



End Violence Against Women International
(EVAWI)

Role of DNA Evidence in Sexual Assault Investigations

Part 1: The ABC's of DNA Evidence

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September 2016

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Dr. Kimberly A. Lonsway has served as the Director of Research for EVAWI since 2004. Her research focuses on sexual violence and the criminal justice and community response system. She has written over 60 published articles, book chapters, technical reports, government reports, and commissioned documents – in addition to numerous training modules, bulletins, and other resources. She has volunteered for over fifteen years as a victim advocate and in 2012, she was awarded the first – ever Volunteer of the Decade Award from the Sexual Assault Recovery and Prevention (SARP) Center in San Luis Obispo, CA. She earned her PhD in the Department of Psychology at the University of Illinois, Urbana – Champaign.



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special agent with the Air Force Office of Special Investigations (AFOSI) and continues to serve in a reserve capacity. Her formal education includes a bachelor's degree in Physical Anthropology awarded from the University of Hawaii, and a master's degree in Forensic Sciences, with a concentration in crime scene investigation, from George Washington University.



This is the first in a series of training bulletins on DNA evidence, based on our 32-hour OnLine Training Institute module, [Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations](#). The module is co-authored with Dr. Patrick O'Donnell (Supervising Criminalist, San Diego Police Department), and Lauren Ware (Chief of the Forensics and Special Investigative Branch at the Federal Law Enforcement Training Center in Glynco, GA). The module is so full of useful information and tools that we want to give you a taste of what you will find in it. We also hope this encourages you to go to the OLTI and register for the entire module.

In this first training bulletin in the series, we explain some basic information about DNA and its role in a sexual assault investigation. In future installments, we will explain how CODIS works, what types of biological evidence are available beyond the sexual assault kit, how DNA can be used to help build a successful investigation, and what strategies can be used to improve laboratory service requests submitted by investigators. We will also provide you an opportunity to apply what you've learned, with two interactive scenarios you can work through with specific case facts and evidence.

So let's get started.

What is DNA?

DNA (deoxyribonucleic acid) is a molecule found in cells throughout the body that carries our genetic information. DNA can therefore be used to identify (or "fingerprint") a specific individual, and this can then be used to support a successful investigation and prosecution of a suspect, exclude a suspect, or exonerate an innocent person.

The power of DNA fingerprinting stems from two primary factors. First, there are a large number of genetic markers, because DNA testing identifies characteristics at many different locations on the DNA strand. There are also enormous variations from person to person within these regions, so DNA typing can link evidence to a specific individual with an astonishing level of statistical certainty (except in the case of identical twins).

What are Sources of DNA for Forensic Purposes?

During the course of a sexual assault investigation, DNA and other biological evidence can be collected during the forensic examination of a victim or suspect – or from other evidence, such as objects found at the crime scene(s). The following are the sources from which DNA evidence is most commonly recovered in sexual assault cases:

- **Semen** may be left by a male suspect, either in or on a victim's body (whether male or female), on clothing, or on other objects recovered from the crime scene. This is the most common source of DNA evidence in a sexual assault case.
- **Saliva** is the second most common source of DNA evidence, and it may be the result of kissing, licking, biting, or sucking, as well as oral copulation by either

party. Saliva can also be left on objects, such as cigarette butts, cups, soda cans, and partially eaten food found at crime scenes.

- **Blood** may also be significant in a sexual assault investigation, and again, it may be found on the body or clothing of the victim and/or the suspect, or on objects recovered from the crime scene. Blood can also be transferred from a menstruating female to a male or female, or it can be the result of injury, which may corroborate the nonconsensual nature of a sexual act.
- **Fingernail scrapings or swabbings, as well as swabbings of the fingers** can potentially be collected from the victim and/or suspect in a sexual assault case and may yield evidence in cases of forced digital penetration. This may be of particular interest when there is information that the suspect or victim scratched the other party, or if the fingers of either person entered the other party's mouth, nose, or eyes. DNA from a person's sweat may even be recovered by collecting fingernail scrapings or finger swabbings, if the technology is sensitive enough.
- **Urine and fecal material** contain cellular material from an individual that may be used to develop a full or partial DNA profile. The source of the DNA is in cells shed from the body during the process of urination or defecation, not in the urine or feces themselves.
- **Other types of biological evidence** include bodily fluids that are rich in cells, such as sweat or vaginal secretions. DNA can also be recovered from other bodily tissues and fluids (including mucus, ear wax, dandruff, etc.).

Although hair from the head and pubic area are still collected as part of the examination procedure in some jurisdictions, they are rarely analyzed in sexual assault cases because laboratory findings are often inconclusive and DNA is much more powerful.

What are the Timeframes for Evidence Collection?

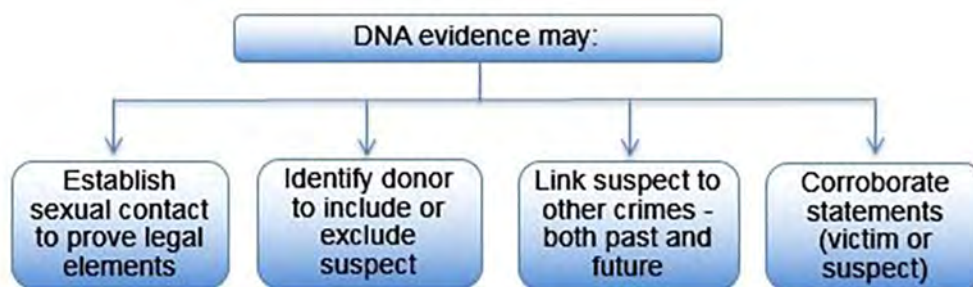
The forensic examination of a victim or suspect will only yield usable biological evidence for a certain period of time following a sexual assault. This is why many jurisdictions have timeframes for when they will conduct a medical forensic examination of the victim. These are usually in the range of 72–120 hours following a sexual assault.

Many communities follow the guideline of 120 hours (five days), which was recommended in the 2013 edition of the [National Protocol for Sexual Assault Medical Forensic Examinations](#). However, some jurisdictions are now extending that timeframe to 168 hours (seven days) or more, based on advances in DNA technology. In Illinois, for example, the seven-day guideline was established in [statewide regulations](#) designed to guide implementation of the Sexual Assault Survivors Emergency Treatment Act. A seven-day guideline is also currently being used in several cities in California.

As DNA technology continues to advance, this timeline may extend even further. However, it is always important to see these timeframes as guidelines rather than hard and fast rules, because medical forensic examinations may be of value beyond recommended timelines, for example if the victim complains of pain or has injuries.

What are the Primary Purposes of DNA Evidence?

Biological material may be used for a variety of purposes during the course of a sexual assault investigation. This is important to keep in mind, because the same evidence may be used for different purposes depending on the history of the assault and specific case facts.



Establish Sexual Contact

First, biological evidence may help to establish that a sexual act occurred. Establishing that sexual contact took place, or a particular sexual act was committed, may be critical not only for the investigation and prosecution of sexual assault, but also for sentencing purposes. However, it is crucial to note that the absence of biological evidence does not necessarily mean that a particular sexual act did not occur. There are many reasons why biological evidence may not be available in a sexual assault case, including the fact that no medical forensic examination was conducted, too much time elapsed between the assault and the medical forensic examination, or the suspect wore a condom.

Identify or Exclude a Suspect

If the suspect is unknown, a DNA profile may be developed from evidence collected during the course of the investigation, and then uploaded into the national DNA database known as CODIS (Combined DNA Index System). The DNA profile can then be compared with others in the database, in an effort to identify who the suspect is.

If the identity of the suspect (or suspects) is known, investigators can compare legally obtained DNA reference samples with DNA recovered during the investigation. This can potentially match the individual(s) with biological evidence associated with the assault.

This means that DNA reference standards should be collected from suspects whenever possible, and forensic profiles should be submitted to CODIS after the DNA from any consensual partner has been excluded. Of course, excluding suspects is another key use of DNA evidence, and it can also exonerate wrongfully convicted individuals.

Identify Prior Convictions or Arrests

If a suspect has prior convictions or arrests that are revealed by a CODIS hit, this information may be introduced during the prosecution of a sexual assault case. However, this is only true if the prior cases were substantially similar to the current one, demonstrating a pattern of past criminal behavior. Otherwise, this information may only be presented at the sentencing phase of the trial and not for a verdict.

Link Cases Based on Evidence

Another purpose of DNA evidence is to link cases with evidence submitted in any past cases – not just for sexual assault, but for any criminal offense included in the local, state, or national database. In Cleveland, for example, almost 4,000 evidence kits were tested between 2010 and 2015. As of September 2015, this process yielded 350 grand jury indictments and 100 convictions, many of which were for multiple sexual assaults. What has surprised officials most, however, has been the number of sexual assaults committed by serial perpetrators. This was reported in media coverage at the time:

One stunning finding that emerged from Cleveland's investigations is that as many as a third of reported rapes were perpetrated by a serial offender, a much higher proportion than officials anticipated. 'I've been in this business for 43 years and I thought I knew I something about it,' says [Timothy McGinty, the Cuyahoga County prosecutor] who guessed about 15% would be attributable to serial offenders. 'I was astonished' (Gourarie, 2015).

Recommendations for Best Practice

Unfortunately, many investigators and prosecutors only see DNA evidence as useful in stranger sexual assault cases, as a means of establishing or confirming the suspect's identity. This perspective fails to recognize the many purposes of DNA described here, especially in the majority of sexual assault cases where the victim and suspect know each other. Our recommendation is therefore to expand the use of DNA *regardless of whether the victim and suspect know each other – and even when the defense is likely to be consent.*

Another change is needed for investigators and prosecutors to stop viewing DNA as a means of confirming what they already know – and appreciate its value for advancing an investigation by producing leads and corroboration, as well as identifying and excluding suspects. All too often, DNA evidence is only tested when a case is headed to court – or when a suspect has already been identified and referred for prosecution. This

needs to change. The benefits of this approach were described by a Los Angeles detective, after that jurisdiction enacted a policy of testing all sexual assault kits:

Having the DNA from every rape kit I book has given me investigative leads I never would have expected. I take second looks at cases I would have dismissed, and I pass along more cases to the prosecutors. I used to think I didn't need DNA to develop a case, but it has helped me solve more cases (Human Rights Watch, 2009, p. 18).

Coming Soon

The next training bulletin in this series, *How CODIS Works*, will explain the types of profiles, identifying a CODIS “hit,” and the different levels of DNA databases.

For More Information

For more information, please register for our OnLine Training Institute module, [*Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations*](#). Launched in November 2015, this comprehensive module explores the complex role of DNA in a sexual assault investigation, including the alternative sources of DNA evidence and their potential significance or impact on a sexual assault investigation. A number of resources and tools are provided, along with a series of complex and interactive case examples. It is authored by Sgt. Joanne Archambault, Dr. Kim Lonsway, Dr. Patrick O'Donnell, and Special Agent Lauren Ware.

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Role of DNA Evidence in Sexual Assault Investigations

Part 2: How CODIS Works

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In [Training Bulletin # 1](#) in this series, we described the basics of DNA evidence. In this installment, we explain how the Combined DNA Index System (CODIS) works. We begin by describing how DNA profiles become part of the CODIS database, then explain how they are categorized and what happens when there is a "hit." We then explain the three levels of CODIS, so you can use this knowledge in your own work.

Introduction to CODIS

While the power of DNA analysis is remarkable, DNA profiles actually have limited utility in and of themselves. Their value rests primarily in the fact that they can be compared with other DNA profiles in databases such as CODIS.

Although not everyone realizes it, the CODIS database actually includes DNA profiles in two different categories, based on how they are collected. *Offender profiles* are developed from reference standards collected directly from known individuals, while *forensic profiles* are developed from biological evidence recovered from the victim, suspect(s), or crime scene.

Offender DNA Profiles

Most of the DNA profiles in CODIS are offender profiles, collected from individuals who are arrested or convicted for certain qualifying offenses. Biological evidence is collected from these individuals by drawing blood or using a buccal (mouth) swab. These samples are described as *reference standards*, and they are submitted to a forensic laboratory to develop a DNA profile. These profiles are also sometimes referred to as *known offender profiles* or *DNA database reference samples* (Nelson, Chase & DePalma, 2013). Offender profiles are then uploaded into the *Convicted Offender Index* or *Arrestee Index*, both of which are a part of the CODIS system.

