

## Just Identifying Decedents through Postmortem Prints

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

**Voiceover** [00:00:19] 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 two of our Applications of Forensic Science for Human Identification Season, Just Science sat down with Bryan Johnson, the Major Incident Program Manager in the Federal Bureau of Investigation's Latent Print Unit, to discuss how postmortem prints can be used to help identify unknown decedents. One of the cheapest, easiest and fastest methods of identifying individuals is through friction ridge prints. However, challenges can arise in cases where trauma or decomposition affect quality of a decedent's hands. Fortunately, there is a variety of techniques available that can facilitate the collection of high-quality postmortem prints if the hands still possess the necessary layers of skin. Listen along as Bryan discusses the advantages of postmortem printing, why identification is accomplished by latent print examiners, and how friction ridge skin is formed. This episode is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Some content in this podcast may be considered sensitive and may evoke emotional responses or may not be appropriate for younger audiences. Here's your host, Jaclynn McKay.

**Jaclynn McKay** [00:01:31] Hello and welcome to Just Science. I'm your host, Jaclynn McKay, with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. Today, we will be discussing how postmortem prints can be utilized to help identify unknown decedents. Here to guide us in our discussion is Bryan Johnson. Welcome, Bryan. Thank you for taking the time to talk with us today.

**Bryan Johnson** [00:01:52] Absolutely. Thank you for having me.

**Jaclynn McKay** [00:01:54] Can you tell us a little bit about your background and your current role?

**Bryan Johnson** [00:01:58] Yeah. So I'm the FBI's major incident program manager in the Latent Print Unit at the FBI Laboratory in Quantico. I've been doing that for the last about 14 years with the FBI. And I originally started, I went to school in Honolulu, Hawaii, and at Chaminade University of Honolulu, and started as a forensic science major, not knowing exactly where I was going to land and kind of worked my way through starting in death investigation and wanting to do crime scenes and I got lucky and landed a honors internship with the FBI. So I went on that track and became a latent print examiner with the FBI. I did casework for about seven and a half, eight years, and then I took over the FBI's disaster victim identification squads at that point, and I've been running that since 2015.

**Jaclynn McKay** [00:02:43] Can you tell our listeners a little bit about the role and the importance of postmortem printing within human identification?

**Bryan Johnson** [00:02:50] Yeah, so postponing printing refers to identifying deceased persons using their fingerprints, traditionally. Sometimes also their palm prints or their footprints. But it typically refers to identifying people who are unknown or may not be easily identifiable. And so it's one of the easiest and fastest ways to identify a decedent. A lot of people get fingerprinted throughout life, whether it's for a background check or a soccer

coach or a day care, or if they made some poor choices and maybe were arrested at some point in life, their fingerprints are taken. And it's one of the only things that is truly in a vast, searchable database, and databases really, but there are lots of databases that maintain fingerprints, and even as technology grows, there's even more places to find those fingerprints. And so when we're trying to identify somebody scientifically, which is the proper way to identify a decedent forensically, you're really looking at fingerprints or dental exams or DNA. And dental and DNA, you kind of have to know who you're looking for to do that comparison. There is a DNA database, but most people aren't in it and for dental, you literally have to go to that person's dentist and request their records. So fingerprints are just such an easy and clean way to make a forensic ID that can be completely unknown. You can search it through these giant databases and come up with an answer as to who the person is and give that family some closure.

**Jaclynn McKay** [00:04:13] Bryan, could you describe for our audience what the FBI disaster victim identification squad is and how postmortem printing comes into play with mass fatality response?

