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THE
CRIMESCENE
NEWSLETTER OF THE LAKE COUNTY CRIME LABORATORY

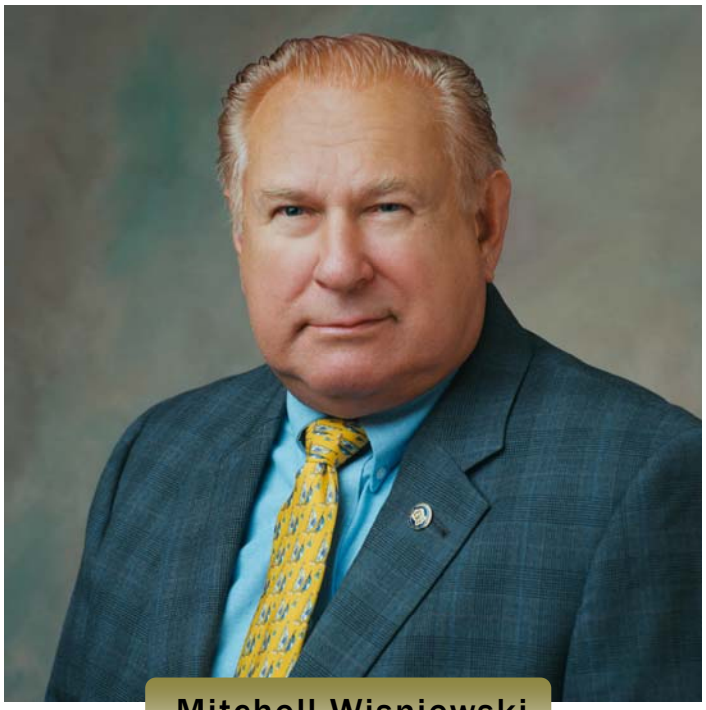
Mitchell Wisniewski: Leaving His Print

BY ROBERT SBERNA

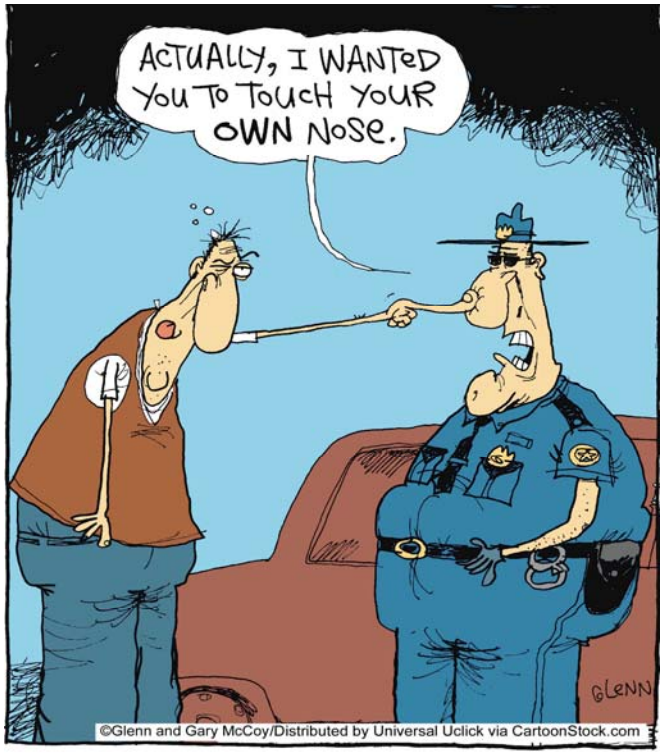
Over the course of his four-decade career in forensic science, Mitch Wisniewski has had a ringside seat to technological advances that were probably unimaginable when he first entered the field.

Wisniewski, an adjunct fingerprint and firearms examiner with the Lake County Crime Laboratory, began his forensic career in 1977 with the Cleveland Police Scientific Investigation Unit.