Offender Index in CODIS

Each state has independent legislation that determines which offenders will have reference samples collected and analyzed, and which DNA profiles will be entered into the Offender Index in CODIS. While these laws have changed over the years, today all 50 states as well as the federal government have laws requiring the collection of DNA samples from individuals convicted of certain crimes. In fact, the federal government

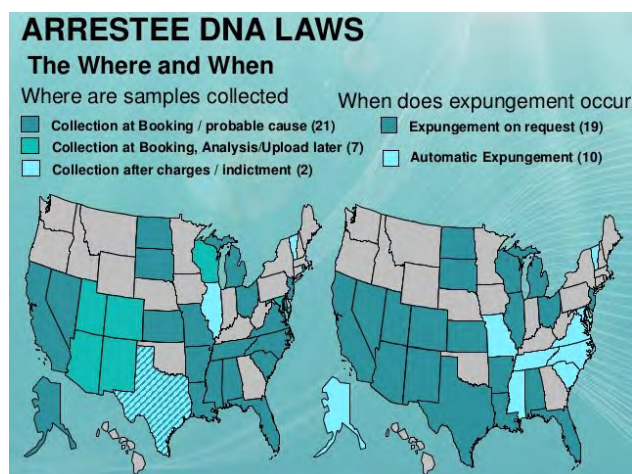
has come to view DNA collection as simply one more standard booking requirement, on par with taking a photograph and fingerprinting an individual at the point of arrest.

Some states have even authorized the collection of DNA samples from individuals who are convicted of certain *misdemeanors* (Hurst & Schellberg, 2013). Congress has also authorized the collection of DNA samples from anyone arrested, facing charges, or convicted of a federal offense – and to non-US residents detained under the authority of the United States.

Arrestee Index in CODIS

While there has been a trend with states expanding the collection of DNA from individuals convicted of any felony – and now certain misdemeanors – this trend has continued with states authorizing DNA samples to be collected at the point of *arrest*, rather than *conviction*. These profiles are entered into the Arrestee Index in CODIS.

As of December 2012, 28 states had passed legislation authorizing the collection of DNA from individuals at the point of arrest, for certain qualifying offenses. This map, drawn from a presentation by Lisa Hurst of Thomas Gordon Honeywell Governmental Affairs, summarizes these arrestee laws (as of July 2014). The map shows which states collect a DNA sample from arrestees at the stage of booking versus indictment, and also provides information on the point at which the sample is analyzed as well as potentially expunged.



Forensic DNA Profiles

Beyond offenders, the second type of DNA profiles are developed from evidence collected from: the body or clothing of the victim; the body or clothing of the suspect(s); and/or items collected from the crime scene(s). These DNA profiles are referred to as forensic profiles, and they are uploaded to the Forensic Index in CODIS.

The profiles are also frequently referred to as *forensic unknowns*, but this does not necessarily mean the suspect in the case is truly unknown. Law enforcement may know who their suspect is, based on information provided by the victim or other sources. The terminology is simply used to distinguish a DNA profile developed from forensic evidence rather than reference standards collected directly from a known individual.

Forensic Index in CODIS

Before a DNA profile can be entered into the Forensic Index of CODIS, laboratories must provide assurance that the evidence is associated with a criminal offense. This is accomplished by establishing the elements of the offense, typically through the victim's initial statement. This is why evidence from a sexual assault case should not be submitted to CODIS until the victim has personally talked with law enforcement.

Identifying a “Hit”

As DNA profiles are submitted to all three indices within CODIS, routine comparisons are conducted. Two types of matches – often referred to as “hits” – can result.

Hit to Offender

The first is a *hit to offender*, where a forensic unknown profile matches to a known offender. Once the match is confirmed, the name of the offender will be provided to the laboratory that submitted the forensic unknown, as well as the investigator in the case. This type of hit can advance a case, either by revealing the identity of a suspect who was previously unknown, confirming the identity of a suspect who was already known, or excluding a suspect from consideration. It can also connect a suspect with evidence collected from other crimes.

Unknown to Unknown

The second type of hit is an *unknown to unknown*, where no offender is identified, but two or more cases are identified as sharing the same forensic DNA profile. This means that the same (still unknown) perpetrator is involved. While this type of hit does not specifically identify a suspect, it can yield investigative leads that may ultimately help law enforcement make an identification and possibly link a suspect to multiple crimes.

Three Tiers of CODIS: Local, State, and National

While people often refer to CODIS as if it were a single entity, it is actually a system of databases that operate on a local, state, and national level.

Local DNA Index System (LDIS)

Most law enforcement agencies use the state crime laboratory to conduct their DNA analysis. However, some agencies contract with private laboratories or establish their own DNA laboratories (which typically operate as a semi-independent unit within the police department). Many laboratories also operate on a regional or statewide level, and/or represent part of a multi-site laboratory system. This means that most laboratories provide services for a number of law enforcement agencies.

In order to access the CODIS program, local laboratories must meet certain requirements, including accreditation from specific credentialing organizations. The laboratory then constitutes part of the Local DNA Index System (LDIS), storing information on DNA profiles developed from cases in that jurisdiction. This will include both offender profiles (collected at the point of arrest and/or conviction, in accordance with state law) and forensic profiles (developed from evidence collected in the case).

Some local databases also include DNA profiles developed from suspect reference standards collected during the course of an investigation, before probable cause has been developed. However, this will depend on state laws, laboratory policies, and local protocols. Suspect reference standards are collected at this point as part of an investigator's casework, in the hopes of identifying, confirming, or excluding a suspect.

Searching for matches

All local laboratories can search for matches within their own LDIS. In fact, a significant number of associations are made at the LDIS level, because most crime occurs within a limited geographic area, with little suspect movement. However, there is widespread variation in the samples maintained in LDIS. For example, in addition to forensic and offender profiles, local databases may store DNA profiles for individuals such as crime victims, employees working in the laboratory, property clerks, and possible suspects (as described above). Most states do not have legislation covering what can be maintained by local laboratories in the LDIS system, so limited guidance is often available.

From local to state level

On a weekly basis, LDIS laboratories electronically send qualifying DNA profiles to the state database, which is referred to as the State DNA Index System (or SDIS). To qualify for submission to SDIS, a DNA profile must have a minimum amount of genetic information (a portion of the 13 core loci). This is done to reduce the likelihood of coincidental matches between forensic unknowns and offender profiles in SDIS.

As a general rule, offender samples will always meet the criteria for sufficient genetic information to upload into CODIS, because they are collected using a buccal swab or blood draw directly from a known individual. However, DNA profiles developed from forensic evidence may not, particularly if the forensic sample was limited or degraded in some way. When a forensic unknown profile does not have a sufficient amount of genetic information, it simply remains at the LDIS level.

DNA profiles developed from suspect reference standards may also be eligible for submission to SDIS, depending on state law and laboratory policies. Again, these reference standards are collected from suspects during the course of an investigation (before probable cause has been developed) – in an effort to identify, confirm, or exclude a possible suspect.

State DNA Index System (SDIS)

The State DNA Index System (SDIS) contains forensic unknowns submitted by each local laboratory in the state, along with offender samples analyzed either by the state laboratory or by a group of laboratories in the state. SDIS may also store profiles from suspect reference standards, depending on state law and laboratory policies.

Like LDIS, each SDIS laboratory conducts a weekly comparison of DNA profiles from across the state. When there is a hit – either to an offender or a forensic unknown – the laboratory submitting each forensic unknown is notified. SDIS laboratories also upload profiles to the national level of CODIS on a weekly basis.

National DNA Index System (NDIS)

The National DNA Index System (NDIS) contains offender profiles collected under the statutory guidelines in each of the 50 states, as well as forensic unknowns submitted by SDIS laboratories across the country on a weekly basis. It does not include suspect profiles developed during the course of an investigation, before probable cause for an arrest has been developed. NDIS is administered by the FBI, and it is explicitly authorized by federal legislation.

For a forensic unknown to move from SDIS to NDIS, there is a higher standard for the minimum amount of genetic information it must contain. Any profiles not meeting this standard will remain at the SDIS level. Once again, the requirements for a minimum amount of genetic information have been established to minimize the likelihood of a coincidental match at the NDIS level.

Like SDIS, NDIS conducts comparisons on a weekly basis. When there is a hit, the laboratory submitting each profile is notified. Because NDIS is national, hits often reveal associations between offender samples and forensic unknowns from more than one state. For example, blood collected from the scene of a burglary in Illinois might match to semen from a sexual assault case in Iowa – or with a known offender convicted of homicide in Alabama.

As of December 2014, the three-tier CODIS system has produced over 270,000 hits and assisted in more than 258,000 investigations.

For additional information, see [Frequently Asked Questions \(FAQs\) on the CODIS Program and the National DNA Index System \(NDIS\)](#), on the FBI website.

Additional Benefits of CODIS

In addition to their significant value in solving crimes, DNA databases yield a number of critical benefits. Perhaps most important, they can help prevent future crimes, by

identifying offenders as early as possible. Law enforcement agencies can also solve more crimes with less money, by targeting perpetrators who re-offend.

Exclusion and Exoneration

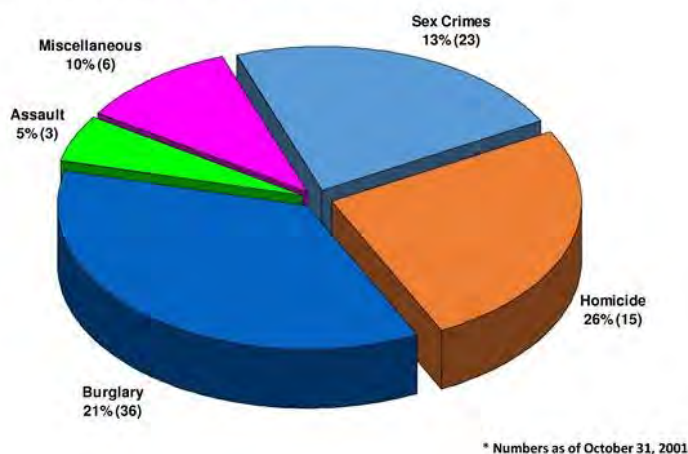
Equally important, DNA databases can help to exclude suspects. In some cases, an innocent suspect may not be arrested because a DNA profile provided the investigator with new information. In others, advances in DNA technology have resulted in retesting or even new testing in old cases where defendants have been serving lengthy jail sentences – including some with a potential death sentence. In the US alone, there have been 325 post-conviction DNA exonerations, according to the Innocence Project.

Crossover Offending

These databases have also demonstrated how much crossover offending takes place, with a broad range of CODIS hits between violent offenses, sexual offenses, and nonviolent crimes such as burglary and drug offenses. Criminals are often involved in a wide range of illegal activity. Yet there is a tendency to view sex offenders as “different” from other types of offenders; they are frequently seen as “monsters” who can be clearly differentiated from the rest of the criminal population. Pioneering work in Virginia helped to shatter this myth by demonstrating not only that sex offenders were *very much like* other offenders – they actually *were* the other offenders.

To underscore this point, the following graph shows the breakdown of CODIS hits with individuals convicted of drug possession. The 21% of hits matching with burglary cases may not be surprising, given how often burglary is used to financially support a drug addiction. However, the 13% match with sex crimes may be unexpected for some.

**Virginia’s “Cold Hits” on the DNA Database
Drug Possession Data**



These findings powerfully demonstrate how much crossover there is between violent, sexual, and nonviolent offending, which highlights the power of DNA to assist in the investigation, prosecution – and ultimately prevention – of crime.

Coming Soon

The next training bulletin in this series will describe where and how to look for biological evidence from sources other than the medical forensic exam. It is entitled, *Beyond the "Rape Kit:" Collecting Forensic Evidence in Sexual Assault Cases*.

For More Information

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Role of DNA Evidence in Sexual Assault Investigations

Part 3: Beyond the “Rape Kit” Collecting Forensic Evidence in Sexual Assault Cases

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In this installment, we will be considering where biological evidence may be found, outside of the medical forensic examination of the victim.

Sources of Biological Evidence

As we have seen in the first training bulletin in this series, [The ABCs of DNA Evidence](#), biological evidence can be found a variety of places, such as clothing, carpet, and furniture. Some other possibilities include suspect examinations and touch DNA.

Suspect Examinations

In addition to a medical forensic examination of the *victim*, a forensic examination should also be conducted *with the suspect*, whenever this is warranted. In some jurisdictions, forensic examinations are routinely conducted with suspects who are arrested within a few days of the assault. *What is the situation in your community?*

For law enforcement personnel, does your agency have a protocol in place for suspect examinations? Or, even if there is no specific policy, are you able to obtain a forensic examination of a suspect who is arrested within days of the sexual assault? If so, who collects evidence from the suspect? Is it an officer, a specialized forensic examiner, a criminalist, or a crime scene technician?