**Bryan Johnson** [00:04:25] Yeah. So as I stated in my background, in 2015 I took over coordinating the FBI's disaster victim identification squad. And that's primarily a subset of latent print examiners, but it can include DNA and anthropology folks as well. And we're basically a team that can deploy around the world. And what we do is we go in and assist medical examiners and coroners when, frankly, they're overwhelmed. There's no such thing as a recipe for a disaster when it comes to mass fatalities. There's no number of fatalities. There's no specific location. Any time the local jurisdiction is overwhelmed, we have the ability for free to deploy and help them. And there's a couple different agencies like DMORT, which is their DHHS or some of the more local ones like FEMORS, which is the Florida version. But we essentially provide those identification services. And unlike maybe working on a single decedent, what ends up happening is we basically take all of the decedents into more of an assembly line processing, and we take each one through the different stages of identification, starting with intake and photography and fingerprints and dental and DNA and any kind of triage that we do along the way and then ending with autopsy. And that both helps with the flow to make sure that those victims are all processed quickly and efficiently, but that all the scientific matters that need to be handled are handled as well. And so one of the things we do is we also tie in with Interpol. So I'm one of the two representatives for Interpol for the Disaster Victim Identification Group. So we work international events like the Ethiopia plane crash or the MH17 plane that was shot down over the Ukraine and just as much as we would maybe something local like the Surfside building collapse that happened this past couple of years ago and or, you know, all the way up to something like 911. So it can be a bus crash, something small, but what we do is we basically take all the techniques that we have and basically put them into play at once. Because when you have a mass fatality scene, something unfortunate like a shooting, you may not have a lot of trauma. So printing may be pretty easy, but if it's a crash of any kind or a large fire, then you have lots of different kinds of trauma. You have fragmentation, you have burning, you may have maceration from the firefighters attempts to put it out and decomposition, depending on how long it takes to recover the bodies. So when you get to that realm, you literally have to have all of the different postmortem techniques to be able to identify those decedents. And that's really what we're bringing to the table is a ton of supplies, a ton of really eager folks who just want to help. And we help the local jurisdiction and then we just go back to our day jobs. And so it's a really humbling and empowering thing to be a part of, to be a part of that team and that force multiplier for whoever needs it when they need it, so they don't feel like they're supposed to do it themselves and maybe don't have the capabilities or resources to do it properly.

**Jaclynn McKay** [00:07:22] Can you talk a little bit about why latent print examiners are working with postmortem prints as opposed to tenprint examiners that are used to identify living persons?

**Bryan Johnson** [00:07:32] Yeah. So like I said, I'm a latent print examiner by trade. I'm at the FBI laboratory, and we traditionally do latent print casework where we receive evidence, we process it for latent prints, we find those chance and fragmentary small prints that are left behind on evidence that usually require some kind of chemical or visual light processing to enhance, and then we compare those to known records to try and identify people on the evidence. When a person is fingerprinted on purpose, you take a fully rolled fingerprint card. All ten fingers from nail to nail, as much information as you can and then you compare that to another fingerprint card with those same ten fully rolled fingers. And that can be easily 1500 to 2000 pieces of information that are easy, and a computer can do. It's called lights out ID and you can get that lights out identification because there's so much information there. Latent prints may only have seven, eight, nine pieces of information in them. They're often distorted, they're degraded, they're smeared, and so they require a different kind of training and different science algorithms really to make the matches in the system for a human to then make the final ID. When you're talking about postmortem prints in general, postmortem printing of a person who died maybe recently or of natural causes is really no different than a tenprint, and a tenprint examiner can make that identification. But once you introduce things like trauma or decomposition or anything like that, where it's going to affect the quality of the hands, those prints oftentimes more mirror a latent print rather than a tenprint. And so there may only be one fingerprint that was obtainable from the decedent. There may only be one partial print, there for that decedent. And so the tenprint algorithm and the tenprint examiners are designed for tenprints versus tenprints. That's why it's called tenprint. The latent print is used to looking at tiny pieces of single fingers and trying to find them in the vast databases of fingerprints. It doesn't have to be done by a latent print examiner, but it much more mirrors latent prints and so that technology is much more available and much more accurate when a latent print search is used for those purposes.

**Jaclynn McKay** [00:09:40] I think that's a very valuable distinction to understand. With unidentified remains, the decedents bodies can be in various stages of decomposition, as you've already spoken about with the various trauma. How often are you able to obtain high quality postmortem prints from decedents?