The tools he used back then to process crime scenes seem like antiques compared to the flashy technology showcased on "CSI" and similar TV shows. With high-resolution digital cameras and 3D crime scene reconstruction software still a couple of decades away, Wisniewski photographed crime scenes in the 1970s with a bulky camera and black-and-white film. He developed latent (hidden) fingerprints through the century-old process of dusting with powder. Nowadays, in addition to powder, fingerprint (CONTINUED ON PAGE 3)



Mitchell Wisniewski



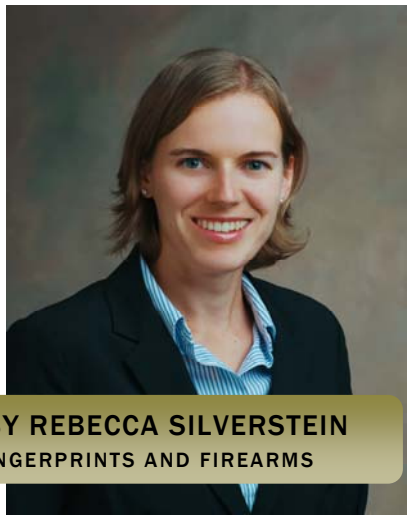
Hendrix: Backpack Lead to Conviction

BY ROBERT SBERNA

When two-year-old Hannah was admitted to Cleveland's Rainbow Babies and Children's Hospital for treatment of acute lead poisoning in July 2009, doctors were baffled. They couldn't identify the source of Hannah's lead exposure. Her family's house in Mentor and their previous residence didn't appear to have lead problems, and Hannah's preexisting medical issues made it unlikely that she could have exposed herself to any lead-tainted items. Hannah was a special needs child, afflicted with a rare set of birth defects known as CHARGE Syndrome, which left her with multiple disabilities, including deafness and limited mobility. In addition, Hannah didn't eat by mouth: She received all of her meals through a feeding tube. (CONTINUED ON PAGE 5)

Frequently Asked Questions

This Column Answers Questions Commonly Asked of our Scientists



ANSWERED BY REBECCA SILVERSTEIN
EXPERT IN FINGERPRINTS AND FIREARMS

Q: What are the best surfaces to retrieve fingerprints?

A: Like many things in science, it depends because there are so many variables. Many factors go into determining if a surface of an object will be good for developing latent prints. Each situation is case by case dependent.

A latent print is an invisible impression of the ridged skin on the surfaces of your fingers, palms, feet and toes. These impressions are made up of sweat, oils, and/or any other contaminant that may be present on the surface of skin. Any surface that has been touched or handled has the potential to retain a latent print. An object's surface will fall into one of two categories: porous or non-porous.

Porous objects are absorbent and include items such as papers, cardboard, untreated wood, and other similar materials. When a latent print is deposited on one of these surfaces it is absorbed into the material, causing the print to become more durable. Porous items such as paper, envelopes, and boxes are good surfaces to process for latent prints. Chemical reagents that react with the different constituents of the residues on the latent print are utilized for evidence processing of porous items.

Ninhydrin is the most commonly used reagent for porous items. This chemical reacts with amino acids that are present in any sweat residues, causing a purple color change. Physical Developer reacts with lipids, oils, fats, and waxes present in the residues causing a black/gray color change. This chemical is used in concert with Ninhydrin to develop additional latent impressions that may not have reacted with the Ninhydrin.

