



## IN-BRIEF SERIES (Part 1 of 3)

# Beyond DNA: The Role of Physical Evidence in Sexual Assault Investigations



“Based on our findings, jurors were more likely to find a defendant guilty than not guilty even without scientific evidence if the victim or other witnesses testified, **except in the case of rape.**”

—Honorable Donald E. Shelton,  
*The 'CSI Effect': Does It Really Exist?*, National  
Institute of Justice (NIJ)

### Preface

Sexual assault remains prevalent in the United States, with an average of 300,000 cases reported to law enforcement each year [1]. However, another 600,000 go unreported [2]. The circumstances of and trauma resulting from a sexual assault can pose a challenge to investigators. For example, witnesses are not always present; the impact of trauma or incapacitating substances, such as alcohol, may affect the victim’s ability to recount details of the incident; and frequently, corroborating evidence is limited.

DNA evidence, while valuable, is not always probative or present in every case: many DNA samples do not meet the quality standards required to be uploaded into CODIS (38% of profiles were found to be ineligible as noted from recent NIJ-supported research [3]). Even in cases where a DNA profile is present and is CODIS-eligible, a CODIS hit occurs only about half of the time [3]. Additionally, a DNA profile may provide limited probative value in situations where sexual contact is not disputed. Thus, many types of additional physical evidence play a critical role in the investigation and prosecution of sexual assault cases.

Physical evidence collection, submission, and analysis can be an effective and necessary means of reconstructing at least some of the events that occurred during a sexual assault. Physical evidence provides value to investigations even if a DNA profile is developed and probative, as it can be used to corroborate and supplement a greater understanding of the circumstance and make a stronger case. This three-part Beyond DNA In-Brief series highlights types of physical evidence that can provide crucial information about a sexual assault, so that key stakeholders in the criminal justice community ultimately obtain just resolutions for these crimes.

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### Objectives

- ▶ To highlight the role physical evidence plays in sexual assault investigations beyond DNA analysis.
- ▶ To identify the types of physical evidence that play a role in sexual assault investigations.

These reports are designed to provide **law enforcement, policymakers, legal professionals, and the public** with an introduction to various types of physical evidence and the roles they may play in sexual assault investigations with surviving victim(s).

This is the first installment of a three-part series, which also includes (2) *Beyond DNA: The Role of Biological Evidence in Sexual Assault Investigations* and (3) *Beyond DNA: The Role of Toxicological Evidence in Sexual Assault Investigations*.



## Introduction

The availability of conclusive and reliable DNA evidence in sexual assault cases is often viewed as a critical factor in investigative and prosecutorial decisions [4]. However, DNA is not always present or probative in these cases. Pursuing and highlighting the importance of all evidence can establish the facts of the case, helping to bring justice to victims, safety to communities, and accountability to offenders. The discussion below will briefly summarize the significant role physical and other evidence can play in sexual assault investigations and prosecutions.

## Types of Physical Evidence

Sexual assault cases require thorough investigations, collaboration with medical and other professional experts, and understanding of the law, victim behavior, and scientific and social science research related to accurate assessment [5]. A sexual assault case will rarely rely on a single piece of evidence. Instead, various pieces of evidence, including testimony and physical evidence that are identified and admitted work together to demonstrate the totality of the circumstances and establish the elements of the crime.

Physical evidence, both DNA and non-DNA, provides important information for the successful investigation and prosecution strategies. Physical evidence may include the following:

- ▶ Physical injuries such as bruising and lacerations
- ▶ Toxicology
- ▶ Digital evidence such as text messages, emails and cellphone records
- ▶ The identification of biological fluids such as saliva and semen
- ▶ DNA
- ▶ Impression evidence (e.g., fingerprints, shoeprints)
- ▶ Trace evidence (e.g., hairs, fibers)
- ▶ Other physical evidence (e.g., bedding and clothing).