**Bryan Johnson** [00:09:59] Yeah, so my rule of thumb is if there's still skin on the hands, if the skin is still present, you can probably get a fingerprint off of it. Now, when we're talking about high quality prints, that's a bit different. When a person dies and their body, you know, biology sets in. One of two things kind of happens. If the body is in a wet environment or water, the body macerates and turns into wet decomposition. Maybe the hands and the skin start sliding or sloughing off and it gets difficult pretty quickly. The alternative is if there's no moisture and a lot of heat, then it would do what we call mummification, and that's where it hardens. And the outer layer may still degrade, but mummification is the alternative, of course, to maceration. And that doesn't account for anything like predation from critters or animals or the things that happen in nature, right? But the body is this super cool thing because it has these different layers of skin and each one can stand up and is pretty resilient for a very long time. So I've been working recently on a plane crash recovery from Alaska and we are identifying persons 70 years postmortem. So 70 years after they died, we're still able to get usable fingerprints and make those identifications. It really comes down to how the body was preserved or not.

But if there's still skin on the hand, you can usually get a print. The quality, of course, varies.

**Jaclynn McKay** [00:11:15] So, along those same lines, are there any variables that would come into play to affect whether postmortem prints are no longer a viable option for identification?

**Bryan Johnson** [00:11:28] Yeah, I mean, I think it does come down to the skin being present, of course. You can't get fingerprints if the skin isn't there. I'm pretty good and my folks that work with me are really good. But if the hand is skeletonized, there's not much you can do to bring that back. But essentially there's the three layers of skin. You have the outer epidermis, which is that outer layer of skin that if you look at your hand right now, that's what you're looking at is the epidermis. And that goes away pretty quick regardless of how you would decompose. But that under layer, that dermis, it really lasts a long time. So the things that are going to affect the ability to do it are going to be things like fire or long term wet decomposition where the skin would deteriorate and disappear very quickly. And then there's also the predation factor, because it's the longest point of the body. A lot of times that's where animals and things that may come across a body that is in the elements would start working on it. And so you can lose the hands and the feet fairly fast. But honestly, if the hands are still there, it may not be easy. It may not just be a matter of quickly printing it or putting it on a computerized live scan machine where you scan the fingerprints. That's not likely going to happen. But with the right techniques, you can absolutely still get fingerprints.

**Jaclynn McKay** [00:12:39] Bryan, you've already spoke about how postmortem prints may be used as opposed to other identification methods such as DNA and dental records, but what about some of the newer emerging technology?

**Bryan Johnson** [00:12:50] Yeah, so we've seen a lot of amazing success in the new frontier that is forensic genealogy and some of the new DNA technologies that are coming out of there. Rapid DNA has really come to the forefront of something that makes a lot of sense. If you have a DNA sample previously, it could be months or even years to get some of those samples processed and it's incredibly expensive. And with the advent of rapid DNA, a familial member can show up to a facility and say, I think that's my loved one. They can provide a DNA sample and you can compare it to the body. And so it's still not extremely cheap, but it definitely has a kind of a new wave into what it brings to the table. But in the current technology, it really still has a lot of limitations. It does not do well when the decomposition is affecting the sample or in, unfortunately, if there are comingled samples or more than one decedent, say maybe a car crash or something larger like the Miami building crash. Once you get to co-mingling, it's a lot more difficult for those quick machines to help. And the forensic genealogy stuff is fantastic. It just is - it's a huge scope and very costly still and it narrows it down to a list of possible people, but you're still limited to the folks that are submitting their DNA as reference samples essentially into those databases to make them work. So there is no right answer on how to identify a decedent. You know, in any mass fatality I've been in, we've needed dental, we've needed DNA, and we've needed fingerprints to make all the things. Sometimes you can identify somebody through fingerprints, and that becomes the DNA sample for other fragments that may be from that same incident. So it's really what I like to call a team sport, unfortunately, to bring all those sciences together. But the prints are the quick and easy way because we have such vast databases of people who voluntarily give their prints, or sometimes involuntarily, that we can use to identify them. It really does still work as that fast, cheap and easy way to do it.