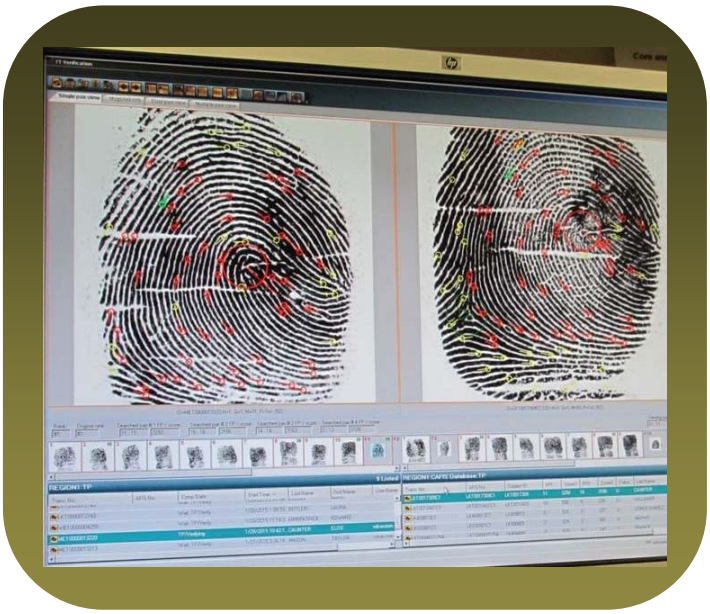
Nonporous objects do not absorb latent prints, typically repel water and have a finished surface. Plastic, metal, glass, painted wood, plates and rubber are a few examples of items that are nonporous. Since the print is not absorbed into the material, it has the potential to be damaged.

To protect and preserve a latent print on a nonporous surface, a technique involving superglue (Cyanoacrylate ester) fuming is employed. The fumes react with any residues from a latent print that are present, creating a polymer which affixes the print to the surface. This allows for the application of additional processing techniques, including fingerprint powders and dye stains (visualized with an alternate light source).

The surface of the object is not the only factor to take into consideration. Textured surfaces can be both porous and nonporous. These objects present the problem of fragmented impressions due to incomplete contact of the friction ridge skin and the textured surface. The condition of the surface is also taken into account. Residues such as rust, dirt, sticky/oily substances can prevent the deposit of latent prints. Finally, environmental conditions such as heat, humidity, cold, rain and/or snow can affect the deposition of latent prints. These conditions are considered during processing because different techniques can be applied.

If there is any question regarding whether an object is suitable to be submitted for fingerprinting, it is always best to submit the object and allow the analysts to determine its value.

For questions, please contact Rebecca Silverstein at 440-350-2793 or rsilverstein@lakecountyohio.gov.



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HIGHLIGHTS

- International Association for Identification (I.A.I)– Ohio Regional Representative
- I.A.I- Certified Senior Crime Scene Analyst
- Ohio Identification Officers Association– *Past President (1991); Board of Directors; Crime Scene Certification Chairman; Distinguished Membership (2012)*
- Canadian Identification Society, LIFE Member

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examiners can use a wide range of sophisticated techniques to lift latent prints.

In years past, suspects' fingerprints were collected by rolling their fingers through ink and onto 8-by-8-inch cards. Fingerprints—and palm prints—can now be electronically scanned and transmitted to a central database in a matter of seconds.

Wisniewski joined the Lake County Crime Laboratory in 1993, the same year the agency began using the FBI's Automated Fingerprint Identification System (AFIS). Prior to the advent of the AFIS national database, investigators identified likely suspects by manually pulling the fingerprint cards of previously arrested individuals and matching them to crime scene prints.

"I used a magnifying glass to compare the fingerprint cards with the prints from the scene," recalled Wisniewski. "If there wasn't a matching fingerprint card on file, we were out of luck."

In 1993, DNA analysis was added to the Crime Laboratory's forensic capabilities. "DNA testing is probably one of the biggest advances that I've seen in forensic science," said Wisniewski. "Before DNA testing, scientists could only conduct blood and enzyme typing, which were not very discriminating."

Wisniewski performing a firearms comparison analysis.

There have also been some significant changes in the field of firearms, noted Wisniewski. As an example, he explained that Glock, which manufactures highly popular pistols for law enforcement, has changed its manufacturing process so that firearms examiners can more easily distinguish Glock guns from each other after a shooting.

In the past, after police-involved shootings in which several officers fired their guns, it was nearly impossible to identify which Glock weapon fired the fatal shot, said Wisniewski. As a result, Glock is now manufacturing their gun barrels with striations that will leave unique toolmarks on fired bullets. A toolmark is an impression, scrape or gouge caused by a tool such as a gun barrel or firing pin coming in contact with a softer object such as a bullet or shell casing.

"The distinctive toolmarks can then be analyzed by examiners to identify the gun that was used," Wisniewski said.