For other community professionals, are you aware of the policies and practices of the law enforcement agencies in your area regarding suspect examinations?

To learn more about this topic and apply it to your jurisdiction, please see our online Training Bulletin on [Forensic Exams for the Sexual Assault Suspect](#).

Touch DNA

When it comes to the sources of DNA evidence, the fastest growing segment is referred to as “touch DNA.” Touch DNA encompasses scenarios where a person comes into contact with another person or object for a period of time, thus leaving some biological material behind. Touch DNA is often enormously important in the analysis of guns, knives, tools, and other implements used in property crimes.

With the advent of touch DNA, the possibilities for recovering biological evidence appear to be limitless. For example, DNA profiles are now being recovered from

sources such as handguns, spent bullet casings, cell phones, tools, flashlights, steering wheels, and gear shifters – even paper documents like a demand note from a bank robbery. Touch DNA can also be recovered in some cases from articles of clothing (e.g., headband of a hat, the waistband of underwear, bra clips, or buttons on pants).

The ability to develop a profile from touch DNA is affected by three critical components:

1. The length of time the subject was in contact with the object.
2. The amount of force applied when touching the object.
3. The number of other individuals who potentially touched the object.

To illustrate these principles, an example can be drawn from a field that is very different from sexual assault. Due to the escalating price of copper, it is quite common for newly constructed housing projects to have copper pipe stolen and sold to recyclers. In some instances, the perpetrators have left their cutting tools behind. These tools have been used with a significant amount of force, with repeated contact by the perpetrators. As a result, DNA testing of swabs collected from these items can often provide DNA profiles of a very high quality, although mixtures can sometimes be present.

On the other hand, laboratories are sometimes asked to test objects that have only been touched briefly by the perpetrator, such as a desk lamp that might have been moved by someone entering a home through a window. This type of momentary contact is unlikely to yield significant DNA, and success rates are therefore very low. Anecdotal evidence also suggests that low success rates have been seen in cases involving physical contact like groping, because the contact between victim and perpetrator is brief, and it often covers a relatively large surface area of the victim's clothing or skin.

The other factor affecting the ability to obtain a DNA profile using touch DNA is the number of individuals who might have come into contact with the person or object over time. With a gun or tool, there may be a limited number of individuals; however, with many other surfaces the potential number of contributors can be significant.

For example, laboratories are often asked to perform DNA analysis on door handles in burglary cases, or convenience store counters in robbery cases. In both of these scenarios, hundreds of people may have come into contact with the surface, each contributing a very small amount of DNA. In these cases, DNA testing is not likely to yield probative information, so the question will be whether any other investigative information is available. If there is no other meaningful information, but the crime is a very serious concern for the community (perhaps because of the threat of possible escalation), the laboratory might agree to conduct the analysis despite the limited chance of success. This is likely to be negotiated between investigators who are desperate for information and laboratory personnel considering the available resources.

Pregnancy and Paternity Testing

Before we conclude this discussion of the possible sources of DNA, it is important to note that a pregnancy resulting from a sexual assault can also yield critical biological evidence. Because 50% of a person's DNA is contributed by the mother, and 50% is contributed by the father, pregnancy can both establish the act of penile–vaginal penetration and identify the suspect at the same time. This evidence can then be used to pursue criminal charges, or to exclude a suspect if his DNA profile is excluded. This can be especially helpful in cases where a consent defense is not available; for example, in cases where the sexual assault offense is based on the victim's incapacity to consent due to age, severe disability, or relationship between the parties (i.e., incest). Evidence of pregnancy can also be important in sexual assault cases where the suspect has denied sexual contact or penetration, because it establishes the act with certainty.

In addition, DNA testing can be conducted on infants after birth or on aborted fetal tissue. In the case of a live child, reference samples can be collected from the child, the mother, and the suspected father. All three samples will then be submitted to a laboratory for analysis, so the mother's contribution to the child's DNA can be isolated. This allows the remaining portion of the DNA to be compared with the reference sample collected from the suspected father. Given the power of current DNA analysis, such testing leaves little doubt as to whether a suspect is in fact the father of the child.

Analysis of aborted fetal tissue involves distinguishing biological material belonging to the aborted fetus from material contributed by the mother. Depending on the age of the pregnancy, separating aborted fetal tissue from maternal tissue can be challenging, and the laboratory may need the assistance of an embryologist to accomplish this. Once fetal material is isolated, the DNA testing process occurs much in the same manner as described for a baby that comes to term.

Because investigators will not typically handle a large number of cases involving fetal tissue, [instructions on how to collect this material](#) can be very helpful. We provide these sample instructions from the San Diego Police Department Sex Crimes Unit, but investigators should determine which laboratory they will use for any such analysis and follow any specific instructions the laboratory might provide.

Where to Look for Biological Evidence

The identification of biological evidence can be a critical step in a successful sexual assault investigation and criminal prosecution. Specialized training is therefore needed to ensure that key evidentiary items are properly identified and collected for laboratory analysis, and that they are appropriately documented, packaged, stored, and protected from potential contamination.

The following table is intended to provide general guidance on the possible sources of biological evidence and the likely location on the item where biological evidence might be found. It is drawn from the [Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers](#), which was published by the National Institute of Standards and Technology and the National Institute of Justice (2013). However, the ultimate determination of whether and where a particular item might contain biological evidence will need to be made by investigators with knowledge of the specific case.

Evidence	Likely Location of DNA on the Evidence	Source of DNA
Baseball bat or similar weapon	Handle, end	Sweat, skin, blood, tissue
Hat, bandanna, mask	Inside	Sweat, hair, dandruff
Eyeglasses	Nose or ear piece, lens	Sweat, skin
Facial tissue, cotton swab	Surface area	Mucus, blood, sweat, semen, ear wax
Dirty laundry	Surface area	Blood, sweat, semen
Toothpick	Tip	Saliva
Used cigarette	Cigarette butt	Saliva
Stamp or envelope	Licked area	Saliva
Tape or ligature	Inside/outside surface	Saliva, skin
Bottle, can, glass	Side, mouthpiece	Saliva, sweat
Used condom	Inside/outside surface	Semen, vaginal or rectal cells
Blanket, pillow, sheet	Surface area	Sweat, hair, semen, urine, saliva
“Through and through” bullet	Outside surface	Blood, tissue
Bite mark	Person’s skin or clothing	Saliva

Source: [Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers](#), National Institute of Standards and Technology and the National Institute of Justice (2013).



Evidence	Likely Location of DNA on the Evidence	Source of DNA
Fingernail, partial fingernail	Scrapings	Blood, sweat, tissue

When in Doubt, Collect It

Even if all of the items collected from a crime scene will not be examined by the laboratory, it is generally considered better to collect and store any evidence that might potentially be probative, rather than not to collect at all.

To offer an illustration, semen may be deposited on a bedsheet or bedroom carpet after a victim is sexually assaulted and forced to orally copulate a suspect. Some officers may not collect the sheet or carpet, based on the presumption that the victim's mouth swab will contain the probative semen evidence needed to prosecute the case. However, this is an optimistic view that is not always supported by case outcomes. Officers are often given only a single chance to collect such critical evidence and overlooking or ignoring it could lead to the suspect either destroying the evidence, or cleaning it up after the opportunity for collection has passed. Fortunately, research indicates that DNA samples collected by patrol officers are as likely to yield high quality evidence as those collected by forensic technicians – at least in property crime cases (see National Institute of Justice, [Summary Findings of the DNA Field Experiment](#)).

Coming Soon

The next training bulletin in this series is designed to help you build your skills in assessing the potential evidence in a sexual assault case. In it, you will learn how DNA can be used beyond identification of a suspect, how to evaluate evidence as a case unfolds, and how to make the best possible use of limited laboratory resources.

For More Information

For more information, please register for our OnLine Training Institute module, [Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations](#). Launched in November 2015, this comprehensive module explores the complex role of DNA in a sexual assault investigation, including the alternative sources of DNA evidence and their potential significance or impact on a sexual assault investigation. A number of resources and tools are provided, along with a series of complex and interactive case examples. It is authored by Sgt. Joanne Archambault, Dr. Kim Lonsway, Dr. Patrick O'Donnell, and Special Agent Lauren Ware.

For more information on the possible sources of evidence, the [National Forensic Academy](#) offers an intensive 10-week course on Crime Scene management, with funding provided by the Bureau of Justice Assistance. The course is designed to meet the needs of law enforcement professionals in evidence identification, collection, and preservation. Detailed information is available on their website.

Valuable guidance is also provided in the [Biological Evidence Preservation Handbook](#), which was published in 2013 by the National Institute of Standards and Technology and National Institute of Justice. This document includes the table provided in this bulletin, along detailed guidance for crafting evidence retention policies and procedures.



End Violence Against Women International
(EVAWI)

Role of DNA Evidence in Sexual Assault Investigations

Part 4: Making the Most of Biological Evidence

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In this installment, we offer recommendations on how to make the best possible use of limited laboratory testing resources. This includes conducting a thorough investigation and successfully interviewing the victim, and effectively communicating with laboratory personnel. Practical information and tools are provided in each area.

Making the Most of Biological Evidence

DNA and other biological evidence can only advance a sexual assault case if it is analyzed within the context of a thorough law enforcement investigation. Yet in far too many cases, this does not happen, often because the victim is not believed. Consider this example from Cleveland, Ohio:

In 2008, a woman ran to police, bleeding and screaming for help after she escaped from Anthony Sowell's Imperial Avenue home. Her injuries required more than a dozen stitches.

Responding officers interviewed the woman, collected her clothing, and took pictures of her injuries. Hospital personnel conducted a medical forensic examination documenting that the victim had also been strangled. At Sowell's home, police found signs of a struggle and blood. They interviewed Sowell and took pictures of injuries on his shoulder and legs.

Despite the fact that Sowell was a registered sex offender who had previously served 15 years in prison for rape that also involved strangulation, no follow-up investigation of Sowell was documented by the assigned detective, and the forensic evidence was not submitted to a laboratory for analysis.

The next year, the decomposing bodies of 11 women were discovered on Sowell's property, and he was ultimately convicted and sentenced to death for their murders. Five of these women went missing after the 2008 assault that was reported and closed by the investigator as unfounded.

Clearly, the failure to analyze evidence in this case was merely a symptom of the far more significant failure to believe the victim's report. In another case described in the



OLTI module, a detective failed to investigate the case assigned to him because he believed the victim was lying, and instead spent his time and effort ensuring that she was prosecuted for filing a false report. That decision came with a very heavy price for the victim: she suffered physically and emotionally, her relationships and stability deteriorated, and ultimately, she fell into financial ruin. In Cleveland, however, it cost at least five women their lives.

We therefore continue our discussion of DNA by outlining the *other investigative steps* that must be taken in a sexual assault case to advance it toward successful resolution. This is the only way to truly make the most of DNA and other biological evidence.

Conduct Effective Victim Interviews

Perhaps the most important step in a sexual assault investigation is the victim interview. The victim's account can help an investigator to establish case facts, identify suspects, and locate additional sources of information and evidence, including witnesses. Yet investigators know from research and practice that the victim's account of a sexual assault may be distorted by the impact of trauma, which affects their perceptions and memories, even when they are trying their best to offer a truthful narrative.

The information and evidence gathered during the victim interview is critical to help law enforcement evaluate the probative value of various pieces of evidence and determine what should be submitted to the laboratory for analysis. It is therefore important to ensure that interviews are conducted following recommendations for best practice.

EVAWI offers a number of resources to support law enforcement in conducting victim interviews that are "trauma-informed." In our webinar archive, we offer recordings of a number of helpful presentations, including one given by Dr. Rebecca Campbell, from Michigan State University, on the topic of [The Neurobiology of Sexual Assault](#).

Another archived webinar is entitled: [A Paradigm Shift: The Forensic Experiential Trauma Interview \(FETI\)](#). Training is provided by Chief Russell Strand of the US Army Military Police School and EVAWI's Executive Director, Sergeant (Retired) Joanne Archambault.

There is also a two-part series on the *Neurobiology of Sexual Assault* presented by Dr. Jim Hopper of Harvard University. In Part 1, Dr. Hopper focuses on the topic of [Experience and Behavior](#), while Part 2 emphasizes [Experience and Memory](#).

Finally, we offer an archived webinar on [Effective Victim Interviewing](#), by prosecution expert Roger Canaff and EVAWI's Sergeant Joanne Archambault (Retired). While it does not specifically address the neurobiology of trauma, detailed guidance is provided about how to plan and conduct successful interviews with sexual assault victims.