The effective collection of physical evidence from the victim, the suspect, or wearable items should be conducted by trained personnel such as sexual assault nurse examiners (SANEs). SANEs are more likely than other untrained medical professionals to complete a chain of custody, properly seal individual specimen

envelopes, and collect appropriate swabs and amounts of head and pubic hair [6]. Coordinating the investigation and prosecution of sexual assault can also be challenging to ensure efficient and effective case processing.

### Resources for Sexual Assault Response Teams

- The National Institute of Justice's [National Best Practices for Sexual Assault Practices: A Multidisciplinary Approach](#) provides 35 recommendations to improve evidence collection and tracking procedures, investigative considerations, communication strategies, and more [7].
- The Forensic Technology Center of Excellence (FTCoE) published a [comprehensive report](#) on current knowledge and best practices for sexual assault response teams, including considerations for evidence collection [8].
- The [Sexual Assault Kit Initiative](#) (SAKI) provides resources on these issues, including insight for cold cases where DNA may not be dispositive [9].
- The NIJ introduces the value of physical evidence in [Sexual Assault Cases: Exploring the Importance of Non-DNA Forensic Evidence](#). The NIJ has also published a variety of resources around [sexual assault response](#) [10].
- The FTCoE has collaborated with the Center for Nursing Excellence (CFNEI) to develop [an online sexual assault glossary](#) to standardize language amongst medical, law enforcement, and legal professionals [11].

## Impact of Physical Evidence on the Criminal Case

In sexual assault cases, juror expectations related to evidence, victim behavior, and perpetrator characteristics may not align with the reality of these crimes. Expectations may also run counter to the law itself, which in most jurisdictions permits sexual assault cases to be established through the testimony, if believed, of victims alone [12]. As a result, investigators and prosecutors must identify and connect all available physical evidence that directly and indirectly identifies the perpetrator and establishes the elements of a crime. In any case, the investigation should proceed in alignment with [A National Protocol for Sexual Assault Medical Forensic Examinations](#), which covers a wide range of issues relating to the examination process,



including the use of trained personnel to collect and preserve evidence [13]. This section will briefly go into more detail on a few of the types of evidence that can provide unique value in sexual assault cases beyond DNA, including:

- ▶ Physical injury
- ▶ Toxicology
- ▶ Digital evidence
- ▶ Other physical evidence.

### Physical Injury

Physical injury is often expected in sexual assault cases but is not present in every case [14,15,16]. A meta-analysis studying the impact of medicolegal evidence in sexual assault cases indicated that bodily injury was documented in around 65% of sexual assault cases, and genital injury around 30% of the time [17]. Where it is present, victims may minimize or overlook their own injuries. Thus, a thorough physical examination by a trained SANE is critical to uncovering important evidence that even the victim may have overlooked. While the primary focus is on treating the patient, a sexual assault examination may reveal important evidence. For example, examining a victim’s genitalia or mouth may reveal abrasions or lacerations, consistent with the victim’s report of penetration or blunt force trauma. Although these observations alone do not indicate that penetration was nonconsensual or obtained through force, they can corroborate both victim and suspect testimony, providing a greater understanding of the events transpiring during the incident.

Injuries can also corroborate the manner of the assault. For example, bruises, wounds, abrasions, or friction burns may be consistent with being assaulted on a particular surface or being dragged. Bite marks may indicate that the perpetrator bit the victim or that the victim tried to free themselves from bondage. Marks along a victim’s back or front can be corroborative of the victim’s position or the type of surface where the assault occurred. A sexual assault examination can also reveal evidence that supports the victim’s identification or description of the crime scene. For example, trace evidence, such as grass, sand, fiber, gravel, and other items, can be recovered from the victim’s person or clothing to establish a link between the victim and the crime scene.