Not only have the technology and techniques of forensic science undergone significant change, but so has the training.

"Back when I started, we learned on the job from the more experienced people," Wisniewski said. "But those days are gone. Now you need a degree in chemistry or another science. College students can even major in forensic science. It's an altogether different ball game."

He added that although a degree is now a requirement for entry into the field and advanced training is available, mentoring from experienced analysts is still an important aspect of learning for new forensic scientists.

While the game may have changed, the role of a forensic scientist has always been the same: Wisniewski and his colleagues are responsible for collecting, preserving and analyzing evidence that can assist (CONTINUED ON PAGE 4)

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in convicting the guilty and exonerating the innocent. It's a role that still gratifies Wisniewski, even after many decades of service.

Wisniewski joined the Cleveland Police in 1969 after a four-year stint in the Air Force that included tours in Vietnam. After eight years as a patrol officer on Cleveland's East Side, Wisniewski was promoted to detective and assigned to the Scientific Investigation Unit (SIU).

"In SIU, I worked all of the high-profile murder and robbery crime scenes," he said. "I did everything—took photographs, dusted for fingerprints, collected trace evidence. I loved it."

During the mid- to late-1970s, Cleveland was afflicted with a rash of car bombings, which were orchestrated by organized crime, killing notorious crime figures such as Danny Greene and Alex "Shondor" Birns.

"There were a lot of bombs being planted back then," said Wisniewski. "Even the motorcycle gangs were blowing each other up."

Investigating bombings and disposing of unexploded ordinance were part of Wisniewski's duties.

"On a few occasions, we had to go into houses that contained old sticks of dynamite," he said. "Sometimes, the nitroglycerine would leach out of the dynamite onto the concrete basement floor or onto the beams of the house. We'd have to 'desensitize' the explosive with an acetone mixture and then carry it out of the house and dispose of it. There was always the chance that it could explode, so it could be very stressful."

After 24 years with the Cleveland Division of Police, Wisniewski was offered a position as a fingerprint and firearms examiner at the Lake County Crime Laboratory.

"They needed someone with fingerprint and firearm experience," he said. "So I retired from Cleveland and went to work for Lake County in 1993."

Reflecting on his career, Wisniewski said his most satisfying case involved the conviction of Michael Aquila, who murdered a young woman in her Willoughby apartment in 1995. While processing the crime scene, Wisniewski collected latent prints from the apartment window. He entered the prints into the Crime Laboratory's newly acquired AFIS system and got a hit for Aquila, whose prints had been uploaded to the database a year earlier after his arrest for carrying a gun. Confronted with the fingerprint match and other forensic evidence, Aquila confessed to aggravated murder.

"If we had not been able to match his fingerprints through AFIS, Aquila would have been long gone and he might have killed again," said Wisniewski.

Wisniewski utilizing an alternate light source to detect latent prints.

Wisniewski formally retired from the Lake County Crime Laboratory in 2012, but he still works on cases, technically reviewing fingerprint and firearm reports.

Residing in Aurora, Wisniewski and his wife have three sons. Their oldest son is a lieutenant colonel in the Army, their middle son is an intelligence analyst with the FBI, and their youngest son works in retail.

He pursues an active retirement that includes boating and jet skiing on Lake Erie with family and friends.

"I'm keeping busy these days," he said. "I enjoyed my job, but it was time to move on and let the younger people take over. It was great to see the improvements in forensic science during my career. I think the Crime Laboratory has become much more effective because of new technologies and better equipment and training. I think there is still a lot of growth opportunity in the field, particularly in DNA. When I talk to students who are interested in forensic science, I tell them that the jobs of the future will probably be in DNA analysis, rather than fingerprints or firearms. DNA holds a lot of potential."

However, while DNA is the most rapidly changing technology in forensic science, there will always be opportunities for fingerprint and firearms examiners, said Wisniewski, explaining, "We'll still need trained people to analyze latent prints and known prints to compare the various characteristics. We'll always need someone to say, 'This is a definite fingerprint match or this is not a match,' and then testify to that in court. You'll also need a set of trained eyes to look at shoeprints, tire tracks, and toolmark impressions from guns, screwdrivers and pry bars. Currently, there are no instruments or computers available that can make a positive fingerprint or toolmark identification. It still takes a forensic scientist to do that."