Collect and Store Evidence Appropriately

Another critical step is to collect and store all evidence appropriately. Detailed guidelines are beyond the scope of this training bulletin, but the full OLT module includes model policy materials for [Evidence Retention and Disposition and/or Removal](#). These materials provide sample language that can be used when crafting an agency policy, as well as instructional commentary and other supplementary resources – so it can be used as an educational tool, as well as supporting the development of policies, protocols, and training materials. The document is provided in Word format, so law enforcement agencies can easily adapt it for their own use.

Consider the Number of Items to be Analyzed

Once the victim interview has been conducted, and other investigative steps taken to gather information and evidence, investigators can evaluate the case facts and prepare a request for laboratory services. Yet policies and procedures for laboratory analysis vary across jurisdictions, particularly with respect to the evidence collected during a medical forensic examination.

When the victim of a sexual assault has had a medical forensic examination, some jurisdictions have a policy of testing all the swabs in the evidence kit. Others also analyze some key articles of clothing (e.g., underwear). Still others extend their analysis to additional items beyond the evidence kit (e.g., clothing, bedding, or other crime scene evidence). However, investigators in some jurisdictions are limited to a certain number of evidentiary items for their laboratory service request (often 3 or 5). In that situation, it will be critical to evaluate the information and evidence available to determine which items might be the most likely to yield probative biological evidence.

So, at this point, please consider the situation in your community. Are all of the items in a sexual assault evidence kit typically analyzed by the laboratory in your jurisdiction? Or does the laboratory only analyze specific items that are requested? Is clothing typically analyzed? Does the request need to be limited to a certain number of items?

Please mark all of the following that apply, to describe the situation in your jurisdiction:

- All the swabs in the evidence kit are typically analyzed.
- All the swabs in the evidence kit can be analyzed, if requested
- If collected, the victim's underwear is usually screened and/or tested.
- Other evidentiary items can be screened/tested, if requested (e.g., clothing, condoms, tissues)
- Only a certain number of evidentiary items can be submitted for analysis (e.g., 3 or 5).

- If screening/testing of the first set of items does not yield findings, a second set of items can be submitted for analysis.

Use the space below to explain the protocol for laboratory analysis in your jurisdiction:

Prioritize Items for Analysis

Because of the increasing demand for DNA laboratory services, it is important for law enforcement personnel to work as efficiently as possible. This can be accomplished by prioritizing laboratory requests based on all the information and evidence available in an investigation. This will help investigators and criminalists determine which items are most likely to yield probative evidence, which can potentially improve case outcomes.

You will have the opportunity to practice this type of decision making in the case examples presented later in this training bulletin series. In sexual assault cases, it is helpful to list the items of evidence in each of the following categories and then determine their priority for laboratory analysis. Here are some examples:

Victim Clothing

- Clothing worn at the time of the assault
- Clothing put on after bathing or showering, if relevant
- Underwear worn to the medical forensic examination, if different

Medical Forensic Examination

- External peri-oral swabs taken from around the mouth (not the lips)
- Oral swabs from inside the mouth
- Fingernail scrapings/swabbing's
- Body surface swabs (such as neck, breasts, thighs)
- External genital swabs

- Internal vaginal/cervical swabs
- External anal swabs
- Internal rectal swabs

Crime Scene Evidence

- Condoms
- Tissues, towels, or other items used to clean up after the sexual assault
- Bedding, upholstery, or carpeting that might contain biological evidence
- Foreign objects used during the sexual assault

In some instances, you might group together a limited number of items (e.g., the internal vaginal and anal swabs, penile and scrotal swabs). However, we recommend that you consider each item individually, because your task is to critically evaluate and prioritize all of the available evidence in terms of its potential to advance the investigation. In addition, you will need to consider each item of clothing based on the victim's statement and the findings from the medical forensic examination, to help you prioritize which evidence should be screened and tested.

Improve Communication with the Laboratory

There are also a number of ways to improve communication between law enforcement investigators and laboratory personnel. In too many agencies, evidence is sent to criminalists without any communication regarding where – specifically – DNA might be found, or how to prioritize the analyses requested. Laboratory analysis takes time and money, and those resources should target the most valuable sources of evidence in a particular case.

For some types of evidence, a lack of communication will not create a significant problem; for example, a vaginal swab will simply be analyzed to develop any foreign DNA profiles (and exclude any consensual partner). The meaning of any resulting DNA profiles will then be interpreted within the context of the assault history, but the actual testing of a vaginal swab will generally be the same from one case to another.

For other types of evidence, however, communication may be able to improve the efficiency of analysis rather significantly. For example, in a case where a sexual assault is committed on the victim's bed, and a comforter is submitted to the laboratory for analysis, a great deal of time can be wasted if criminalists are provided no information as to where specifically they might look for biological evidence.



Submit an Efficient Laboratory Service Request

Challenges can arise when there is poor communication between law enforcement investigators and laboratory personnel. For example, investigators might not understand why a criminalist makes certain choices about evidence examination. At the same time, laboratory personnel often get frustrated with requests from detectives that are incomplete or inaccurate, as well as requests for everything to be analyzed, without prioritizing the analysis based on case facts. Fortunately, with proper training, clear expectations, and proper documentation, these issues are easily resolved.

Required Information

First, there is the question of what information should be provided by law enforcement when submitting a request for laboratory analyses. While there are likely to be variations, most Laboratory Service Requests should include the following:

- Name of Victim
- Name of Suspect
- Case number
- Criminal offense(s)
- Date of occurrence
- Unit handling the case
- Investigator assigned to the case
- Investigator's phone number, email, and mail station
- Date of the request

This information is needed for laboratory personnel to generate an accurate report and to contact the investigator assigned to the case, if additional details are needed.

Case History

The most critical portion of any Laboratory Service Request is the case history. In this section, investigators communicate what the most significant aspects of the sexual assault are in terms of evidence collection and analysis. The following information should be provided to laboratory personnel, if it is available:

- Whether force was used to commit the sexual assault
- Whether the victim was incapacitated by drugs or alcohol during the sexual assault

- What sexual acts were committed
- Whether one or more suspects might be involved
- Whether consent or identity is the issue
- Whether a condom is believed to have been used
- Whether the victim described ejaculation, and if so where
- Whether the victim and/or suspect had a forensic examination
- Whether the victim showered, bathed, or douched after the assault

Investigators can augment this case history by providing a copy of the crime scene report, which might include photographs and diagrams. It is also important to include any reports by health care providers who conducted a forensic examination of the victim and/or suspect(s).

Other information should be provided specifically about the *evidence*, including:

- What evidence was collected, and from where
- Who else might have had contact with the evidence
- What environmental conditions the evidence might have been exposed to (e.g., sitting in the sun for a period of time)
- Which specific clothing items were worn by the victim or suspect(s) during and/or immediately after the assault
- Whether the evidence (e.g., clothing, bedding) was washed or cleaned after the assault
- Whether the victim had consensual sex within a matter of days, and if a reference standard was obtained from the consensual partner
- Whether a reference standard was collected from the suspect

Two sample Laboratory Service Request Forms have been created by the San Diego Police Department and are provided as examples. One is an [Excel spreadsheet](#) and the other is in [Word format](#). The forms can be used to improve communication between law enforcement investigators and laboratory personnel.

The [Excel spreadsheet](#) is the version of the Laboratory Service Request Form currently in use, which asks investigators to write a brief narrative of the assault history, so criminalists can prioritize the items to be analyzed and identify the locations on those items where probative evidence is most likely to be found.



The [Word version of the form](#) requires investigators to review the case history themselves and fill out the form to communicate with criminalists the priority order for items to be analyzed and the locations on those items where probative evidence is most likely to be found. Both versions have advantages and can be easily adapted for use by law enforcement agencies.

Number of Items for Analysis

There is one important difference between the two versions of the Laboratory Service Request Form provided in the box above – the number of items listed for analysis. The version currently used by the San Diego Police Department (in [Excel format](#)) does not limit the number of items that can be listed. However, the prior version includes space to list up to five specific items of evidence. They are to be prioritized in terms of:

1. Where DNA evidence is most likely to be found, and
2. What the potential impact on the case would be (if DNA was found).

The older version of the form (in [Word format](#)) also requires investigators to choose a specific description for each item (such as “victim’s underwear” or “vaginal swab”) rather than providing a vague or general description (e.g., “victim’s clothing,” or “rape kit”).

Although the older version of the Laboratory Service Request includes space for up to five items of evidence, most Sex Crimes detectives working in the San Diego Police Department typically requested that only two or three items actually be evaluated by the laboratory. This is very different from the typical request that was historically made by detectives across the country, asking the laboratory to: “Analyze all evidence for trace and semen.” Neither detectives nor their supervisors often understood the process set in motion as a result of such an overgeneralized – and therefore meaningless – request.

With an assessment of the case history, it often becomes clear which specific analyses of what items are most likely to advance the case. It also helps to take into account other factors that might influence the interpretation of test results. This is why some laboratories are now establishing policies limiting the number of analyses that can be requested per case (e.g., 3-5). This is done in an effort to use the limited resources available most efficiently, by identifying items that will most likely yield probative evidence. If probative evidence is not located on the first set of items, additional analyses can be requested.

Documentation of Clothing Evidence

Another tool that can greatly improve communication between law enforcement agencies, forensic examiners, and laboratory personnel is a [Clothing Documentation Form](#). This form should be used to document answers to the following questions:

- What clothing was the victim wearing prior to and during the assault?
- Was clothing used to wipe the genitals following a sex act?
- What clothing did the victim put on after the assault?

Most officers are not taught to identify specific items of clothing separately in their documentation. However, each individual item of clothing should be photographed, examined, and documented separately. The Clothing Documentation Form can then be used to record observations by the law enforcement investigator or forensic examiner, regarding any visible signs of foreign material and the general condition of the item (e.g., whether there are any tears, stretched out material, missing buttons, wet stains).

Suspect Reference Standards

Along with the request for laboratory services, investigators should submit reference standards from the suspect(s) whenever possible. Many investigators question whether this is necessary if the suspect's identity is known, but there are other reasons for collecting a suspect's reference standard beyond simply establishing or confirming identity. At some point, the suspect's profile might need to be compared with evidence collected during the investigation, to confirm the match. In addition, the profile can be searched within the local and possibly state and national databases, to reveal any prior arrests, convictions, or connections with other cases.

If the investigator submits the suspect's reference standard during the course of the investigation, the results might be returned in time to assist in the investigation. This is especially true in jurisdictions where the analysis is conducted by a local laboratory, because testing can generally be conducted more quickly than a state laboratory might be able to.

Some investigators also question whether reference standards are needed if the suspect is already in CODIS for a prior offense (i.e., in the Arrestee Index or Convicted Offender Index). Again, the answer is yes. By analyzing the suspect's DNA on a local level, it can be compared with evidence collected in the case and compared with other offender profiles and forensic unknowns on a local, and possibly a state level. In addition, if the profile is uploaded to CODIS and there is a hit within SDIS or NDIS, the match will need to be confirmed at the local level, so a local scientist can testify in the case.

Some laboratories will not analyze evidence in a case where the suspect is known, if no reference sample has been collected from that suspect. Investigators should discuss this issue with their laboratory, to determine what their current policy is and to develop a protocol for addressing it. Laboratories may also need to be flexible, because the attempt to collect a reference sample from a suspect prior to arrest may result in the suspect fleeing the jurisdiction. This is a particular concern for authorities working in border communities, where it is easy for a suspect to flee into Mexico or Canada.



Requests Must Be Complete

In sum, laboratories cannot efficiently proceed with testing until they have all the evidence and information needed prior to the analysis. This includes information concerning the forensic evidence and clothing collected from the victim, forensic evidence and clothing collected from the suspect(s), any consensual sex within a matter of days of the victims' examination, and details regarding the necessary reference samples (from the suspect as well as any consensual partners if possible). Incomplete requests – for example, those lacking all required reference samples – will often result in significant delays in the laboratory analysis of evidence.

Coming Soon

As you have seen throughout this series of training bulletins, DNA and other biological evidence can be powerful tools in sexual assault investigations, but they are most effectively used in the context of a thorough investigation that includes carefully prioritizing what evidence should be tested and clearly communicating the parameters of analysis to the laboratory.

The next two training bulletins will give you a chance to practice using your tools and knowledge in realistic case examples.

For More Information

For more information, please register for our OnLine Training Institute module, [*Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations*](#). Launched in November 2015, this comprehensive module explores the complex role of DNA in a sexual assault investigation, including the alternative sources of DNA evidence and their potential significance or impact on a sexual assault investigation. A number of resources and tools are provided, along with a series of complex and interactive case examples. It is authored by Sgt. Joanne Archambault, Dr. Kim Lonsway, Dr. Patrick O'Donnell, and Special Agent Lauren Ware.