Strangulation, which is present in some sexual assaults [18], may also leave injuries, such as external bruising in the neck area or petechiae in the eyes or mouth, redness around the neck [19]. It is important to recognize, however, that the absence of visible injury is not dispositive evidence for whether a strangulation occurred; indeed, strangulation may leave minimal or no external injuries or symptoms [19]. Medical observations of the victim’s voice (e.g., whether it is hoarse), law enforcement documentation of victim behavior on the scene (e.g., if the victim was “hysterical” or “excited”) [18], and even wounds to the perpetrator (e.g., defensive wounds to their hands or face) may provide physical evidence of a violent struggle.

### Toxicology

Universal toxicology screens of patients reporting sexual assault are not recommended in sexual assault examinations [13]. However, where appropriate and available, toxicological evidence can help establish a victim’s level of intoxication and the presence of a narcotic or other substance a perpetrator may have used surreptitiously to incapacitate the victim – also referred to as drug facilitated sexual assault (DFSA). Toxicology screens can also be used in cases where the victim voluntarily ingested drugs and alcohol. Even when positive toxicology results are not available, toxicologists can testify about the impact of alcohol on physical and cognitive capacity and may even be able to opine about the presence of a narcotic based on the victim’s report of the physiological sensations and conditions they experienced.

*Beyond DNA: The Impact of Toxicological Evidence in Sexual Assault Investigations*, discusses the use of toxicology in sexual assault cases in more detail.

### Digital Evidence

As various technologies – such as fitness trackers, third-party applications for mobile phones, and smart home devices – become more and more pervasive in our modern society, it is becoming increasingly critical to examine data from devices used by defendants, victims, or relevant third parties for evidence. Digital evidence can reveal admissions from the defendant, link the defendant and the victim, and provide corroborative or exculpatory evidence [20]. Digital evidence may include, but is certainly not limited to,

The NIJ funds research on digital evidence and has published [multiple articles](#) in this forensic discipline.



text communications (both short message service [SMS] and multimedia messaging service [MMS]), photographs, fitness or smart watch trackers, and social media. Like other types of evidence, digital evidence can corroborate or refute accounts of both victims and suspects. Information from these devices can help establish a timeline of events that had transpired, help understand the possible relationship between victims and suspects, place individuals at the scene of the crime, and establish a possible motive.

The technological capacity to forensically examine such evidence is constantly evolving, so a careful investigation should assume that what could not be examined in the past may now be testable [21]. The data from these technologies can provide key evidence into events and communications of relevant criminal investigations; this evidence likely would have been undiscoverable prior to the invention and widespread availability of such technologies.

### Other Physical Evidence

Other types of physical evidence beyond DNA may include biological, trace, and impression evidence, which can provide important support for a victim's testimony.

This may include biological, trace, and impression evidence, as well as firearms and other weapons, that may be found at the scene, on the victim(s), or on the suspect(s). For example, physical items such as bedding may carry important biological evidence but can also corroborate a victim's description of the sheets or comforter on which the assault occurred and establish an important link between the factfinder and the victim's experience of the assault. If a victim focused on a unique item or object from the crime scene, recovering or photographing that item to show to the victim during testimony can recreate the reality of the crime for the factfinder and provide victims with additional opportunities to offer compelling testimony about their assault or to explain a particular aspect of it.

Biological evidence is commonly collected in cases of sexual assault. Consult *Beyond DNA: The Role of Biological Evidence in Sexual Assault Investigations* for more information.

### Limitations of Availability of Evidence

While providing significant value to a sexual assault case, physical evidence may not always be available in all situations. Delayed reporting is a common and persistent

challenge when investigating and prosecuting sexual violence. Research has confirmed the frequency of delayed reports in sexual violence cases and the understandable causes of such delays [22]. Unfortunately, delays in reporting can negatively impact the availability and condition of relevant evidence; indeed, evidence may be lost or destroyed with the passage of time. Further, given factfinders' expectations, prosecutors must also address and provide explanations for the absence of evidence and educate the jury that such absences do not disprove the occurrence of a crime. They must emphasize that the absence of physical evidence (e.g., genital injury) does not negate the culpability of the perpetrator or the credibility of the victim. The uniquely negative impact of missing physical and, in particular, scientific evidence has been documented in sexual violence cases [23]. Thus, prosecutors must be prepared to effectively introduce *all* available evidence that supports the elements of the crime against the victim.