Hendrix: Backpack Lead to Conviction

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But the doctors' confusion turned to suspicion when Hannah's lead levels surged on several occasions after her mother, Erin, a former high school chemistry teacher, visited her in the hospital. Erin and her husband had recently moved to Mentor from Belmont County in east-central Ohio. Concerned for Hannah's safety, hospital administrators alerted a social worker at the Lake County Department of Jobs and Family Services (LCDJFS), who then contacted Mentor Police on July 24, 2009.

Within hours, Mentor police detectives, with assistance from the Lake County Prosecutor's Office and the Lake County Crime Laboratory, prepared a search warrant application for the Hendrix home. The next morning, they executed their warrant, looking specifically for any forms of lead, as well as baby food and feeding equipment. While searching a downstairs closet, they found a zip-lock baggie of white powder in a backpack owned by Erin.

Dave Green, a criminalist at the Crime Laboratory, analyzed the powder and determined it was lead nitrate, a water-soluble, highly toxic substance. Detectives learned that Erin, while employed as a chemistry teacher in Belmont County, had acquired lead nitrate in the past for class experiments. With investigators

Lead Nitrate found in the chemistry cabinet where Defendant was employed.

and healthcare providers fearing that Erin was poisoning her daughter, emergency custody of Hannah was granted to the LCDJFS on July 27, 2009—just three days after Mentor Police began their probe.

Hannah was now in the care of foster parents, but the investigation into Erin Hendrix's culpability would continue for the next year. In their efforts to develop the case, Mentor Police detectives Colleen Petro and Dan Radigan interviewed dozens of Erin and her husband's co-workers, relatives and friends, as well as toxicology experts, and the nurses, doctors, and social workers who had interacted with the couple.

The detectives learned that Hannah's lead poisoning had begun in early 2008 when she was five months old. The family was then living in Belmont County, where Erin taught at Bellaire High School. Hannah had been admitted to the Children's Hospital of Pittsburgh (CHP) after experiencing seizures (a symptom of lead poisoning). At the hospital, X-rays showed that Hannah's organs were glowing, which was also a sign of lead poisoning. Blood tests confirmed that Hannah's body contained a deadly concentration of lead. Neither Erin nor her husband offered an explanation as to why their daughter showed abnormally high levels of lead.

During their investigation, Petro and Radigan drove to Pittsburgh to interview CHP administrators about Hannah's case. They were told that Hannah underwent two weeks of in-hospital chelation treatments, a painful process of flushing lead from her organs and tissues. The treatments were successful in reducing Hannah's lead levels, but CHP toxicologist Dr. Anthony Pizon noticed that the levels rebounded after Hannah was sent home or she was visited in the hospital by her mother.

Petro and Radigan, along with several members of the Lake County Prosecutor's Office, also traveled to Belmont County several times to meet with Bellaire school officials and Belmont County Sheriff's investigators. They learned that the sheriff's department had been contacted in February 2008 by CHP representatives who were suspicious that Erin was mixing lead with Hannah's food supply. At that time, sheriff's investigators searched the Hendrix home and collected Hannah's medications. Two of the medications later tested positive for lead. The investigators also checked Erin's former classroom at Bellaire High School. There, they found 10 different forms of lead, including lead nitrate. And although Erin had left her teaching position when Hannah became ill, her key card was used to enter the high school several times while she was on leave. Two of those entries (CONTINUED ON PAGE 6)

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were on Saturdays in early 2008, around the time that Hannah's poisoning began.

The Belmont County Sheriff's investigation had stalled without a resolution, despite concerns by local social workers about Hannah's safety. In June 2009, 17 months after Hannah's unexplained lead poisoning was first reported, the Hendrix family moved to Mentor. At that time, Erin was pregnant with her second child.