**Jaclynn McKay** [00:14:47] I think that's such a valuable point and essentially what we're trying to get across with this entire human identification season of the podcast. So we spoke a little bit about the value, as well as some limitations to using postmortem prints for identifications, but let's switch gears a little bit and talk about actual techniques for how to obtain these prints. What are some of the current validated methods for helping develop and collect fingerprints from decedents?

**Bryan Johnson** [00:15:18] So the traditional way of obtaining fingerprints since fingerprints have been used really was using ink and paper. And that's just simply a thin layer of ink where the finger is rolled through that ink and then it is rolled again on a piece of paper. And I will say this still stands true for living individuals and for recently deceased individuals. But once any kind of decomposition sets in, regardless of which way it's going, that method really does not provide good quality record. And in fact, just using that methodology can make it so that the person doesn't get ID'd through fingerprints when they probably should have. One of the more used and much more efficient ways to do it is actually using fingerprint powder. Just black fingerprint powder, a little bit of layer on the skin and then using an adhesive lifter. There's commercially available ones. There's, you know, address labels. There's lots of different versions. You can use pretty much any kind of sticker. But essentially what it's doing is it's taking that more decomposition ridden finger and it's using that sticker to lift the fingerprint ridges back up and get that really clean, high-quality print. And so I equate that more to like the ink and paper being fax machine quality and that powder and sticker method being like a digital scan of what it would be. And so you just get a much better method. So just from a collection standpoint, just switching to that method, maybe not in every case can greatly increase your fingerprint quality and your chances of identification. Past that point there are lots of different methods for what we call rehydration. With all postmortem printing the first thing you do is examine and clean the hands and then you would rehydrate and recondition in some way and then you would attempt to print them. So maybe just injecting saline into the fingertips to try and give them that three dimensionality back or doing some soaking things like that. But those methods are really all that we're trying to do is make it so that the decedent's hands look as close as they did before they died so that it can match the record. Because the records are matching to are their living records. And if their hands have deflated or decomposed, that record is going to have a harder time matching to it. So everything we're doing, all these different techniques, are mostly just to rehydrate the hands and make them look as close to the living hands as they could have been.

**Jaclynn McKay** [00:17:28] So in cases where bodies have been mummified or have been burned, are there any other techniques that can be utilized to help restore the prints or the hands to the original shape and size?

**Bryan Johnson** [00:17:41] Yeah. So once you start getting into those much more difficult cases, you're past the point of which you can just use the traditional printing. Most of the time, if someone's been burned or someone has been mummified or is incredibly macerated, it's a very wet decomposition, you cannot just print that body. You have to do something to it to make it usable. And one of the most underutilized and best methods for rehydrating hands is actually boiling. A simple hot pot with boiling water in it and 15 second intervals and it will rehydrate that hand and take a completely deflated, macerated, wet hand and make it look like the person died in the last couple of days. And what it's doing is really rehydrating the skin cells. So it's reverse osmosis. It's actually osmosis for once and it's actually putting that water back into the skin and rehydrating it back up. And once you've done that, you can use that powder and sticker technique and get fantastic

