



Strengthening the Chain of Custody in Toxicological Evidence: A Critical Analysis under India's New Criminal Laws

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Abstract

The evidentiary value of a toxicological finding is only as strong as the chain of custody that connects the biological sample analysed in the laboratory to the sample originally collected from the body of the victim, the accused, or the crime scene. Any unexplained gap in that chain—delay, defective sealing, mismatched documentation, or unauthorised handling—invites the inference that the sample analysed may not be the sample seized, undermining the entire evidentiary edifice built upon it. India's new criminal-law trilogy—the Bharatiya Nyaya Sanhita, 2023 (BNS), the Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS), and the Bharatiya Sakshya Adhiniyam, 2023 (BSA), all in force since 1 July 2024—introduces, for the first time, express statutory language addressing forensic investigation, custody chronology, and expert certification. This paper critically examines whether these reforms meaningfully strengthen the chain of custody specifically for toxicological evidence, drawing on the jurisprudence developed under the Narcotic Drugs and Psychotropic Substances Act, 1985, the Supreme Court's decisions in *Mohan Lal v. State of Punjab*, *Tomaso Bruno v. State of Uttar Pradesh*, and *Anvar P.V. v. P.K. Basheer*, and empirical evidence of delay and documentation failure in

India's forensic science laboratories. It concludes that while the new laws formalise obligations that were previously matters of practice and precedent alone, they do not resolve the underlying infrastructural deficits that have historically produced custody breaks, and proposes a set of institutional and procedural reforms to close that gap.

Keywords: chain of custody, forensic toxicology, Bharatiya Nagarik Suraksha Sanhita, Bharatiya Sakshya Adhiniyam, viscera, NDPS Act, forensic science laboratory, admissibility

1. Introduction

Chain of custody refers to the chronological documentation that records the seizure, custody, control, transfer, analysis, and disposition of physical or biological evidence. In toxicological cases—whether a suspected poisoning death, a drug-facilitated crime, or a narcotics offence—the chain typically begins with the collection of viscera, blood, urine, or other biological material at the scene, hospital, or mortuary, continues through sealing, labelling, and transportation, and culminates in laboratory analysis and, eventually, courtroom



testimony. Because toxicological findings are frequently the central, and sometimes the only, scientific evidence establishing an element of the offence, any break in this chain that raises a reasonable possibility of substitution, contamination, or tampering can be fatal to the prosecution's case, regardless of how sound the underlying chemical analysis may be.

India's criminal justice system has historically addressed chain-of-custody requirements primarily through judicial interpretation rather than comprehensive statutory codification—most notably in narcotics jurisprudence under the Narcotic Drugs and Psychotropic Substances Act, 1985 (NDPS Act), where the severity of mandatory minimum sentences has driven courts to develop an unusually rigorous body of custody doctrine. The replacement of the Indian Penal Code, 1860, the Code of Criminal Procedure, 1973, and the Indian Evidence Act, 1872 with the Bharatiya Nyaya Sanhita, 2023, the Bharatiya Nagarik Suraksha Sanhita, 2023, and the Bharatiya Sakshya Adhiniyam, 2023, respectively, with effect from 1 July 2024, offered an opportunity to codify chain-of-custody obligations more comprehensively and to extend the rigour previously confined to narcotics cases to toxicological evidence generally. This paper evaluates how far that opportunity has been realised, and where gaps remain.

2. The Doctrinal Foundations of Chain-of-Custody Requirements in India

2.1 The general principle: circumstantial and scientific evidence must form an unbroken chain

The Supreme Court's decision in *Tomaso Bruno v. State of Uttar Pradesh* (2015) reaffirmed the longstanding principle governing cases built on circumstantial and scientific evidence: the circumstances relied upon by the prosecution must be proved by reliable and cogent evidence, and all links in the chain of circumstance must be complete so as to exclude the possibility of the accused's innocence. In that case, the prosecution's failure to produce available CCTV footage, combined with unresolved questions about the medical evidence on cause of death, led the Court to set aside a murder conviction, holding that gaps in the evidentiary chain left hypotheses consistent with innocence unexcluded. While *Tomaso Bruno* did not concern toxicological evidence specifically, its articulation of the "unbroken chain" requirement, and its insistence that the prosecution produce the best available scientific evidence, has been treated by subsequent commentary as a foundational statement of India's chain-of-custody doctrine applicable across categories of scientific proof, including forensic toxicology.

