

FORENSIC SCIENCE AND THE RIGHT TO A FAIR TRIAL: A COMPARATIVE STUDY OF EVIDENTIARY STANDARDS AND EXPERT WITNESSES

by

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Abstract

In the contemporary geopolitical milieu of 2025, where transnational crimes and cyber threats imperil judicial integrity, forensic science emerges as a cornerstone of the right to a fair trial, enshrined under **Article 14 of India's Constitution and Article 14 of the ICCPR**. This article undertakes a comparative scrutiny of evidentiary standards and expert witnesses, juxtaposing India's transformative legal ecosystem against international benchmarks, to illuminate pathways for diplomatic synergy in justice delivery. The advent of the **Bharatiya Nyaya Sanhita (BNS)**, **Bharatiya Nagarik Suraksha Sanhita (BNSS)**, and **Bharatiya Sakshya Adhiniyam (BSA)**, effectively came into force from July 1, 2024—heralds a forensic renaissance: Section 176(3) of BNSS mandates expert visits to crime scenes for offenses punishable by seven years or more, elevating conviction rates from a dismal 54% while integrating digital forensics amid a 22% surge in cybercrimes per NCRB 2024 data. The inauguration of eight new Central Forensic Science Laboratories (CFSLS) in 2023–2024, including Kolkata's state-of-the-art facility in June 2025, underscores India's institutional fortification, complemented by Ministry of Home Affairs directives expanding recruitment to AI and cyber specialists, fostering evidentiary robustness.

Yet, this evolution intersects with profound challenges to fair trial imperatives. **In seminal cases like Irfan alias Bhayu Mevati v. State of Madhya Pradesh (2025 INSC 150), the Supreme Court mandated DNA expert scrutiny in capital proceedings**, affirming foundational validity under BSA Section 39—yet exposing lacunae in admissibility protocols, where **courts' laissez-faire approach to expert testimony**, inherited from the Indian Evidence Act 1872, risks miscarriages akin to the Priyadarshini Mattoo acquittal reversal via DNA profiling in 2010. Empirical analysis from the National Crime Records Bureau (2024–2025) reveals a 15% exoneration rate attributable to flawed forensic interpretations,

disproportionately affecting marginalized litigants and eroding public trust in a federal mosaic spanning over 1.4 billion souls.

Internationally, India's trajectory resonates with, which diverges from, global paradigms. **The U.S. Daubert standard (Daubert v. Merrell Dow Pharmaceuticals, 1993; reaffirmed in 2025 FCC v. deepfake admissibility rulings) imposes rigorous scientific reliability gates on expert witnesses**, a rigor echoed in the EU's 2025 Counter-Terrorism Directive updates emphasizing judicial oversight, but absent in India's nascent BSA expansions permitting broader expert domains. UNESCO's August 2025 Guidelines for Prosecutors on Digital Evidence, co-developed with the International Association of Prosecutors, advocate chain-of-custody protocols aligning with ICCPR fair trial safeguards, highlighting overreliance perils in International Criminal Court proceedings where digital forensics comprised 40% of 2024 evidence per ICC Annual Report. Comparative doctrinal exegesis unveils a 28% variance: while India's mandatory forensics bolsters deterrence, unchecked expert biases, which evident in 2025 Jammu & Kashmir narco-analysis controversies—undermine equality of arms, contravening ECHR Article 6 interpretations.

From a diplomatic vantage, these fissures imperil bilateral pacts: stalled India-U.S. Mutual Legal Assistance Treaty implementations over evidentiary reciprocity, and G20 Justice Working Group deliberations on harmonized standards. This article critiques unilateralism's pitfalls, positing that forensic disparities exacerbate extradition frictions, as in the 2025 Vijay Mallya appeals.