At Rainbow Babies and Children's Hospital, where Hannah was treated soon after relocating to Mentor, her lead poisoning was quickly diagnosed by Dr. Lawrence Quang, a pediatric toxicologist, and Dr. Lolita McDavid, the hospital's medical director of child advocacy and protection. During a conference call arranged by Mentor detectives and the Lake County Prosecutor's Office, the doctors from Rainbow and CHP agreed that Erin was most likely responsible for the systematic and non-accidental poisoning of Hannah.

Mentor detective Colleen Petro said the resolution of the case was bittersweet.

"I'm glad that we were able to intervene in this awful circumstance and prevent further harm to Hannah, but she will experience lifelong problems from her lead poisoning," Petro said.

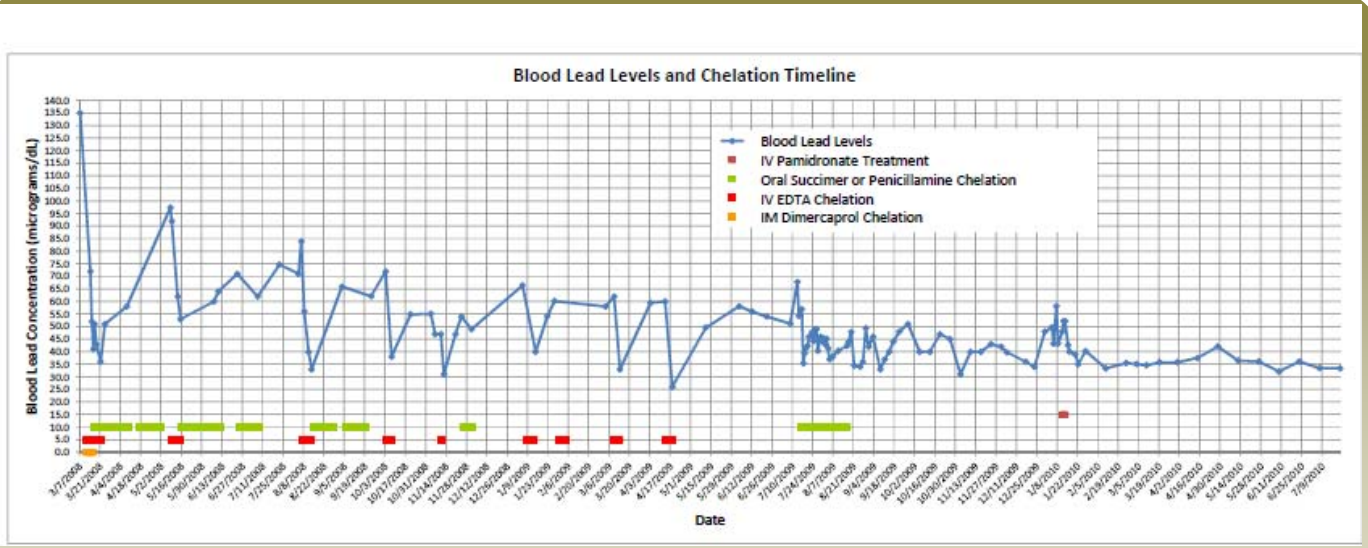
Although Hannah's health had greatly improved under the care of foster parents, doctors predict that she will have irreversible brain damage from the lead poisoning, estimating that she lost between 27 and 40 IQ points. Because lead is absorbed in the body's bones and tissues and then released slowly back into the bloodstream, Hannah will suffer life-long, debilitating damage from her mother's actions.

Assistant Prosecutor, Lisa Neroda, who prosecuted the case with Assistant Prosecutor Paul Kaplan, said the investigation and Erin's conviction was a prime example of teamwork by the Mentor Police, the Crime Laboratory, the Prosecutor's Office and the physicians who treated Hannah.

Neroda and her colleagues worked closely with Mentor detectives and Drs. Quang and Pizon to correlate Hannah's lead poisoning with the evidence that had been collected.

