Depot or Wal-Mart, pretty straightforward supplies here. And that's another point, right? I mean, you mentioned it at the beginning, it's a supply chain issue. I mean, almost anything you've talked about today is widely available at these stores and accessible there, right? There's no real niche market preventing you from having these supplies.

**Brian Cochran** [00:35:15] Hey, Tim, what about your what about your tea pot? I think that's an interesting point.

**Tim Schade** [00:35:22] Thank you. My tea pot doesn't make tea, and this is something that the FBI has used. They used more of a coffee pot kind of thing, so I got this ceramic pot that is used for boiling hands. Maybe you've lost the epidermis off of the hand, you're able to boil and plump up the ridges on the finger, and it's real effective for that. You can get that for about you know \$10 \$12 from Amazon or Walmart and use it for that.

**Brian Cochran** [00:35:48] I think it's important to note at this juncture that Tim is talking about deceased individuals.

**Mike Planty** [00:35:55] Hold my coffee kind of thing, right? I guess the other thing is it seems like you're constantly evolving this one thing, right? You're always thinking about new ways, new technology, new lighting sources. And when you see that, you're like, oh, you know, maybe this can have some applications here, and so what is the larger community? I mean, you're training an awful lot of graduates so, it seems like you're also training them to think this way, too.

**Tim Schade** [00:36:17] Yeah, a lot of the people that we train aren't necessarily organizations that have a lot of money. Some of them are, but there's a lot of smaller agencies that will come here and we also do, and it maybe for a part of your audience might be good information, we also do a collegiate program. It's a three-week program that we do once a year. So we have people that are in college come and we show them the exact same thing. Whether it's using a soot method to burn something and develop fingerprints on something, something like that, we'll show that to them also. And yeah, just kind of sharing it throughout, throughout all these different organizations.

**Mike Planty** [00:36:52] Excellent. Any final takeaways or overarching views?

**Brian Cochran** [00:36:57] Try to avoid the mentality that, you know, I'm not going to do it the right way because we don't have the right stuff. There's always a way to work around that. That is probably the most frustrating mentality that we deal with. But, by the same token, the most rewarding mentality we deal with is when we share these types of ideas, whatever they may be, with somebody and they look at them and they're like, oh, my gosh, I could've use that in my such and such case two months ago. I wish I would have known this. I could have done this better. I could have collected the evidence better. I recently I had a patrol deputy contact one of the members of our crime scene unit and say, I have this tape as evidence. What do I do with tape that's evidence? You can't put that in a paper envelope. It'll get all balled up and stick to itself, and our evidence said that you need to put it nonstick aluminum foil and fold it up. And he went out, bought the nonstick aluminum foil, folded it up, and we got an excellent detail on the sticky side of the tape using some of these alternate techniques and that's the takeaway. There's a way to do it and there's people that are willing to help you. You just need to find those people. And with the number of people that Tim is training, and one of the important things to note is those folks aren't just from Tennessee, those are folks from around the country and around the world. So the good news is, is when we push things out to folks, it's not just to Tennessee. It's not just to Kentucky. It's to the country as a whole. When there's a problem, we push it out to the community as a whole and luckily through Tim, we have a venue to do that. So if there's ever someone that needs help, there is someone to help you out.

**Tim Schade** [00:38:48] Yeah and just to piggyback off of what Brian said, almost everybody that comes through here, at some point I will hear them say, I wish I knew that six months ago, a year ago, ten years ago where I had this case that dealt exactly with this thing, and I didn't know about it then. It's one of those things that you know kind of makes you almost cry a little bit knowing that that information wasn't out there then, but you know, all you can do is kind of work forward and just kind of pass it along and hope things work out. What I would say is everybody works with somebody who doesn't want to do something, and they will tell you that you can't do, you can't get a print off of this, or you can't do this. Whenever you get told that, try to figure out why. Figure out why they're saying that what you can do to overcome that and be able to get a print off of that item or that surface.

**Mike Planty** [00:39:37] Excellent. I want to thank our guest today, Brian Cochran and Tim Schade. Thank you very much. Very interesting.

**Brian Cochran** [00:39:44] Thank you.

**Mike Planty** [00:39:45] 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 field of forensic science, visit [forensicCOE.org](http://forensicCOE.org). I'm Mike Planty and this has been another episode of Just Science.

**Voiceover** [00:40:04] This episode concludes our case study season. As always, we appreciate your support and listenership. Don't forget to tune in to Just Science in 2021. Our next season will focus on opioids and other timely topics within the forensic community. Please keep an eye and ear out for our new season starting in January 2021. 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.