End Violence Against Women International
(EVAWI)

Role of DNA Evidence in Sexual Assault Investigations

Part 5: Collecting Forensic Evidence in a Sexual Assault Case and Prioritizing Requests for Laboratory Analysis

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September 2016

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Lauren Ware is the Chief of the Forensics and Special Investigative Branch at the Federal Law Enforcement Training Center (FLETC) in Glynco, Georgia. In this position, Ms. Ware leads a staff of 16 forensic instructors who are responsible for researching, designing and delivering the most current, relevant, and accurate forensics and specialized investigative techniques available to federal law enforcement officers. Prior to this, Ms. Ware spent ten years as a special agent with the Air Force Office of Special Investigations (AFOSI) and continues to serve in a reserve capacity. Her formal education includes a bachelor's degree in Physical Anthropology awarded from the University of Hawaii, and a master's degree in Forensic Sciences, with a concentration in crime scene investigation, from George Washington University.



This is the fifth training bulletin in our series on DNA evidence, based on the 32-hour OnLine Training Institute (OLTI) module, [*Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations*](#). The module is co-authored with Dr. Patrick O'Donnell (Supervising Criminalist, San Diego Police Department), and Lauren Ware (Chief of the Forensics and Special Investigative Branch at the Federal Law Enforcement Training Center in Glynco, GA).

In this installment, we will be looking at a realistic case example and considering where biological evidence may be found, outside the victim's medical forensic examination. By necessity, this bulletin will present an abbreviated version of the exercise. For the valuable experience of working through the entire case example and obtaining feedback on your responses, we encourage you to [register](#) for the course.

We begin by presenting the facts of the case, and then we will ask you a series of questions to guide you through the process of reviewing the evidence that is available and evaluating which is most likely to yield probative evidence. This analysis will be used to determine what requests for service will be submitted to the forensic laboratory.

Case Synopsis

The victim, a 16-year-old girl named Jackie Thomas, told her parents she was sexually assaulted on Friday night, at approximately 2100 hours, by a 28-year old man she knows as Jim. Jim lives in the neighborhood and coaches soccer. Thomas said at first they were just talking and watching a movie but then the suspect sexually assaulted her on his living room couch. Thomas said she told the suspect to stop, but he didn't.

The suspect told Thomas not to tell anyone or she would get in trouble. The victim said she had never been to the suspect's home before, but he invited her over to talk about how she could improve her soccer game.

Thomas believes Jim is married, but no one else was home at the time of the sexual assault. She said Jim had never been inappropriate before, and she had never been sexually active with anyone. Following the sexual assault, Thomas began having trouble sleeping and eating, so she decided to tell her parents late Tuesday morning. Her parents called the police at 1430 hours on Tuesday afternoon.

Preliminary Response

Communications dispatched Officer Davis to meet the victim and her parents at their home to evaluate a report of rape. With the consent of the victim and her parents, Officer Davis interviewed the victim in private to obtain a preliminary statement. The victim described how the suspect forced his penis into her vagina after she told him to stop. The victim believes the suspect ejaculated, and she thinks he might have used a condom.

After the sexual assault, when the victim returned home, she showered “for a very long time” before putting on her sweats and going to bed. She also showered at least three more times before talking to her parents.

Medical Forensic Examination

After obtaining the victim’s preliminary statement, Officer Davis facilitated a medical forensic examination, which began at 1530 hours.

During the examination, the Sexual Assault Nurse Examiner (SANE) collected the underwear the victim was wearing. Then, following standard protocol, the SANE collected a variety of swabs from in and on the victim’s body. The SANE also collected swabs from inside the victim’s mouth as well as the external area around the victim’s mouth. Fingernail scrapings/swabbings were collected from the victim, as well as body surface swabs of the victim’s neck, breasts, and thighs. In addition, the SANE documented injuries to the victim’s genital area, as well as a bruise/suck mark on her left upper chest. The SANE ultimately concluded that the visible findings “were consistent with the history provided by the patient.”

Post-Examination Briefing

Following the examination, the SANE briefed the officer, comparing what the officer told her prior to the examination and what she learned during the examination. The SANE said the victim told her that the suspect was drinking beer when she arrived, and he offered her a beer, which she took. The victim said she didn’t even finish the whole beer. She did not feel intoxicated or incapacitated in any way. She said she hadn’t mentioned the beer to her parents or Officer Davis because she didn’t think it was a big deal.

The SANE advised Officer Davis that the clothing the victim was wearing at the time of the sexual assault was still in her laundry basket. Also in the laundry basket was a pair of sweatpants the victim put on immediately after showering. (She did not wear underwear with the sweatpants.)

The victim said she wasn’t sure if the suspect wore a condom during the sexual assault, but she heard what she thought was a wrapper being opened. She never actually saw a condom, new or used, at any time. The victim said that she used a Kleenex to clean herself afterwards, because she was bleeding from her vaginal area. She said she discarded the Kleenex in the suspect’s bathroom waste basket.

What Evidence to Collect?

At this point, we would like you to pause and ask yourself, “What additional evidence should be collected in this case?”

Please take a moment and list at least three additional items of evidence that should be collected, in the box below:

Victim's Clothing

While you might have listed many different types of evidence to collect, hopefully one of them was the clothing worn by the victim on the night of the assault.

Based on the information provided by the victim as well as the SANE, the next investigative step taken by the reporting officer in this case was to collect the clothing the victim was wearing on the night of the assault, which was retrieved from her laundry basket. Each item was impounded in a separate paper bag, clearly indicating which items were worn at the time of the assault (and put back on immediately afterward) and which were put on after showering (the sweatpants and t-shirt).

This example highlights the importance of communication between the forensic examiner, the reporting officer, and any responding detectives. Victims often wear clothing to the examination that is not likely to yield probative biological material – for example, if they changed clothes several times after the sexual assault. Therefore, it is important to find out whether any clothing or other crime scene evidence needs to be collected from other locations. When asked, the victim might indicate that the clothing worn at the time of the assault is now on a bedroom floor, in a laundry basket, etc.

Victims also frequently dress quickly after being sexually assaulted, and perhaps leave an item of clothing (or other item) at the location of the sexual assault. These items are also important to collect, not only for potential biological evidence but also to place the victim at the location of the assault.

Other Investigative Steps

Beyond this immediate step of collecting the victim's clothing from the laundry basket, a number of other responses should be considered. They can then be prioritized based on the determination of what constitutes the most promising investigative strategy. Some of the possible investigative steps that could be taken include the following:

- Asking the victim to make a pretext (one-party consent) phone call, or to send a (pretext) text message to the suspect.

- Conducting a non-custodial interview with the suspect (e.g., on the phone, in the suspect's home)
- Obtaining consent or a search warrant for a forensic examination of the suspect, including a DNA reference standard.
- Obtaining a search warrant (or written consent depending on Department policies) for the suspect's home.

When considering these possibilities, there is no single “right answer” for how to proceed. This is particularly true because many of these strategies have trade-offs. For example, pretext phone calls (or texts) are often most advantageous if they are made before the suspect is aware of an ongoing investigation. Prioritizing this strategy might therefore mean delaying any suspect contact (e.g., to conduct an interview, obtain a forensic examination, or execute a search warrant).

Suspect Contact

After reviewing the information and evidence collected during the preliminary investigation, the detective assigned to the case decided to contact the suspect, Jim Flowers, at his home as soon as possible. When he first made contact, the detective advised the suspect that he was not under arrest and that he could tell the detective to leave his home at any time. Flowers invited the detective in and agreed to talk to him. The detective then asked the suspect to tell him what happened on Friday evening.

The suspect said the victim came to his house on Friday evening, but the two did not have any sexual contact – at that time or any other time. He said he only invited her to come over because she had asked him to help her with her soccer game.

Following the suspect's statement that he did not have any sexual contact with the victim, the detective obtained a telephonic search warrant to search the suspect's home and to obtain a DNA reference standard from the suspect. This was conducted in accordance with state laws, as well as Police Department policies and procedures.

The search included:

- Looking for condoms or condom wrappers. None were found.
- Looking for the tissue the victim discarded in the waste basket. The investigator learned that the wastebasket had been emptied, and the weekly trash had been collected.
- Screening of the living room couch and the surrounding carpet with an alternate light source by a crime scene technician to determine whether any of the victim's biological material could be located (e.g., epithelial cells, blood). The results were

inconclusive. The couch cushions were removed and impounded for further testing.

Prioritizing Items for Analysis

With all of the evidence and information collected in this case, the detective then had a number of important decisions to make regarding which laboratory analyses to request. Fortunately, we have created a number of tools to assist in this process.

Tools to Assist in Case Assessment

The [Sexual Assault Case History and Analysis Form](#) was described in [Training Bulletin #4](#) in this series. It is designed to help guide investigators through the process of evaluating the assault history and available evidence, to determine which items are most likely to have probative value and therefore advance the case.

We also offer two versions of a Laboratory Service Request Form – one in [Excel format](#) and one in a [Word document](#). Both can be used to improve communication regarding the priority of requested analyses and the specific locations where evidence might be found. These were also described in [Training Bulletin #4](#). We would like you to print out these forms and practice filling them out using information from this case example.

You may not have all the information you need from this abbreviated version of the case example to complete these forms, just as some information may be lacking in real-life cases. However, it is worthwhile to practice entering the information you have. In the OLT module, you have the opportunity to practice using the forms in a number of case examples, and then compare them with our completed versions.

Reviewing and Prioritizing Evidence

One of the most important tasks in this process is considering all of the available evidence and determining where probative evidence is most likely to be found. Therefore, we offer a practical exercise to help you prepare for this task.

Please review the list of evidentiary items below, and rank them in order from the highest (1) to lowest (5) order of priority for analysis. Not all items will be included in the ranking. Also, keep in mind that there is no single “right answer” to this task.

Victim Clothing

- Shirt (worn at the time of the assault)
- Shorts (worn at the time of the assault)
- Bra (worn at the time of the assault)
- Underwear (worn at the time of the assault)

- Sweatpants (put on after showering)
- T-shirt (put on after showering)
- Underwear (worn to the examination)

Medical Forensic Examination

- External peri-oral swabs taken from around the mouth (not the lips)
- Oral swabs taken from inside the mouth
- Fingernail scrapings/swabbings
- Body surface swabs (such as neck, breasts, thighs)
- External genital swabs
- Internal vaginal/cervical swabs
- External anal swabs
- Internal rectal swabs

Crime Scene Evidence

- Couch cushions

How Items Were Prioritized

There is no “right answer” to ranking evidentiary items in terms of their priority for laboratory analysis. However, this is the type of thought process that investigators should use to prepare a Laboratory Service Request. Although this may be a new concept in some jurisdictions, it is important because it ensures that the criminalist is examining the evidence that is most likely to be probative, based on the victim’s statement and other information. It also allows the laboratory to work much more efficiently, which can help to reduce backlogs and allow more evidence to be tested.

For this case example, we provide you with a completed version of the [Sexual Assault Case History](#) as well as the [Laboratory Service Request](#). You can use these to compare your responses with ours, and learn more about the process.

Based on the specific facts of this case, and the timing of the victim’s medical forensic examination, the first priority for analysis is likely to be the underwear the victim was wearing at the time of the sexual assault. Vaginal drainage could be recovered from the underwear, and this might include semen, even if the suspect used a condom. For example, he might have engaged in sexual activity that left pre-ejaculate fluid in or on the victim’s body, before he put the condom on. Biological material might also be recovered from other sexual acts not involving the suspect’s penis (e.g., cunnilingus or digital penetration).

Although swabs from the medical forensic examination will also remain an option for analysis, the likelihood of recovering foreign biological material is decreased by: (1) the amount of time that elapsed between the sexual assault and the medical forensic examination (3 ½ to 4 days), as well as (2) the fact that the victim showered four times in that time period. As a result, the next priority is likely to be the victim's bra, because the suspect sucked on her breast during the sexual assault and the bra was never entirely removed.

However, if the clothing wasn't available, the swabs might have been a higher priority for analysis. It is important to keep in mind that research now indicates biological material can remain on and in the victim's body far longer than previously believed – even after showering or bathing. This will become even more true as DNA technology continues to advance, and evidence is recovered after increasingly long periods of time. If the victim's underwear and bra were tested, and the results came back negative, it is possible that the next priority for analysis might be the swabs taken from the victim's left upper chest, where the suck mark was documented by the SANE.