prints. In the Thai tsunami, they only had a couple of percent hit rate originally until they started working because all of the remains were macerated. They were all - had been in water for a very long time. And just simply that 15 seconds, 30 seconds in boiling water, they're just dipping the whole hand in there, greatly increase the yield of prints and the ability to identify them. So wet bodies pretty much need to be - the hands need to be boiled in order to print them and then you still have to use that powder and sticker because you're usually at dermis at that point, that under layer of skin. When it comes to mummified remains, though, boiling really won't do you any good. I mean, eventually I suppose it would break it down, but probably not in a good way. Mummified requires getting into the science a little bit. And so that one, there's a technique with ammonium hydroxide and sodium bicarbonate where you can rehydrate the hands and it will actually rehydrate that tissue and make it pliable again, so the fingers bend and bring that that tissue back to being the standard texture of skin. There's another hydroxide, sodium hydroxide, that works really well. It just is a little more complicated because if you don't remember what you're doing, it will dissolve the hand. And that's not exactly the end goal with fingerprinting. And then finally burn remains. The skin is actually usually coated on the outside with charred remains and it's in bad shape. But if you actually remove that skin and cleanly turn it inside out, like I said, that - the human body is so cool. Your prints are on the outside, your prints are on the inside of the top layer of skin, and your prints are on that lower dermis layer. So you have three chances to print every single finger. And typically, with fire remains, you can break off and twist off that outer layer of skin, turn it inside out and either photograph or print that inside layer of skin and still get a forensic ID using fingerprints in a matter of minutes. So it's not something that most people necessarily do. A lot of people see a very macerated body or a or a mummified or burned body, and they immediately tag it as unprintable. And I mean, that's sad. It usually is a lack of training, which is part of my - what I'm trying to help, you know, the medical examiner, coroner community, just because they have so little training in this. But these techniques are not difficult once you learn them, and they really can yield an enormous amount of identifications that wouldn't have previously.

**Jaclynn McKay** [00:20:50] You spoke a little bit about how you have essentially three chances to try to capture fingerprints. Can you maybe speak a little bit more to how fingerprints are formed and the different layers of skin and what all makes up human fingerprints?

**Bryan Johnson** [00:21:07] Yeah. So the fingerprints are actually developed before you're born. Six to eight weeks gestation and they develop throughout your development as an infant and they stay permanent throughout your life. Now permanent is what we rely on and they're unique because of the different environments that you are in the womb. So the diet of the mother, if the baby is sucking on their fingers or pushing on the outside, kicking, that thing, the mother's oil, the baby's kicking, things like that, all those things will affect your fingerprints. And so that's why even identical twins don't have the same fingerprints because they don't have the exact same activities, diets and everything else, whereas they would have the same DNA. And so when that development happens, what they're called bowler pads, that squishy pad on the tip of your finger, as that develops and those things change, your fingerprints become unique and they're basically made up of three different layers; the fatty layer underneath, that dermis layer, and then the epidermis layer on the outside, which is a bunch of tiny little layers. But the epidermis sticks together, and the dermis is there pretty much permanently, and that's the last one to go. And so when you looking at from a post mortem standpoint, as the body decomposes, that outer layer, the epidermis is pretty quick to jump ship. It will slough off, what we call sloughing, it'll slide off and kind of de-glove and it basically looks like a whole glove of skin coming off. But that's

okay. That's actually helpful. The skin can be put onto a gloved hand of a practitioner to give it its structure back and you can print that. That dermis is really interesting as well because it is essentially the three-dimensional structure that gives the epidermis its ridges. So the ridges and furrows of a fingerprint are the raised and lowered portions. And that dermis is a set of what they call papillae pegs. They're a set of two rows for every ridge, and it's basically like little, tiny pegs that hold up the ridges. And so when you're looking at that dermis, it kind of looks fuzzy almost. It's a little bit different to compare. You have to get used to it because it's two lines where everywhere there was one previously. But they stick around for a very long time and a little hot water, and they come right back to get printed. It's really very interesting how the body is built and how well it integrates with itself.

**Jaclynn McKay** [00:23:17] It's really interesting learning about essentially how resilient fingerprints are. As you spoke, a lot of these techniques that you've talked about are valuable to the medicolegal death investigation community and even crime scene investigators on scene. I know when I was one, we had to take major case prints for all of our decedents. If they wanted to learn more and maybe even see how these techniques are performed, are there any resources available to the community for that?