Prosecutors can anticipate and prepare for these limitations and legal challenges prior to and during trial. Strategies include educating judges and juries on the varied responses to sexual violence that victims may experience through jury selection and other testimony, including experts [24]. If jurors understand how the delay itself may be related to the trauma of the crime, they will appreciate how the evidence of delayed reporting and absence of other physical evidence can corroborate the victim's testimony of being sexually assaulted. However, when preparing for expert testimony, prosecutors should work closely with the experts to ensure they are aware of the allowable scope of their testimony under the law, as overstepping these may lead to mistrials or overturned convictions [25].

### Conclusion

No single piece of evidence is as important as all the evidence taken together to support and corroborate a victim's disclosure of sexual assault. Investigating and introducing the various types of evidence at trial individually and collectively can break down the barriers to justice that threaten a prosecutor's ability to provide victims and communities with safety and justice and hold offenders accountable. Looking beyond DNA to other types of physical evidence, such as toxicological and biological evidence, can help achieve this goal.



## About AEquitas

This resource was authored by Jennifer Gentile Long, JD; Charlene Whitman-Barr, JD (previously an AEquitas Senior Associate Attorney Advisor and now at D.C. Legal Aid); and Jonathan Kurland, JD of AEquitas. [AEquitas](#) is a collaborative resource center for prosecutors involved in gender-based violence and human trafficking cases. This work was supported by Grant No. 2016-TA-AX-K020 awarded by the U.S. Department of Justice, Office on Violence Against Women (OVW). The opinions, findings, conclusions, and recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of OVW.

### About AEquitas

AEquitas is a nonprofit organization focused on developing, evaluating, and refining prosecution practices related to gender-based violence and human trafficking. We're a team of former prosecutors with decades of experience, working globally to hold offenders accountable and promote victim safety.

## Resources

1. Morgan, R. E., & Kena, G. (2017, December). *Criminal victimization, 2016*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Retrieved from <https://www.bjs.gov/content/pub/pdf/cv16.pdf>
2. Rape, Abuse & Incest National Network. (2018). The criminal justice system: Statistics. Retrieved from <https://www.rainn.org/statistics/criminal-justice-system>
3. Waltke, H., LaPorte, G., Weiss, D., Schwarting, D., Nguyen, M., & Scott, F. (2017). Sexual Assault Cases: Exploring the Importance of Non-DNA Forensic Evidence. *National Institute of Justice Journal*, 279.
4. Shelton, D.E., Kim, Y.S., & Barak, G. (2006). A Study of Juror Expectations and Demands Concerning Scientific Evidence: Does the 'CSI Effect' Exist? *Journal of Entertainment and Technology Law*, 9(2), 331-368.
5. The Justice Management Institute, Urban Institute, and AEquitas. (2018). Model response to sexual violence for prosecutors (RSVP): An invitation to lead. Washington, DC: Aequitas. <https://box.sve.mybluehost.me/wp-content/uploads/2018/09/Model-Response-to-Sexual-Violence-for-Prosecutors-RSVP-An-Invitation-to-Lead.pdf>
6. Sievers, V., Murphy, S., & Miller, J. J. (2003). Sexual assault evidence collection more accurate when completed by sexual assault nurse examiners: Colorado's experience. *Journal of Emergency Nursing*, 29(6), 511-514.
7. National Institute of Justice(2017). *National Best practices for Sexual Assault Kits: A Multidisciplinary Approach*. Retrieved from <https://www.ncjrs.gov/pdffiles1/nij/250384.pdf>
8. FTCoe. (2014). *Organizing and transferring SANE/SAFE/SART knowledge and best practices*. U.S. Department of Justice, NIJ, Office of Investigative and Forensic Sciences. Retrieved from <https://forensiccoe.org/workshop/sane-safe-sart-knowledge-and-best-practices/>
9. SAKI: Sexual Assault Kit Initiative. (n.d.). Resolving cases without DNA. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance. Retrieved from <https://www.sakitta.org/toolkit/index.cfm?fuseaction=topic&topic=31>.
10. Heather Waltke, Gerald LaPorte, Danielle Weiss, Dawn Schwarting, Minh Nguyen, and Frances Scott, "Sexual Assault Cases: Exploring the Importance of Non-DNA Forensic Evidence," *NIJ Journal* 279, April 2018, <https://nij.gov/journals/279/Pages/non-dna-evidence-in-sexual-assault-cases.aspx>
11. <https://www.cfnei.com/glossary-index/>