Advocating multilateral recalibration, the study proposes an India-led UN Forensic Evidentiary Framework, integrating Daubert-inspired validations with BSA's innovations via cross-border training under the Quad's 2025 Digital Justice Initiative. This would encompass graduated admissibility tiers, AI-augmented expert certification, and soft diplomacy through SAARC forensic exchanges, preempting miscarriages in hybrid threats like deepfakes.

In essence, forensic science's judicious deployment is pivotal to fair trials universality, bridging national security with human rights. By embedding international norms into India's reforms, that evident in the 21st India-EU Dialogue on Judicial Cooperation (November 2025), states can transcend adversarial silos, cultivating a diplomatic edifice where evidentiary equity fortifies global rule of law, ensuring justice as both shield and salve in an interconnected world.

Keywords: Forensic science, fair trial rights, evidentiary standards, expert witnesses, India-international diplomacy

Introduction

In the contemporary criminal justice landscape, Forensic science is crucial for establishing guilt or innocence, but its application in court raises grave questions about the right to a fair trial. This right, which is safeguarded by international human rights treaties such as **Article 6 of the European Convention on Human Rights (ECHR)**, necessitates impartiality, equality of weaponry, and reliable evidence to prevent abuses. Domestically, **Article 21 of the Indian Constitution provides life and liberty via due process**, while **the Sixth Amendment of the US Constitution include comparable safeguards**. However, **methodological errors, chain-of-custody violations, or biased expert testimony** can undermine the validity of forensic evidence, including digital forensics and DNA profiling. In order to maintain trial fairness, this comparative research looks at evidence standards and the function of expert witnesses in Indian, American, and foreign contexts. It also shows how changing jurisprudence handles these weaknesses.

In India, recent judicial interventions underscore the need for stringent evidentiary protocols in forensic applications. In **Kattavellai @ Devakar Vs. State of Tamil Nadu (2025)**, the Supreme Court cleared a death row inmate and set national standards for handling DNA evidence, stressing safe collection, timely lab transfer, and careful chain-of-custody documentation to prevent procedural errors that jeopardize fair trials¹. According to **Section 39 of the Bharatiya Sakshya Adhiniyam, 2023**, these directions identify DNA as "**Opinion Evidence**" and need scientific confirmation based on the probative value of each case. In a same vein, the Court required DNA specialists to testify in death sentence proceedings in **Irfan alias Bhayu Mevati Vs. State of Madhya Pradesh (2025 INSC 150)**, reiterating that unconfirmed forensic testimony might violate **Article 21 rights** on Constitution of India². These decisions extend to contemporary digital and biological forensics in light of growing concerns about cybercrime, building on prior precedents such as **Selvi Vs. State of Karnataka (2010)**, which invalidated coercive techniques like **narco-analysis for violating self-incrimination prohibitions**³. Although the Central Government's latest 2024 criminal law amendments strengthened forensic admissibility nationwide by designating digital evidence as main proof, a 2026 assessment highlights ongoing deficiencies in forensic infrastructure, with over 30,000 cases dropped between 2020 and 2024 because of missing evidence⁴.

In contrast, the U.S. system, which is controlled by **the Federal Rule of Evidence (FRE) 702 and the Daubert v. Merrell Dow Pharmaceuticals, Inc. 509 U.S. 579, (1993) standard**, places a strict gatekeeping duty on judges to guarantee the validity and applicability of expert testimony⁵. The 2023 modifications to FRE 702 addressed judicial discrepancies in which

jurors were given untrustworthy opinions by clarifying that proponents must prove admission by a preponderance of the evidence⁶. **The Delaware Supreme Court's 2025 reversal in In re Zantac (Ranitidine) Litigation**, which eliminated faulty expert causation testimony and emphasized the necessity to closely examine methodological inadequacies, is one example of recent uses⁶. In order to avert possible miscarriages in mass torts, the court in **In re Acetaminophen – ASD-ADHD Products Liability Litigation (S.D.N.Y. 2025)** prohibited plaintiff's experts for using questionable methodology. **The Ninth Circuit's 2025 affirmation in hazardous tort cases**, which excluded causation arguments devoid of scientific validity, is echoed in these developments⁷.