2.2 The NDPS crucible: chain-of-custody doctrine at its most exacting

The most developed body of Indian chain-of-custody jurisprudence has emerged from narcotics prosecutions, where the combination of mandatory minimum sentences and the ease with which small quantities of contraband can be manipulated has led courts to police the custody chain with particular rigour. In *Mohan Lal v. State of Punjab* (2018), the Supreme Court held that an investigating officer's retention of seized contraband and samples in private custody—rather than depositing them in the designated malkhana (evidence storeroom)—combined with the absence of contemporaneous police-diary entries, constituted a serious procedural lapse implicating the constitutional guarantee of a fair investigation under Article 21. The Court further held that the position taken by the High Court, that Section 55 of the NDPS Act authorised the investigating officer to keep seized property and samples in his own safe custody, was erroneous. In the companion line of authority beginning with *Union of India v. Mohanlal* (2016), the Supreme Court clarified that sampling under Section 52A of the NDPS Act must occur in the presence of, and under the certification of, a magistrate—a requirement subsequently invoked by High Courts to set aside convictions where sampling was conducted unilaterally by the seizing officer.



Analysis of subsequent NDPS case law shows a consistent pattern: courts have acquitted accused persons where seals on samples were found broken or replaced without explanation, where the forwarding memo sent to the forensic laboratory did not match the seal description recorded in the original seizure memo, where no evidence was led to establish safe custody of the sample in the malkhana, and where unexplained delay in transmitting samples to the laboratory raised the spectre of tampering. In *State of Punjab v. Gurmail Singh*, the Supreme Court held that any unexplained gap in the chain of custody creates reasonable doubt about the prosecution's case, while in *Union of India v. Bal Mukund*, the Court emphasised strict compliance with the NDPS Act's procedural safeguards. At the same time, courts have distinguished mere technical irregularity from substantive prejudice: in *D. Mohanlal v. State of Rajasthan* (2015), the Supreme Court observed that not every procedural lapse is fatal to the prosecution unless it is shown to have prejudiced the accused or compromised the integrity of the evidence, a qualification later reinforced in *Varinder Kumar v. State of Himachal Pradesh*, where the Court held that an overlap between the informant and investigating officer does not automatically vitiate a trial absent demonstrated prejudice.

This NDPS-specific jurisprudence is directly relevant to toxicological evidence in poisoning and drug-facilitated crime cases because the underlying scientific and custodial concerns—sample integrity, sealing, transmission delay, and unauthorised access—are structurally identical, even though the substantive offence and statutory regime differ.

2.3 Electronic evidence and the certification regime

Because modern toxicological analysis is heavily instrumented—generating chromatograms, spectra, and laboratory information-management-system records that are stored and transmitted electronically—toxicology reports frequently qualify as electronic records requiring compliance with India's certification regime for secondary electronic evidence. The Supreme Court's ruling in *Anvar P.V. v. P.K. Basheer* (2014) held that Sections 65A and 65B of the Indian Evidence Act, 1872 constituted a complete code for the proof of electronic records, such that secondary electronic evidence could not be proved through ordinary oral or secondary-evidence rules in the absence of the mandatory Section 65B(4) certificate, thereby overruling the more permissive approach of the earlier decision in *State (NCT of Delhi) v. Navjot Sandhu* (2005). This certification requirement now finds its updated expression in Section 63 of the Bharatiya Sakshya Adhiniyam, 2023, discussed further in Section 3.3 below.

3. Chain of Custody under India's New Criminal Laws

3.1 Mandatory forensic investigation: Section 176(3) BNSS

Section 176(3) of the Bharatiya Nagarik Suraksha Sanhita, 2023 represents one of the most significant structural changes affecting the chain of custody at its origin point. The provision mandates that in cases involving offences punishable with seven years' imprisonment or more—including unnatural death, custodial death, rape, and gang rape—a forensic expert must visit the crime scene to collect evidence and to record the collection process, using mobile phones or other electronic devices, and that where a state lacks the necessary forensic facility, it must utilise the facility of another state. This provision statutorily embeds forensic-expert presence at the crime scene as the default rule for serious offences, replacing a practice that was previously discretionary and inconsistently followed. For toxicological evidence specifically, this is significant because sample collection at the point of origin—before decomposition, evaporation, or degradation can compromise the analyte—is the single most important determinant of eventual detectability, as documented in the Indian literature on delayed and negative viscera reports.