"We wanted to ensure that we would properly present our case," said Neroda. She noted that Dave Green was instrumental in helping to draft the language of the Hendrix search warrant, explaining that Green advised investigators as to what they should be looking for during their search for lead and lead-contaminated items. Green informed them that they were not necessarily looking for metal types of objects—they also needed to collect any powders, especially any that were not labeled. (CONTINUED ON NEXT PAGE)

Defendant's backpack containing Lead Nitrate.



Timeline depicting Hannah's blood lead levels.

"There were hundreds and hundreds of hours involved in this multi-agency effort," said Neroda. "There was a lot of concerted questioning and sorting of medical records in our effort to support this child. The public doesn't realize how exacting we are when it comes to making sure that our conclusions are backed by admissible evidence."

The major breakthrough in the case occurred during the search of the Hendrix residence when detectives found the backpack containing a bag of white powder. At the Crime Laboratory, Dave Green utilized Fourier Transform Infrared technology (FTIR) and X-Ray Fluorescence technology (XRF) to confirm that the powder was lead nitrate, the same substance that was used to poison Hannah.

Green spent two weeks exhaustively analyzing numerous items of evidence from the case, including bedding, clothing, feeding tubes, syringes, body lotion, toothbrushes, toothpaste, measuring cups, scissors, liquid prescription and non-prescription medications, and cans of baby formula. All solid-phase items were examined directly using XRF, while all other items required an extraction procedure prior to being tested. None of these items, however, were found to contain lead.

Kaplan credited Doug Rohde, the Crime Laboratory's Supervisor of Chemistry and Toxicology, with helping the prosecution team comprehend how lead affects the body.

"Rohde spent hours of his time assisting me in understanding and learning the complex chemistry behind lead poisoning," said Kaplan. "In order to effectively prepare Drs. Pizon and Quang to testify in this case, as well as to conduct my direct-examinations of scientists at the Center for Disease Control (CDC), I had to relearn almost a semester's worth of college organic chemistry. Rohde assisted me greatly in understanding things like lead isotope ratios, atomic weights, and how lead nitrate interacts with the human body. On one occasion, I recall Rohde showing up at our office with two very large brief cases full of chemistry textbooks, which resulted in a long evening for both of us. As a part of Rohde's 'crash course' in organic chemistry, we focused, in part, on zinc protoporphyrin rings, which are formed in the red blood cells of a person subjected to lead poisoning, and which eventually cause the corrupted blood cells to no longer be able to (CONTINUED ON PAGE 8)

After being found guilty of Complicity to Attempted Murder, Complicity to Contaminating a Substance for Human Consumption or Use, and several other counts, Hendrix was sentenced to serve a prison term of 15 years to life.

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carry oxygen throughout the body. I feel that informal teaching and learning experiences such as these are often an overlooked and undervalued advantage in having a local crime laboratory as a resource. I have learned a great deal in preparing cases with all of the scientists at our Lake County Crime Laboratory."

Neroda also credited Rohde with assisting her in understanding the lead testing results. "Rohde had previous experience performing lead and zinc protoporphyrin analyses, so he was instrumental in discussing the results of testing performed at University Hospitals," she explained. "He accompanied me there and reviewed the results with the laboratory technician who performed them. In addition, he contacted a colleague at Case Western Reserve University regarding specialized isotope testing, just in case the CDC could not assist us, which would have made it necessary to do the testing locally."

Petro, who has spent 22 years in law enforcement, said the good working relationship among the police, prosecutors, and forensic scientists involved in the Hendrix case helped to streamline and strengthen the investigative process.

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"We all had the same goal of protecting Hannah and securing a conviction," said Petro. "The Crime Laboratory's role was integral. They realized this was a priority situation and that their speedy assistance was crucial. This was an example of everyday good police work and everyday partnership with other agencies. In Lake County, this is the norm more than the exception."

Erin Hendrix was indicted Sept. 29, 2010 on 22 counts related to the attempted murder of Hannah. A jury found her guilty five months later and she was sentenced to life in prison with the possibility of parole after 15 years. Erin's husband was not charged with any wrongdoing. Thanks to the perseverance and dedication of Mentor detectives Petro and Radigan, Hannah is alive today and steadily improving.