**Bryan Johnson** [00:23:48] Yeah. So during the pandemic, unfortunately we had a little more time on our hands, so we created a video series. There's a series of short little seven to 15-minute videos that are free and available to all, and they're on the FBI bio specs website. We'll put a link to that in the show notes, I think. But that was kind of a thing we were trying to produce because as much as I would love to, I go around and teach with my colleagues as much as we can for medical examiners and coroners, but there's a lot of them. There's 2600 medicolegal death investigation systems in the US and there's only a few of us. So that didn't work. So we created the video series to try and bridge that gap. And the other issue is that a lot of people aren't the same folks in every office that are doing it. Sometimes it's the autopsy technician, sometimes it's the crime scene investigator, sometimes it's the pathologist all in one kit. So it just depends on what office it is and what they're doing. But we wanted to provide that in a resource we thought would be both current and helpful. There are also standards written in this. So for the AAFS American Standards Board and the Organizational Scientific Area Committee, the OSAC, which is through NIST. Both of those have documents published and on the registry in postmortem printing. And so those are really good, not so much, I mean, to learn, yes. But really, if you want to learn about them or to make your office more capable of doing these things and you're looking for standard operating procedures, they're written as best practice recommendations so that you would be able to integrate it into your office. So there are free literary sources, there's free videos, and all of those are available for anyone to learn. And we're pretty friendly at the FBI. So I actually take a lot of calls and emails every single day of people who just have case questions and we make ourselves available for that, for the medical examiner coroner community, because we want to make sure they have the tools they need to do their job for whatever case they encounter.

**Jaclynn McKay** [00:25:41] I think that's very valuable to the field and I know people will be grateful that all of that exists, especially the training tools as well as the best practices and standards. So we spoke a little bit about the importance of and the value of postmortem printing and techniques. But once we have developed the postmortem prints from the decedents, can you talk a little bit about what is actually done next and what are the next steps in the process to actually identify the individuals?

**Bryan Johnson** [00:26:13] Yeah. So once postmortem prints are taken, they don't magically identify themselves as much as we would like that. Typically, you're going to

have to either compare it to an unknown database such as an AFIS or an automated fingerprint identification system, or to a record of somebody who they think it is. So a lot of times when somebody is deceased, there's what we call a tentative identification where they think they know who it might be. Either they had a license on them, or it was in their own home or their car. But sometimes, literally, we have no idea who the person is and no leads to go on. So once those prints are taken, they're submitted to the various different databases. And the unfortunate part of the various databases is that there are various databases. There are three main federal databases. That's the DOD, which is mostly foreign persons. DHS, which is one of my favorite databases, even though I work for the FBI, because every single person that comes in the U.S. who is not a U.S. citizen gets fingerprinted on the port of entry. So anybody just coming to visit or going on vacation or anything gets fingerprinted. And we've been able to help a lot of foreign events with fingerprints that their own country didn't have on them because of that. And then, of course, there's the FBI's next generation ID database, and that's what used to be called IAFIS, if people were around then. But that database is of all the criminal and civil prints in the U.S. for American civilians. In addition to that, each state has their own database. In addition to that, a lot of the different states, five of them specifically, have driver's license databases where if we know who it is, we can retrieve those prints. We can't search it, but we can retrieve those prints. And then there's prints available in like schools for kids who get printed for school reasons. There's employer prints. There's lots of places these prints are. And so the step one is basically get the prints from the from the decedent. Step two is to search it through all available databases. So that usually, if it's done properly, would be the medical examiner searching the state and local records first. And if they get a hit, then that's great. And if they don't, they would send it to the federal databases, that's us. And they would search against the FBI's database. We can search with and help with searching DHS's database, and we'll do all of that. And then we you know, even if we don't identify them, we still retain them because we don't know when something that's been sitting in a filing cabinet for years finally gets digitized might solve an unknown deceased case. So we never just search it once and give up on it. But there are so many databases out there that it's hard to hit them all. There's no one magic button that just searches all the databases, which is somewhat unfortunate, makes my job a little more difficult. But yeah, either a tentative record that we can identify it to. So if they think we know, we can look for that record specifically and manually compare it or that blind search. And we have extremely good success in that because people get printed for so many different reasons. So those prints really get searched against databases and then the identifications are made and that allows the medical examiner coroner to then try and find next of kin, issue a death certificate and all the things they legally need to do as part of their case.