In this hypothetical case example, the detective listed the couch cushions as the fifth testing priority on the [Laboratory Service Request Form](#). However, if the victim's clothing had not been available in this case, or if the victim did not have a medical forensic examination, the couch cushions might have been the only evidence available for laboratory analysis. In that case, the laboratory service request would have asked to screen the cushions for the victim's DNA (e.g., blood, vaginal fluids). Identifying the suspect's DNA on his own couch would not advance this case in any meaningful way.

Laboratory Findings

When the investigator received the report from the laboratory, one of the results indicated that semen was found on the underwear the victim wore at the time of the sexual assault. DNA testing then matched the profile to the suspect's DNA reference standard. This result could serve a variety of purposes in terms of this investigation. We would like you to take a moment and think about what these various purposes might be.

Which of the following purposes could potentially be met with this laboratory result, based on the information provided so far? Check all that apply.

- Establish sexual contact
- Establish vaginal penetration
- Include suspect
- Exclude suspect
- Link local cases based on any DNA profiles developed

- Corroborate the victim's statements
- Challenge the victim's statements
- Corroborate the suspect's statements
- Challenge the suspect's statements

Because the suspect's semen was recovered from the victim's underwear, this helps to establish sexual contact between the suspect and victim. It does not specifically establish vaginal penetration, as it would if the suspect's semen was found on the victim's internal vaginal/cervical swabs. However, this type of evidence may not be available given the length of time between the sexual assault and the medical forensic examination. The semen on the victim's underwear also corroborates the victim's statement that penile-vaginal penetration took place. It also directly challenges the suspect's statement that he did not have any sexual contact with the victim.

At this point, the suspect's DNA profile (from the semen evidence) could be compared with others in the local DNA database (LDIS), to see if it links with any other cases. If the profile is CODIS eligible, it might also be uploaded to SDIS and/or NDIS to search for matches on a state and/or national level. If the forensic profile hits with a known offender, it will identify prior arrests or convictions that might have taken place in other parts of the country. The profile could also match to one or more additional sexual assault cases based on forensic evidence.

Testing Process

Because the suspect's semen was found on the first item the detective requested the criminalist to test, the victim's underwear and other items did not need to be tested. Generally speaking, testing will only continue if the results could establish additional offenses and elements of those offenses. However, this will often depend on policies of the Police Department and Laboratory as well as the Prosecuting Attorney's office.

Analysis should generally proceed in a step-by-step fashion with each item prioritized based on the victim's statement, any forensic examinations of the victim and/or suspect(s), and other information developed during the course of the investigation. If the results from the first item establish the suspect's identification and the element(s) that need to be proven in a particular case, analysis might very well stop at that point.

Coming Soon

We hope you found this case example helpful, to illustrate how a law enforcement investigation unfolds with specific case facts, and how investigators can evaluate all of the information and prioritize evidence for analysis. More detailed opportunities for practice are available in the OLT module.

In the next training bulletin in this series, we will provide another case example, so you can enhance and apply your knowledge. We will consider how DNA can be used to advance the investigation in a sexual assault case involving multiple suspects, and we will include the results of a forensic examination of the victim as well as the suspects.

For More Information

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End Violence Against Women International
(EVAWI)

Role of DNA Evidence in Sexual Assault Investigations

Part 6: Considering Multiple Sources of DNA: Victim and Suspect Forensic Exams, Clothing, and Crime Scene

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September 2016

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So far, we have looked at the basics of DNA evidence, how CODIS works, and the collection of forensic evidence in sexual assault cases beyond the “rape kit.” We have also described how to improve the way in which evidence is submitted to crime laboratories and worked through a case example demonstrating principles of evidence collection and prioritizing evidence. In this bulletin, we use another case example to explore how DNA analysis can be used to advance an investigation. We consider how DNA can be used in a complex case, and how to evaluate evidence as an investigation progresses. For additional information about the case example and interactive exercises, we encourage you to [register](#) for the OLTI module from which this material is drawn.

Case Synopsis

Cassi Jackson, the 19-year old victim, called 911 to report that she was just raped. She said she went to visit her boyfriend at around 1800 hours, but he wasn't home. Instead, two of his friends, Tyrone Crosby and Max Verduzco were there, and they invited her in to watch TV. They watched TV for a while, but then the two suspects demanded sex from the victim. When she refused, they carried her into the bedroom where they took turns raping her vaginally on top of the bed. Jackson said she believes both suspects wore a condom during the sexual assault, and she believes they both ejaculated.

Jackson estimated that the assault took place between 1930 and 2000 hours. Afterward, she said she “threw on her clothes,” and went home as fast as she could. The victim called 911 around 2030 hours, and Deputy Cathy Garcia responded. Deputy Garcia conducted a preliminary interview with the victim, where she obtained an initial statement. Deputy Garcia also determined that Jackson was still wearing the clothing she had on at the time of the assault.

The victim and Deputy Garcia tried to call the victim's boyfriend, Jerald Ferguson, but he didn't answer his cell phone. Jackson gave Deputy Garcia his cell phone number and his address. Deputy Garcia then spoke to her sergeant who dispatched another Deputy to the victim's boyfriend's home, but no one answered the door.

Deputy Garcia transported the victim to Eisenhower Valley Women's Institute at 2100 hours for a medical forensic examination. Deputy Garcia briefed Diana Faugno, the Sexual Assault Nurse Examiner (SANE) with the information she had obtained so far.



Medical Forensic Examination of the Victim

To see the results of the medical forensic examination, [click here](#).

Clothing Collected by the SANE

Diana Faugno, the SANE conducting the examination, collected the victim's clothing that she was wearing at the time of the assault and wore to the hospital (pants, shirt, bra, and underwear). Prior to packaging the clothing, Faugno examined the clothing for signs of force (e.g., stretching, tearing, missing buttons). A [Clothing Documentation Form](#) for Forensic Examiners was used to record this information. Because this type of form is not always used, we offer it as a sample of recommended practice.

The victim also wore sandals to the examination, but these were not collected because Faugno determined (based on the assault history) that they were not likely to contain probative evidence and the victim didn't want to give them up.

Post – Examination Briefing

Following the medical forensic examination, the SANE summarized her findings and advised Deputy Garcia that in addition to penile-vaginal rape, the suspect identified as Tyrone also forced the victim to orally copulate his penis. The suspect identified as Max also forced his fingers in the victim's vagina.

Deputy Garcia asked the SANE, Diana Faugno, whether the victim had any recent consensual sex, to determine whether any DNA reference standards might be needed. Faugno relayed that the victim said she and her boyfriend had sex two days before the assault, and her boyfriend did not use a condom.

Continuing Investigation

Detective Debbie Deloach, the on-call detective, responded to assist Deputy Garcia. The victim contacted her boyfriend, Jerald Ferguson, by phone and he agreed to meet with Deputy Garcia and Detective Deloach at approximately 0130 hours. Ferguson advised Deputy Garcia that Tyrone's last name is Crosby and Max's last name is Verduzco, but he wasn't sure of either individual's home address. Ferguson said he didn't understand why his two friends would sexually assault his girlfriend. He then gave his consent to search his house.

Deputy Garcia completed a crime scene diagram and took photographs of the bedroom where the sexual assault took place. Deputy Garcia didn't see any visible signs of evidence on the bed or in the bedroom. No condoms or packaging were found. The

comforter from the top of the bed where the assault occurred was collected and impounded.

After explaining the importance of a reference standard to exclude his DNA profile, the victim's boyfriend voluntarily agreed to provide Detective Deloach with a buccal swab. Detective Deloach thanked Ferguson for his cooperation and advised the victim of her next investigative steps. She explained that she would contact the victim within the next couple of days to schedule a follow-up interview, after the victim had a chance to rest.

Suspect Examinations

Detective Deloach then returned to the station to conduct computer research to identify both suspects as well as their last known home addresses. Once identified, a criminal history check revealed that Max Verduzco had a number of prior drug-related arrests and Tyrone Crosby had a previous arrest for sexual assault. Detective Deloach also obtained search warrants for complete forensic examinations of both suspects.

To offer an example of what this might look like, a sample [affidavit and search warrant for a suspect examination](#) is provided. For more detailed discussion of these issues, please see our article and associated resources on [Forensic Exams for the Sexual Assault Suspect](#).

Later that morning, Detective Deloach, with assistance from patrol, arrested both suspects at their homes. Deloach advised both suspects of their Miranda rights. Verduzco said Cassi [Jackson] came to the house knowing they were there and that her boyfriend was gone because she wanted to "score some heroin." He said all three "got high" together and then they had consensual sex (a "threesome"). Verduzco said he and Tyrone both wore condoms. Crosby did not make a statement, stating that he wanted a lawyer.

Not Just About Identification

One primary purpose for conducting a suspect examination is to potentially identify the victim's DNA on the suspect's body or clothing. However, this is not the only purpose. The location of the victim's biological material on the suspect's body may establish the specific acts involved in the sexual assault (e.g., penile-vaginal penetration, digital penetration, anal penetration, oral copulation). Alternatively, it may indicate sexual contact more generally. Either way, this type of evidence may be particularly helpful with very young victims, victims who have severe physical or mental disabilities, or victims who are under the influence of drugs or alcohol, because they may not recall or may not be able to articulate exactly what happened to them. Evidence of the victim's DNA on the suspect's body can also be important in cases involving multiple perpetrators, or in

cases where the victim knows that a suspect participated in an assault but is not sure if there was penetration.

Even beyond DNA, a suspect examination can yield documentation of the suspect's clothing, appearance, physical anomalies, tattoos, piercings, and other characteristics. Any of these factors may become important during the course of an investigation and prosecution. If the suspect is identified and located soon after the crime, it can even corroborate information that the victim provides about sensory experiences, such as the suspect's smell (e.g., aftershave, cigarettes, body odor, bad breath).

Evidence from the suspect examination can also provide other types of information that may help to fill in what happened before, during, or after the sexual assault. For example, debris from leaves could be found on the suspect's body that came from the bushes outside the victim's home, or paint chips could remain from the suspect's work earlier in the day. This illustrates the importance of collecting evidence from the crime scene, even if it is not yet clear whether or not it will be probative. Perhaps most important, a thorough suspect examination demonstrates diligence on the part of law enforcement and establishes a critical focus on the suspect – both of which are critical for juries considering the evidence.

One of the most important reasons for conducting a suspect examination, however, *is to document evidence of force, resistance, and injury*. Any time a victim describes a great deal of force during the sexual assault – or when victims state that they bit, kicked, or scratched the suspect – injuries to the suspect might still be identified and documented for days afterward

Follow-Up Interview with Victim

During a follow-up interview with the victim, Detective Deloach asked whether she bought any drugs from either suspect or if any of them took any drugs at the time of the assault. Deloach clarified that she was asking this because one of the suspects raised the issue, and she wanted to make sure she had all the correct information. The detective assured the victim she was not concerned about any illegal drug use on the victim's part, and she was not interested in making an arrest for any such issues. The investigator said her primary concern is investigating the sexual assault, and that it is critical that Jackson is truthful about everything that happened. The victim said she did not take any drugs at the time of the assault; she said the suspects were lying about her coming to the house to buy or do drugs. She said nobody even had any alcohol.

For suspect examinations, as with victims, it is critically important to utilize specially trained forensic examiners. This point is highlighted in many resources, including the [National Protocol for the Sexual Assault Medical Forensic Examinations](#) (2013) and our OnLine Training Institute (OLTI) module entitled, [Sustaining a Coordinated Community Response: Sexual Assault Response and Resource Teams \(SARRTs\)](#).

Evaluating Evidence: An Evolving Situation

In this case, as in most sexual assault cases, the investigator must often select and prioritize what items of biological evidence should be submitted for DNA testing. Given the large number of sexual assault victims who are unable to provide a clear or coherent account of their sexual assault, and the often-complex scenarios these cases present, both investigators and laboratory personnel need to take an evolving view of each case. To illustrate, the laboratory may initially choose to evaluate the evidence from the victim's evidentiary kit, but information revealed during the course of the investigation may shift the focus to a shirt that the victim was wearing. Alternatively, the results from analyzing one source of evidence may prove to be negative, which creates a need to evaluate other sources for potential analysis.

Another possibility is that a longer period of time may have elapsed before the victim's examination than was originally believed. Or no examination may have been conducted at all, either because of the time elapsed since the sexual assault or for other reasons. It is always important to keep in mind that most sexual assaults do not result in a medical forensic examination being conducted with the victim. In these scenarios, the focus may shift to the victim's clothing or other evidence (e.g., condoms, bedding). Similar scenarios can be imagined where samples collected from carpet or car upholstery may take precedence in a particular case.