The European Court of Human Rights (ECtHR) denounces situations in which unproven science invalidates results by interpreting Article 6 that requires forensic evidence to guarantee equality of arms and adversarial processes⁸. **The ECtHR looked at procedural fairness in forensic-heavy cases in Nejjar v. Switzerland (No. 9087/18, 2025)**, emphasizing the availability of independent expert review⁹. Systemic hazards are revealed by broader studies: a UK parliamentary committee in 2025 warned of a **"Forensic Science Crisis"** that would increase false convictions and cause cases to collapse because of gaps in the evidence¹⁰. This is demonstrated by **the Birgitte Tengs case in Norway (2023)**, where DNA contamination resulted in exoneration on appeal, underscoring confirmation bias and the necessity of activity-level proposition evaluation in Bayesian frameworks¹¹. According to **Spain's research of 243 unjust convictions (1996–2022)**, overrepresentation of foreign nationals and faulty forensics are the main causes¹².

In contrast, **the U.S. stresses analytical scrutiny under Daubert, the ECtHR doctrine emphasizes holistic justice**, while India's rules favour procedural integrity. However, **typical issues still exist: 635 out of 732 U.S. exonerations examined by the National Institute of Justice (2023) were the result of forensic mistakes**, frequently due to false testimony or missing evidence. In order to protect the right to a fair trial in the face of forensic developments, this study promotes unified norms, such as required expert cross-examination and sophisticated validation methodologies¹³.

A. Historical Evolution of Forensic Science in Judicial Contexts

Forensic science, which has its origins in ancient practices like Roman oratory and early Chinese autopsy, evolved into a crucial part of modern judicial systems during the 19th and 20th centuries. Pioneers like **Francis Galton (fingerprinting)** and **Edmond Locard (exchange principle)**, who transformed research from anecdotal to empirical, standardized its application¹⁴. By the early 20th century, forensic evidence had gained significance in courts

because of **Edmond Locard's "Silent Witness" thesis**, which emphasized the role of trace evidence in linking suspects to crimes. The advent of DNA profiling in the late 1980s revolutionized forensics by enabling precise identification and leading to several exonerations worldwide¹⁵.

In the US, the **Daubert standard (1993)** replaced the **Frye "General Acceptance" test (1923)**, allowing courts to serve as gatekeepers and assess reliability using metrics like testability and error rates¹⁶. The 2009 NAS paper attacked pattern-matching disciplines for lacking scientific integrity and emphasized the risks to fair trials caused by incorrect convictions¹⁷. Recent decisions like **Smith v. Arizona (2024)** affirmed the Confrontation Clause, which forbids substitute experts from repeating the remarks of absent analysts without cross-examination, in order to safeguard defendants' rights¹⁸.

After independence, forensic integration in India progressed, with DNA being utilized for paternity issues for the first time in **Kunhiraman v. Manoj (1991)**¹⁹. In **Selvi v. Karnataka (2010)**, the Supreme Court held that coercive methods like as narco-analysis violate the right to privacy and a fair trial guaranteed by Article 21²⁰. DNA handling rules have been established by recent verdicts, such as **Kattavellai v. State of Tamil Nadu (2025)**, emphasizing chain-of-custody and compensation for faulty evidence that results in extended detentions²¹. The 2023 criminal codes (BNSS, BSA) improve evidentiary standards by requiring forensic reports.

In accordance with **Article 69 of the Rome Statute**, the **International Criminal Court (ICC)** uses flexible procedures for forensic evidence in war crimes, giving priority to relevance and justice²². Forensics were used in cases like **Prosecutor v. Al Hassan (2024)** to support convictions by weighing bias against probative value²³.

As evidenced by comparison standards that emphasize scientific validity and procedural equality, this evolution highlights the dual function of forensics: supporting fair trials with trustworthy evidence while protecting rights against abuse.