3.2 Custody chronology for electronic and forensic evidence: Section 193(2)(i) and Section 293 BNSS

Section 193(2)(i) of the BNSS mandates that, in cases involving electronic devices, the police report (charge-sheet) must include the chronology of custody of that evidence, a provision aimed at ensuring that the movement of electronic evidence—which, in a modern toxicology laboratory, includes instrument data files and digital chain-of-custody logs—is transparently documented from seizure through to trial. Separately, Section 293 of the BNSS governs the admissibility of reports from government scientific experts, including chemical examiners and forensic toxicologists, permitting such reports to be used as evidence provided the underlying process of collection and custody is shown to be legally sound; commentary on this provision emphasises that Indian courts have consistently held that even a comparatively minor lapse in the custody chain can vitiate the evidentiary value of a forensic science laboratory report, notwithstanding the formal admissibility of the report itself under Section 293. Section 329 of the BNSS further streamlines the process for admitting reports of government scientific experts and for their examination, including provision for deputed examination where the original expert is unavailable.

3.3 Expert certification of electronic records: Section 63 BSA

As discussed in Section 2.3, toxicology reports generated or transmitted electronically must satisfy the certification requirements now codified in Section 63 of the Bharatiya Sakshya Adhiniyam, 2023, which requires, in addition to a certificate from the person in charge of the relevant computer or communication device, a supporting certificate from an expert, submitted in a prescribed two-part schedule format. This dual-certification structure is intended to reinforce the reliability of electronically generated toxicological data, but it also multiplies the number of custodial and certifying actors involved in bringing a single toxicology report to trial, each of whom represents an additional potential point of documentation failure if institutional capacity is not correspondingly strengthened.

3.4 Property and sample disposal: Section 497 BNSS

Section 497 of the BNSS governs the custody and disposal of property—including biological samples—produced before a court or magistrate during investigation, inquiry, or trial, empowering the court to determine how such property should be managed pending the conclusion of proceedings, including directing sale or disposal where the property is subject to speedy or natural decay. For toxicological samples, which are inherently subject to degradation over time, this provision is directly relevant to preserving both the integrity of the sample for potential re-analysis and the chain-of-custody documentation associated with any court-ordered disposal.

3.5 Timelines: an indirect but significant custody safeguard

The BNSS introduces specific procedural timelines that bear indirectly, but significantly, on custody integrity in toxicology-adjacent cases: medical practitioners examining rape victims are now required to submit their reports to the investigating officer within seven days, and the accused may be required to submit to medical examination, including DNA profiling where necessary, at the request of a police officer under Section 52 read with related provisions. Because delay is one of the most consistently documented causes of both custody-chain breaks and negative toxicological findings in the existing Indian literature, statutory timelines of this kind—provided they are enforced—represent a potentially meaningful, if indirect, chain-of-custody reform.



4. Persistent Infrastructural and Procedural Gaps

4.1 The gap between statutory mandate and laboratory capacity

Commentary on the BNSS's forensic provisions has observed that mandating forensic-expert attendance at crime scenes and formal recording of the collection process is a valuable reform on paper, but that its practical efficacy depends entirely on the availability of trained forensic personnel and functioning laboratory infrastructure—resources that remain unevenly distributed across Indian states. Empirical studies of India's existing forensic science laboratory system document average delays of fifteen to thirty days simply to transport viscera from mortuary to laboratory in more than a third of cases, and delays of one to three months for the chemical examiner's report to be furnished in nearly three-quarters of cases; a more recent study of medical-board autopsies found that over 40 percent of viscera reports took more than a year to arrive, with almost 12 percent never received at all, and identified a statistically significant association between longer delay and negative toxicological findings. Because none of these delays are new problems created by the transition from the old to the new criminal codes, the BNSS's procedural mandates—however well-designed—cannot by themselves resolve a capacity deficit that is fundamentally about the number of accredited laboratories, trained chemical examiners, and functioning transport and storage infrastructure available to the system.

4.2 The compounding effect of dual certification requirements

As noted in Section 3.3, the BSA's dual-certification regime for electronic toxicological records requires both a device-custodian certificate and an expert certificate. While intended to strengthen reliability, this requirement presumes the ready availability of forensic personnel competent to issue the expert certificate—an assumption that sits uneasily with the well-documented shortage of trained toxicologists and forensic scientists in many state FSLs. There is a genuine risk that, absent parallel investment in forensic human resources, the dual-certification requirement becomes either a further source of delay (as laboratories struggle to produce the required certificates) or a procedural formality complied with nominally rather than substantively, undermining the reform's intended purpose.

4.3 Continuing reliance on judicial doctrine rather than codified chain-of-custody standards

Notably, none of the BNS, BNSS, or BSA introduces a single, consolidated statutory chain-of-custody standard applicable uniformly across categories of forensic and toxicological evidence, comparable to the detailed chain-of-custody protocols mandated for narcotics samples under the NDPS Act and its associated Narcotics Control Bureau standing orders. Instead, the new codes distribute custody-related obligations across several discrete provisions—Section 176(3) BNSS (crime-scene forensic attendance), Section 193(2)(i) BNSS (custody chronology for electronic evidence), Section 293 and 329 BNSS (admissibility of expert reports), and Section 63 BSA (electronic record certification)—leaving courts to continue relying substantially on judicially developed doctrine, particularly the NDPS jurisprudence discussed in Section 2.2 and the general "unbroken chain" principle from *Tomaso Bruno*, to fill the resulting gaps for toxicological evidence that does not arise in a narcotics-specific context.