**Jaclynn McKay** [00:29:18] So with looking forward into the future, are there any other techniques or standards that you think need to be researched more or looked into? Or do you have any thoughts about where the future of postmortem printing might go?

**Bryan Johnson** [00:29:34] Yeah, so I'm a big proponent of technology. I have worked on a number of projects in getting fingerprint scanners that are capable of printing postmortem individuals. The biggest thing that for all decedents is quick identification. No one wants to wait months or years for an identification. That's not fair to the families and it's not fair to the person that died. It's one of the biggest things we're looking into and we want more of and better of is digital fingerprint scanners. All fingerprint scanners in the market right now are made for living individuals. In fact, some of them have some anti spoofing technologies in there, so they actually look for a pulse or heart rate or they're ultrasonic and have some technology in there. So we have to try and trick them to still work, even though the person's not alive because we need it for that. And one of the other



things that I think is on the, you know, kind of the forefront of maybe what's going to come but isn't there yet is contactless fingerprinting. There's a number of technologies out there that have cell phones or camera-based technologies where they can just put a fingerprint or put a finger under a camera, and it can automatically capture it. And while this is useful for a number of reasons in the postmortem world, very rarely are the hands clean and dry and ready to be printed. A lot of times there's moisture, there's condensation, there's things of that nature provided that is not conducive to printing. So that contactless realm, if we could ever get that to the point where it really could quickly just hover a camera over a hand and it would just grab those fingerprints and run them, that would be fantastic. And then the other piece that I think is really, you know, something that a lot of people are just dealing with the infrastructure in, is mobile identification. I mean, how cool would it be for every crime scene investigator out there to have a mobile fingerprint scanner attached to their phone and be able to print every body when they go to a scene, so before they even get the person in the truck to head back to the morgue, they already know who they are scientifically. I mean, that would be such a valuable tool, and some do have that. Some people are working on that, but it's fairly costly and there's a lot of logistics involved and there's a lot of infrastructure for the different databases to automatically talk. So there's a long way to go in that technology front. But anything that can speed up the identifications and the accuracy of capture without having to do all these exhaustive rehydrations really would advance the world of postmortem fingerprints and just take it up a notch.

**Jaclynn McKay** [00:31:55] Having something like that when I was a crime scene investigator would have made my life so much easier. So I have a lot of hope in the future technology for this field. Before we wrap up the episode, do you have any final thoughts that you would like to leave our listeners with.

**Bryan Johnson** [00:32:11] If anybody's in this field already, just make sure you understand that there are so many ways to postmortem print a decedent and so many tools and techniques out there that maybe aren't known that if this sparked your interest at all or if you have, you know, all of a sudden you just became super passionate to do this, I just want people to know that it's something you can do. Like, you do not need a medical degree to do postmortem printing. You just have to want to do it and it's it can sometimes be a long, intensive, sweaty, gross process. But, you know, I really want people to feel like they have the ability to do it. So I just want everybody to feel empowered and educated and hope that we can get the best out of this to have the least amount of John and Jane Does out there. Because like I said, no one deserves that. I don't care what their circumstances were that led to their death. But no one deserves that. And the more families we can give closure to that, the more cases and resources we can use for things that need them, the better off everyone is.

**Jaclynn McKay** [00:33:06] Thank you so much, Bryan. I think that's a very poignant point to end on. We appreciate your time and your insight.

**Bryan Johnson** [00:33:13] Thank you for having me today. It's been great and I hope people enjoy this.

**Jaclynn McKay** [00:33:16] If you enjoyed today's episode, be sure to like and follow Just Science on your platform of choice. For more information on today's topic and resources in the forensics field, visit [ForensicCOE.org](http://ForensicCOE.org). I'm Jaclynn McKay and this has been another episode of Just Science.

**Voiceover** [00:33:35] Next week, Just Science sits down with Lori Bruski and Amy Jenkinson to discuss the application of databases to human identification. 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.