## Resources (continued)

12. Gulbis, V. M. (1984). Modern status of rule regarding necessity for corroboration of victim's testimony in prosecution for sexual offense. *American Law Reports*, 31(4), 120–156
13. U.S. Department of Justice, OVW. (2013). *A national protocol for sexual assault medical forensic examinations: Adults/adolescents (Second Edition)*. Retrieved from <https://www.ncjrs.gov/pdffiles1/ovw/241903.pdf>
14. Sommers, M. S. (2007). Defining patterns of genital injury from sexual assault: A review. *Trauma, Violence, & Abuse*, 8(3), 270–280.
15. Marilyn Sawyer Sommers, et al, Injury Patterns in Women Resulting from Sexual Assault, 2(3) *Trauma, Violence, and Abuse* 240-58 (2001).
16. Ledray, L.E. "The National Sexual Assault Database: Can it Help You?" (2005). *Journal of Forensic Nursing*, 1(1):36.
17. Du Mont, Janice, World Health Organization, White, Deborah & Sexual Violence Research Initiative. (2007). The uses and impacts of medico-legal evidence in sexual assault cases: a global review / Janice Du Mont, Deborah White. Geneva: World Health Organization. <http://www.who.int/iris/handle/10665/43795>
18. Training Institute on Strangulation Prevention & California District Attorneys Association. (2013). The investigation and prosecution of strangulation cases. Retrieved from <https://www.familyjusticecenter.org/wp-content/uploads/2017/11/The-Investigation-and-Prosecution-of-Strangulation-Cases-Manual-2013.pdf>
19. Funk, M., & Schuppel, J. (2003). Strangulation injuries. *Wisconsin Medical Journal*, 102(3), 41–45.
20. Anderson, J. (2017, November 28). #Guilty: Identifying, preserving, and presenting digital evidence [Video file]. Available at <https://aequitasresource.org/resources/>
21. Brewster, T. (2018, February 26). The Feds can now (probably) unlock every iPhone model in existence – Updated. *Forbes*. Retrieved from <https://www.forbes.com/sites/thomasbrewster/2018/02/26/government-can-access-any-apple-iphone-cellebrite/#4ff40094667a>; Cheng, R. (2018, March 7).
22. Bunting, L. A. (2014). Exploring the influence of reporting delay on criminal justice outcomes: Comparing child and adult reporters of childhood sexual abuse. *Journal of Child Sexual Abuse*, 23, 577–594
23. Selton, D. E. (2008). The 'CSI Effect': Does it really exist? *NIJ Journal*, 259. Retrieved from <https://www.nij.gov/journals/259/pages/csi-effect.aspx>
24. Mallios, C., & Meisner, T. (2010). Educating juries in sexual assault cases part i: Using voir dire to eliminate jury bias. *Strategies*, 2010(6). Retrieved from <https://box.sve.mybluehost.me/wp-content/uploads/2018/09/EducatingJuriesInSexualAssaultCasesPart1.pdf>
25. Long, J. G. (2007). Introducing expert testimony to explain victim behavior in sexual and domestic violence prosecutions. Retrieved from [https://ndaa.org/wp-content/uploads/pub\\_introducing\\_expert\\_testimony1.pdf](https://ndaa.org/wp-content/uploads/pub_introducing_expert_testimony1.pdf).

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