In other words, investigators should provide as much information as possible to the laboratory, because this serves as a starting point for the analysis. However, the analytical process will then frequently evolve based on the results of laboratory findings as well as additional information and other evidence uncovered during the course of the investigation. Anecdotal case histories can be used to teach investigators and laboratory personnel to be flexible about the possible directions a sexual assault case might take, as probative evidence is sought that will be used to either incriminate or exclude a suspect.

Was the Victim Coherent During the Sexual Assault?

As part of this ongoing process of evaluating evidence, there are a number of critical questions investigators should address. For example, one question is whether or not the victim is able to provide a coherent account of the sexual assault. This includes how many perpetrators might have been involved, what acts took place, and where biological material might be found.

Unfortunately, many sexual assaults involve victims who are severely incapacitated by alcohol or other drugs, or who have little or no recollection for some other reason including the neurobiological impact of trauma. In these scenarios, investigators and criminalists cannot make any assumptions about the events that took place. It is

therefore especially critical for officers and forensic examiners to collect any evidence that *might potentially* be probative.

To illustrate, if the victim does not know whether one or more perpetrators were involved, the laboratory will need to test all probative biological evidence. This may be the only way to make as many identifications as possible. Yet the approach is different when the victim makes a statement that a single perpetrator was involved, in which case the laboratory analysis might be limited to testing a single probative item or stain.

What about Timeframes?

The first training bulletin in this series, [The ABCs of DNA Evidence](#), describes the timeframes for evidence collection, which generally range from 72–120 hours following the sexual assault. When victims have had consensual sex within this same time period, there is a chance that any biological material identified could be the result of the consensual sex act and not the sexual assault. This is also true if the victim engaged in consensual sex after the assault, but before the medical forensic examination. As in our case example, victims should therefore be asked whether they had consensual sex – and the reason for this question must be explained, so they understand that the purpose is to exclude any consensual partner from the investigation and not to undermine the victim's credibility. This question will typically be asked by the forensic examiner, when a medical forensic examination is conducted with the victim, but it is also frequently asked or at least confirmed by the law enforcement investigator as well.

Did the Victim Urinate, Defecate, Bathe, Brush Teeth, or Shower after the Sexual Assault?

It is common for victims of sexual assault to thoroughly bathe or shower after being sexually assaulted. These activities may alter which evidence the investigator and laboratory view as the most likely to be probative. Research suggests that evidence is less likely to be submitted for testing when this occurs (see Patterson & Campbell, 2012), but biological evidence can be recovered from some victims even after showering or bathing. This highlights the importance of encouraging victims to have a medical forensic examination even if they have showered, bathed, douched, etc.

What Clothing was the Victim Wearing at the Time of, and After the Sexual Assault?

In general, the most probative clothing evidence will be whatever the victim wore during as well as immediately after the assault. Yet the clothing worn during or after an assault may not be what the victim wears to the medical forensic examination. Too often, investigators are unsure of what specific clothing was worn during or immediately after the assault, or where this critical evidence might be located. Investigators should therefore work with victims to identify this clothing and take steps to collect it as soon as

possible. It is also important to determine whether the victim left any items of clothing at the suspect's home, or other location where the assault took place. Depending on the circumstances, law enforcement may need to obtain a search warrant to locate and seize such clothing or other evidence.

Were any Protective Measures Taken During the Sexual Assault?

Another critical question is whether measures were taken by the suspect or victim to protect against pregnancy as well as sexually transmitted diseases – or simply to avoid leaving any biological evidence. For example, if a condom was used by the suspect, the likelihood of probative evidence being found on an internal vaginal swab decreases. However, it is still possible. Preejaculate fluid might be recovered from the victim's vaginal swab, if some penile-vaginal contact or penetration took place before the suspect put the condom on. Biological material might also be recovered from other sexual acts not involving the suspect's penis (e.g., cunnilingus or digital penetration).

However, investigators need to treat a victim's statements about condom use with caution, because many victims are unable to accurately provide this information. This is true for a number of reasons, including the traumatic nature of the assault as well as the victim's level of prior sexual experience (e.g., young victims who have not been sexually active or have limited experiences with sexual activity). Victims may not know whether a condom was used, and even if one was used, they may not know whether or not it remained intact. The information a victim provides should therefore be documented and considered as part of the investigation, but evidence collection and analysis should address the possibility that it might not be entirely accurate.

Did the Suspect Ejaculate During the Sexual Assault?

Because the majority of sexual assaults involve a male perpetrator – regardless of whether the victim is female or male – another important consideration is whether ejaculation occurred, and if so, where. As with condom use, however, the victim's statement regarding ejaculation should be treated with caution. If the victim states that the suspect ejaculated, this information should be documented, because it can decrease the time it takes for the laboratory to locate probative evidence.

For example, a female victim might report that the perpetrator penetrated her vagina with his penis, but he then "pulled out" and ejaculated on her blouse. In this particular scenario, the laboratory would focus on the blouse first. However, evidence collection and analysis should also take into account the possibility that the information provided by the victim might not be entirely accurate.

Investigator Assessment

With this information, we now offer a series of questions designed to guide your assessment of the evidence in the case example from the perspective of a law enforcement investigator. For your convenience, you can view or print out a 3–page document with the case example information [here](#).

Is the victim able to provide a narrative account of events?

- No
- Yes
- Unknown

Is there a starting point for the investigation regarding the number of suspects, the identity of the suspect(s), and the specific sexual acts committed?

- No
- Yes
- Unknown

How much time elapsed between the sexual assault and the victim's examination?

- Less than 5 hours
- 5–24 hours (1 day)
- 1–2 days (25–48 hours)
- 3–5 days (49–120 hours)
- More than 5 days (beyond 120 hours)

Does the [SANE report](#) document any non-genital injuries to the victim's body? If so, please briefly describe them in the box below:

Is there any indication (so far) that toxicology analysis will be needed in this case?

- No
- Yes
- Unknown

Requesting Laboratory Services

Based on the information provided so far in this case example, the detective can evaluate the assault history and available evidence to prepare a request for laboratory services. As previously discussed, some jurisdictions test all the items in an evidence kit whereas others limit investigators to a certain number of items for analysis (often 3 or 5). Regardless, it is important to evaluate the information and evidence available to determine which items might be the most likely to yield probative evidence.

As in [Training Bulletin #5](#), we would like you to use the information from this case example to complete a [Sexual Assault Case History and Analysis Form](#). Then, based on this assessment, you can complete one of our sample Laboratory Service Requests: either the one provided in [Excel format](#) or the [Word document](#).

Yet again, we will assist in this process by providing a list to help you to consider all of the available evidence and determine which is most likely to contain probative evidence that will meaningfully advance the investigation.

Please review the list of evidentiary items below and rank them in order from the highest (1) to lowest (5) order of priority for analysis. Not all items will be included in the ranking. Also, keep in mind that there is no single “right answer” to this task.

Medical Forensic Examination of the Victim

- External peri–oral swabs taken from around the mouth (not the lips)
- Oral swabs from inside the mouth
- Fingernail scrapings/swabbings
- Body surface swabs (such as neck, breasts, thighs)
- External genital swabs
- Internal vaginal/cervical swabs
- External anal swabs
- Internal rectal swabs



Victim Clothing (worn at the time of the assault, and to the examination)

- Shirt
- Shorts
- Bra
- Underwear

Forensic Examination of Tyrone Crosby

- External peri-oral swabs taken from around the mouth (not the lips)
- Oral swabs from inside the mouth
- Buccal swabs
- Fingernail scrapings/swabbing's
- Body surface swabs (as indicated by history)
- Swabs from the penile shaft
- Swabs from the scrotum
- Swabs from the perineum
- Foreign material
- Dried secretions
- External anal swabs
- Internal rectal swabs

Forensic Examination of Max Verduzco

- External peri-oral swabs taken from around the mouth (not the lips)
- Oral swabs from inside the mouth
- Buccal swabs (as indicated by history)
- Fingernail scrapings/swabbing's
- Body surface swabs
- Swabs from the penile shaft

- Swabs from the scrotum
- Swabs from the perineum
- Foreign material
- Dried secretions
- External anal swabs
- Internal rectal swabs

Laboratory Findings

As in the previous case example, we offer a completed version of the sample [Sexual Assault Case History](#) and the [Laboratory Service Request](#). You can use these completed versions to compare your responses with ours and learn more about the process.

In this jurisdiction, the laboratory routinely analyzes all of the swabs in the evidence kit from the victim's examination. However, no foreign biological material was detected.

On the other hand, the penile/scrotal swabs from both suspects showed the presence of semen as well as epithelial cells, indicating recent sexual activity. DNA analysis of the semen indicated that each suspect had his own semen on his penile/scrotal swab. More important, DNA analysis of the non-sperm fraction (the epithelial cells) from the penile/scrotal swabs of both suspects indicated that they came from the victim.

The fingernail swabs taken from Verduzco also showed the presence of the victim's epithelial cells.

Below we provide a variety of purposes that could potentially be met with these laboratory results. Please mark the purposes that can already be met, based on the information provided so far.

- Establish sexual contact
- Establish digital penetration
- Corroborate vaginal penetration
- Include suspect(s)
- Exclude suspect(s)
- Link local cases based on DNA developed from forensic evidence



- Corroborate the victim's statements
- Challenge the victim's statements
- Corroborate the suspect's statements
- Challenge the suspect's statements

Evolving Investigative

When the suspects were contacted by law enforcement, Crosby invoked his right to remain silent. However, Verduzco made a statement that Cassi came to the house knowing he and Crosby were there, because she wanted to "score some heroin." He said all three "got high" together, and then they had consensual sex (a "threesome").

At this point the investigative strategy in this case will focus on the issue of consent. Please describe the types of evidence and information that might be used to overcome a consent defense, by helping to establish the presence of force, threat, or fear.

In this case, the SANEs photo documentation and the diagrams of the victim's injuries will be important evidence that will help to support additional investigative steps such as search warrants, as well as any arrest warrants and charging by the county prosecutor. However, there are also other types of evidence that could be collected and documented. This is the focus of our next, and final, training bulletin in this series.

Coming Soon

This next and last training bulletin in our series is entitled: *Overcoming the Consent Defense: The Role of Biological Evidence*. In it, we will address the many ways in which a comprehensive investigation can anticipate this defense and collect pertinent information and evidence to overcome it

For More Information

For more information, please register for our OnLine Training Institute module, [*Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations*](#). Launched in November 2015, this comprehensive module explores the



complex role of DNA in a sexual assault investigation, including the alternative sources of DNA evidence and their potential significance or impact on a sexual assault investigation. A number of resources and tools are provided, along with a series of complex and interactive case examples. It is authored by Sgt. Joanne Archambault, Dr. Kim Lonsway, Dr. Patrick O'Donnell, and Special Agent Lauren Ware.





End Violence Against Women International
(EVAWI)

Role of DNA Evidence in Sexual Assault Investigations

Part 7: Overcoming the Consent Defense: The Role of Biological Evidence

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Dr. Patrick O'Donnell received his Bachelor of Science degree in biology from Santa Clara University in 1982 and his doctoral degree in molecular biology jointly from the University of California, San Diego and San Diego State University in 1988. In November of 1990, he was hired by the San Diego Police Department (SDPD) to design and build a DNA laboratory for the agency. Over 25 years, the SDPD Forensic Biology (DNA) Unit has established a progressive reputation with the latest focus being the implementation of GlobalFiler, using software expert systems to aid in the interpretation of complex DNA mixtures. As of September 2015, the laboratory has a staff of 18 and serves a population of 1.5 million people living within the city limits of San Diego.



Lauren Ware is the Chief of the Forensics and Special Investigative Branch at the Federal Law Enforcement Training Center (FLETC) in Glynco, Georgia. In this position, Ms. Ware leads a staff of 16 forensic instructors who are responsible for researching, designing and delivering the most current, relevant, and accurate forensics and specialized investigative techniques available to federal law enforcement officers. Prior to this, Ms. Ware spent ten years as a special agent with the Air Force Office of Special Investigations (AFOSI) and continues to serve in a reserve capacity. Her formal education includes a bachelor's degree in Physical Anthropology awarded from the University of Hawaii, and a master's degree in Forensic Sciences, with a concentration in crime scene investigation, from George Washington University.



This is the seventh and final training bulletin in our series on DNA evidence, based on the 32-hour OnLine Training Institute (OLTI) module, [Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations](#). The module is co-authored with Dr. Patrick O'Donnell (Supervising Criminalist, San Diego Police Department), and Lauren Ware (Chief of the Forensics and Special Investigative Branch at the Federal Law Enforcement Training Center in Glynco, GA). In this final training bulletin, we focus on the many ways in which DNA and other biological evidence may be useful in sexual assault cases involving the consent defense.