4.4 Absence of a uniform, standardised custody form for biological samples

Unlike narcotics cases, where standing orders and established seizure-memo practices provide a relatively standardised documentation trail, toxicological sample collection in poisoning, drug-facilitated crime, and general medico-legal autopsy contexts continues to lack a single, nationally standardised chain-of-custody form specifying required fields (collector identity, time and place of collection, seal number, transport



custodian, receiving laboratory official, and analysis date) analogous to the forms used in comparable systems internationally. The absence of such uniformity increases the likelihood of the kind of documentation mismatches—between seizure memos and forwarding memos, for instance—that have repeatedly proved fatal to NDPS prosecutions and that carry equal force in toxicology cases generally.

5. Towards a Strengthened Chain-of-Custody Framework for Toxicological Evidence

Building on the preceding analysis, this paper proposes the following reforms to translate the BNSS and BSA's statutory groundwork into a genuinely strengthened chain of custody for toxicological evidence.

First, a uniform national chain-of-custody form for biological samples. The Directorate of Forensic Science Services, in coordination with state forensic science laboratories, should mandate a single standardised form—applicable across poisoning, drug-facilitated crime, and narcotics cases alike—capturing every custodial transfer from collection to final disposal, thereby extending the documentation discipline currently associated with NDPS practice to toxicological evidence generally.

Second, capacity investment to match Section 176(3) BNSS obligations. Since the mandatory crime-scene attendance of forensic experts under Section 176(3) is only as effective as the number of trained personnel available to fulfil it, state governments should be required to report, and the Union government to monitor, forensic staffing ratios against the caseload generated by the seven-year-imprisonment threshold, with interim inter-state facility-sharing arrangements (as already contemplated by the BNSS) formalised through binding protocols rather than ad hoc arrangements.

Third, statutory timelines for sample transmission and analysis specific to toxicology. Just as the BNSS now prescribes a seven-day timeline for medical examination reports in sexual-assault cases, a comparable, enforceable timeline should govern the transmission of viscera and toxicological samples from mortuary or hospital to FSL, and from FSL analysis to report issuance, directly targeting the delay documented as the leading driver of negative and unreliable toxicological findings.

Fourth, judicial and prosecutorial training on the custody-integrity implications of the new codes. Given that the BNS, BNSS, and BSA are recent enactments still being interpreted by trial courts, structured training for judges, public prosecutors, and investigating officers on the specific custody obligations introduced by Sections 176(3), 193(2)(i), 293, and 329 of the BNSS and Section 63 of the BSA is necessary to ensure these provisions are consistently applied rather than treated as formalities.

Fifth, extension of NDPS-style standing orders to general toxicological practice. The Narcotics Control Bureau's standing orders for narcotics sampling and custody have proved a workable, judicially validated model; a comparable set of standing orders, issued under the authority of the Directorate of Forensic Science Services or the Ministry of Home Affairs, should be developed specifically for toxicological sample collection in non-narcotics contexts, including poisoning deaths and drug-facilitated crime.

6. Conclusion

India's new criminal-law trilogy takes meaningful steps toward codifying chain-of-custody obligations that were previously the product of judicial doctrine developed largely in the narcotics context. Section 176(3) of the BNSS embeds forensic-expert attendance at serious-offence crime scenes as a statutory default; Section 193(2)(i) requires documented custody chronology for electronic evidence; Sections 293 and 329 streamline, while preserving the integrity conditions attached to, the admissibility of government scientific expert reports; and Section 63 of the BSA extends certification requirements to electronically generated toxicological data. These reforms formalise, and in some respects extend, principles long recognised by the Supreme Court in



decisions such as *Mohan Lal, Union of India v. Mohanlal, Tomaso Bruno, and Anvar P.V. v. P.K. Basheer*. However, statutory codification alone cannot resolve the infrastructural deficits—chronic delay in sample transmission and analysis, uneven distribution of trained forensic personnel, and the absence of a single standardised custody form for biological evidence—that have historically produced the very custody breaks these provisions are designed to prevent. Realising the full evidentiary benefit of the new codes will require sustained investment in forensic capacity, standardisation of documentation practice, and judicial and prosecutorial familiarity with the new provisions, alongside the legislative text itself.

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