Investigative Strategy: Consent Versus Identity

When suspects are contacted in a sexual assault investigation, they can invoke their right to remain silent and not speak with law enforcement. However, most suspects will talk with an officer when contacted. When the case is a forcible sexual assault, suspect statements tend to fall in three categories.

- Some suspects deny that they had sexual contact (or any contact at all) with the victim: *"I never touched her [or him]! I've never even met her [or him]!"*
- Others state that there has been a misidentification by law enforcement: *"You've got the wrong guy! Someone else might have raped her [or him], but not me."* This response is more likely in cases involving strangers, but it can also be seen in cases where the victim and suspect know each other.
- Most often, however, suspects acknowledge that the sexual activity took place, but state that it was consensual. *"Yeah, we had sex, but she [he] wanted it."*

Other defenses are seen, however, in different types of sexual assault – for example, based on the victim's age, incapacitation due to drugs or alcohol, or severe disability.

While this captures the essence of most suspect responses in a forcible sexual assault investigation, it is not always this simple. It is in fact difficult to pigeonhole these complex cases, and suspect statements will frequently evolve over time. Investigators should therefore strategize their investigation around specific statements made by the victim and suspect yet remain flexible and document evidence that can address the possibility of alternative statements and evolving defense strategies.

In this training bulletin, we focus primarily on the role of biological evidence in the investigation of a forcible sexual assault, where the defense is likely to be consent. For detailed information on other factors in these investigations, please see OLTI modules such as: [Law and Investigative Strategy: What Kind of Sexual Assault is This?](#), [Interviewing the Victim: Techniques Based on the Realistic Dynamics of Sexual Assault](#), and [Effective Report Writing: Using the Language of Non-Consensual Sex](#).

How DNA Evidence May Prompt a Consent Defense

One key purpose of DNA evidence in a sexual assault case is to establish that a sexual act took place (and identify the suspect involved). This is particularly critical when the suspect denies committing the act. For example, in one of the cases featured in [Training Bulletin #5](#), a young female victim was sexually assaulted by her (adult male) soccer coach. He denied having any sexual contact with the girl, which should be expected based on his position as her coach and the fact that he was married. When the detective requested that the laboratory analyze the victim's underwear, the suspect's DNA was identified, which established the legal element of sexual contact.

At this point, the soccer coach is likely to change his statement, from denying that the sexual act took place to admitting it, but saying the victim consented. DNA often prompts such changes in suspect statements. While he still risks losing his marriage and coaching position with a conviction for statutory rape, the sentence is far more lenient than it would be for forcible rape, which would likely involve time in prison.

Since DNA evidence can now reliably establish the identity of the suspect in so many cases, it is less common for suspects in a sexual assault case to deny the sexual acts or state that law enforcement identified the wrong person. Suspects are now extremely likely to say that the victim consented to the sexual acts, even in cases where the suspect was a stranger, committed other crimes (such as a home invasion), used a weapon, perpetrated severe physical violence, and/or significantly injured the victim.

Not Just for Strangers

Historically, some investigators only used DNA evidence in cases of stranger sexual assault, rather than non-strangers. One police official explained this logic:

We don't need the DNA test when we know who the suspect is already without it. It would be a waste of everyone's time and money (Human Rights Watch, 2010, p. 32).

Yet this perspective fails to recognize the many purposes of DNA in the majority of sexual assault cases where the victim and suspect know each other. As highlighted throughout these training bulletins, DNA is not only used to identify a suspect but also to link cases together and corroborate the victim's and/or suspect's statements. Our recommendation is therefore to expand the use of DNA *regardless of whether the victim and suspect know each other, and even when the consent defense is raised.*

A prosecutor quoted in a Human Rights Watch report emphasized how important corroborative evidence can be, by describing a situation where this was needed but not available, because of an oversight during the medical forensic examination:

The victim claimed that the suspect had ejaculated in her belly button [but] the suspect ... denied ejaculating in the victim's belly button. I had hoped to test a swab taken from the victim's belly button in order to back up the victim's version of events and discredit the suspect at trial... [but] the laboratory informed me that the doctor had not swabbed the victim's belly button ... it was incredibly frustrating to move forward without crucial evidence (Human Rights Watch, 2010, p. 29).

This anecdote also illustrates the need for feedback to forensic examiners, because otherwise they have no way to know when they might need to modify their practices.

Consent Defense: “She [he] Wanted It”

In cases of forcible sexual assault, where the suspect and victim know each other, a consent defense is very likely to be raised. In other words, the suspect acknowledges the sexual activity but states that the victim consented. In this scenario, the investigation must focus primarily on any evidence that force, threat, or fear was present. This will likely include the following:

- Evidence of physical or verbal resistance on the part of the victim
- Evidence of genital or nongenital injury
- Evidence of any factors that heightened the victim's vulnerability
- A detailed account of the victim's thoughts and feelings during the sexual assault
- Information regarding the suspect's (vs. the victim's) size and strength
- Information about the environment in which the assault took place (e.g., isolation)
- Information about the victim's post-assault behavior, including indicators of stress

Information that is consistent between the victim's and suspect's description of events can also be helpful, by demonstrating that the victim and suspect describe the events in a similar way, with the only difference being whether or not the victim consented to the sexual act(s). However, keep in mind that *the absence of injury or physical resistance* by the victim cannot be used as proof of consent.

Using Biological Evidence to Corroborate Statements

In cases where the consent defense may come into play, DNA can be used to corroborate – or call into question – statements made by both parties. To illustrate, a female victim may state that the suspect licked or kissed her breasts. If a forensic examiner swabs this area and recovers saliva that is later identified as being the suspect's, this will not necessarily establish an element of a criminal offense – but it may corroborate the victim's account of events.

Alternatively, the suspect and victim may provide different accounts of the specific acts committed, and biological evidence could help lend credibility to one version or the other. It is therefore critical for investigators to obtain a detailed account of the sexual acts from the victim and suspect (whenever possible) and focus attention on the evidence collected from areas where their statements diverge.

Ultimately, evidence to establish force, threat, or fear is needed to overcome the consent defense. Sometimes biological evidence such as blood from an injury can help to corroborate this element, but it is more likely to be established with other forms of evidence such as non-genital injuries or testimony by the victim or witnesses (including forensic examiners).

Encourage Victim Access to Medical Forensic Exams

Thanks to provisions of the Violence Against Women Act (VAWA), all victims of sexual assault have the right to a medical forensic examination free of charge, and regardless of whether or not they ultimately decide to participate in the criminal justice process. Yet some have questioned whether an examination should be conducted in cases where the victim and suspect know each other. This argument is typically based on two premises:

1. The process of collecting evidence from the victim is traumatic, and
2. Any evidence collected will be irrelevant because the suspect will most likely admit to the sexual acts but argue that the victim consented.



Photo Credit: Debra Holbrook

To respond to the second issue, we have already outlined the many purposes that can be met with a medical forensic examination in cases involving a consent defense.

With respect to the first point, however, some have simply argued that it is not our place as professionals to decide what is “too traumatic” for victims. Professionals working in this field can certainly strive to be compassionate and reduce unnecessary trauma experienced by victims. Yet many

victims are not only *able* to withstand the process of a medical forensic examination – they are *highly motivated* to do so, in the hopes of holding their assailant accountable. Many victims also want to believe that they “did something” to address the injustice that was done to them and to prevent future assaults on others – even if their own case does not result in a successful prosecution.

These points were eloquently articulated by Amy Pollpeter of the Iowa Division of Criminal Investigation, who concluded:

It should always be a victim's choice of whether having the kit collected is too traumatic for them – if so, then they have the right to refuse the kit and just get a medical exam, or just seek advocacy services. We should never be in the business of deciding what a victim can handle.

More important, victims benefit in a variety of other ways from participating in the examination, by having their physical health checked and medical needs met (e.g., prophylaxis for sexually transmitted infections, emergency contraception), as well as connecting them with other resources. It is therefore incumbent upon communities to ensure that victims have the information and support (e.g., victim advocacy) they need to access a medical forensic examination by a specially trained health care provider.

Look Beyond the Obvious: Clothing, Suspect Exams, Etc.

When collecting or reviewing evidence in a sexual assault case, police, prosecutors, and health care providers must be trained to look for anything that could be relevant in a consent defense. For instance, instead of looking at blood only as a way to identify a suspect, blood might also corroborate injuries sustained by the victim or suspect during a struggle. Although hair is commonly thought of as trace evidence that can be sometimes by used to identify a suspect, hair can also be establish force if for example it has been pulled out of a person's head.

Clothing can also be valuable, but all too often it is collected without being carefully examined for the type of evidence that might corroborate the element of force – for example, rips, stretched-out elastic, missing buttons, blood, and dirt stains. Sometimes this is not done because the professional collecting the clothing is afraid of disturbing any possible trace evidence. However, trace evidence is rarely used in sexual assault cases, and DNA is remarkably stable under most conditions. Therefore, both the victim's and suspect's clothing, if available, should be carefully examined and any visible signs corroborating the use of force or resistance should be documented.

As described in previous training bulletins in this series, a suspect examination can also be a valuable part of a thorough investigation. In the majority of sexual assault cases where consent is going to be the primary issue, any evidence that corroborates the victim's or suspect's account and documents force or injury is absolutely critical.

After the investigation is completed (e.g., the evidence is collected, and interviews are conducted with victims, witness, and suspects), law enforcement must clearly communicate with laboratory personnel to highlight relevant aspects of the case history. This will include indicating whether consent or identify is the issue in a particular case.

For more information on evidence from victim and suspect examinations, articles of clothing, and the crime scene, please see Training Bulletin #6 in this series, [Considering Multiple Sources of DNA: Victim and Suspect Forensic Exams, Clothing, and Crime Scenes](#). For details on how to communicate effectively with laboratory personnel, please see Training Bulletin #4, [Making the Most of Biological Evidence](#).

Value for Prosecutorial Strategy

Beyond the many advantages of forensic DNA during the course of a sexual assault investigation, it is also extremely valuable for prosecution, even in cases with a consent defense. To highlight this point, Assistant County Attorney Jeff Noble of Polk County, Iowa, characterizes the argument that can be made by defense counsel, to persuade defendants to plead guilty without a trial when there is DNA evidence:



Look, you admitted you did it. The DNA shows you did it. The victim says you did it. You can say consent, but if they don't believe you on that one issue, we lose.

Noble noted that such cases do not often go to trial, but he attributes that in no small part to the DNA results themselves. In some cases, he argues that it is the DNA that “gets” the admission of consent.

Having DNA in these cases can also provide investigators with a strategy for conducting the suspect interview. Without revealing information about the forensic evidence to the suspect, the investigator may provide the opportunity for the suspect to deny any sexual contact with the victim. At that point, the suspect is locked into a statement, which will be more difficult to defend later and used to establish inconsistencies that may challenge the defendant’s credibility in court.

Noble also pointed out that DNA evidence is often used by prosecutors to force the suspect into testifying. He illustrated this point by noting that a defendant does not have to take the stand and face cross-examination. However, if the prosecutor introduces only the victim’s testimony and the DNA results, the defendant will need to take the stand to assert the consent defense. This opens the defendant to cross-examination by the prosecutor.

A third reason is simply to convey that investigators and prosecutors have taken all possible steps to overcome the reasonable doubt that may stem from such an omission. Noble articulates the argument that can be made by the defense if DNA analysis is not conducted:

With the obligation to present this case beyond a reasonable doubt, what did the state do? They took this victim at her word! They didn't even test the DNA! ... They want to label this poor young man a sex offender for the rest of his life and they didn't even test the swabs!

DNA results can be used to preclude such an argument and focus on the critical question of consent.

The Limits of Biological Evidence

As we highlighted throughout these training bulletins, and the OLT module from which they are drawn, DNA alone will rarely be sufficient to overcome the consent defense raised in the vast majority of sexual assault cases. However, it is certainly valuable evidence, and it can often help to advance the investigation and prosecution of sexual assault. Yet, DNA will never be a “magic bullet” that somehow guarantees a successful investigation and prosecution. Only a fair, thorough and professional investigation will have the desired impact. For the sake of transparency, it is important that this point is explained to victims by forensic examiners and advocates, as well as officers and investigators.

Conclusion

We hope this training bulletin series on DNA and other biological evidence has provided helpful information, tools, and resources for sexual assault investigations. The complete [set of training bulletins](#) is available on our website, along with the OnLine Training Institute module from which they were drawn: [Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations](#). Please see these additional resources for more valuable information on this critically important topic.

Reference

Human Rights Watch (2010). [“I Used to Think the Law Would Protect Me:” Illinois’ Failure to Test Rape Kits](#). New York, NY: Human Rights Watch.