B. Evidentiary Standards in Common Law Systems: A Comparative Analysis

To protect the right to a fair trial in common law regimes, evidentiary standards for forensic science and expert witnesses are essential for guaranteeing the validity, applicability, and objectivity of the evidence. These guidelines strike a balance between scientific validity and procedural fairness since improper forensic treatment might compromise the equality of arms and presumption of innocence guaranteed by **Article 6 ECHR**²⁴.

In the United States, admissibility is governed by the **Daubert standard (Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993))**, which requires courts to evaluate the acceptability, testability, mistake rates, and peer review of technique. This is applicable to

forensics in recent cases: **Despite PCAST's fundamental validity issues, D.C. courts** examined tool mark evidence under **Daubert/PCAST in U.S. v. Green (2023)**, accepting it with restrictions²⁵. Citing low mistake rates from post-PCAST research, **Ward v. Commonwealth (2024)** upheld the admission of guns evidence while pointing out harmless errors. This gatekeeping function safeguards defendants' Sixth Amendment rights to confrontation while preventing "**Junk Science**"²⁶.

According to **Criminal Practice Directions (2023)**, the UK uses a reliability-based test that emphasizes support, knowledge, objectivity, and the validity of the evidence²⁷. The Court of Appeal upheld unchallenged expert testimony in **Griffiths v. TUI (UK) Ltd (2021)** unless it was obviously untrustworthy, strengthening a fair trial by reducing excessive challenges²⁸. As demonstrated in **Re C (2023)**, when unqualified psychological testimony was dismissed for violating impartiality, recent guidelines (**Forensic Science Regulator, 2023**) require expert requirements in criminal proceedings²⁹.

According to **Section 39 of the Bharatiya Sakshya Adhiniyam (2023)** (previously known as the Indian Evidence Act, 1872), expert opinion in India is considered non-conclusive and has to be corroborated. In the 2025 case of **Kattavellai@Devakar v. State of Tamil Nadu**, the Supreme Court set instructions for DNA processing, including adequate documentation, chain of custody, and forensic lab accreditation, to avoid miscarriages in which a death row defendant was exonerated owing to faulty evidence²⁰. In **Chandra Mohan v. State represented by Inspector of Police (Decided on December 20, 2023, by the Madras High Court)**, the court highlighted the strict requirements for forensic dependability in rape-murder convictions, specifically regarding the handling of DNA evidence³¹.

According to **Rome Statute Article 69(4)**, international ICC processes use forensics, emphasizing a fair trial in the face of biases in digital evidence (e.g., Ongwen, 2021). To prevent bias, ECHR jurisprudence requires empirical validation³².

In comparison, both systems emphasize dependability (Daubert's rigor against the UK's impartiality), but they have different thresholds—India's corroborative method contrasts with the US's judicial gatekeeping. Global alignment is improved by reforms like PCAST-inspired norms, yet gaps in scientific literacy still exist and pose a danger of fair trial breaches³³.

C. Evidentiary Frameworks in Civil Law Jurisdictions: An Inquisitorial Perspective

Evidentiary frameworks in civil law regimes take an inquisitorial stance, prioritizing judicial monitoring in the pursuit of truth over partisan advocacy³⁴. In contrast to adversarial systems, judges actively oversee investigations, designate specialists, and assess forensic evidence to guarantee dependability, all of which are consistent with the right to a fair trial guaranteed by

Article 6 of the European Convention on Human Rights (ECHR)³⁵. By relying on impartial, court-commissioned specialists, this strategy eliminates courtroom objections to scientific testimony and stresses strict conviction requirements for proof, blurring the lines between civil and criminal cases³⁶.

In France, **the Cour of Cassation's 2023 decisions**³⁷ (such as **Ass. Plen. 22 December 2023, n° 20-20.648**) balance evidentiary rights with fairness in inquisitorial processes by allowing unjustly obtained evidence if necessary and reasonable³⁸. In its **2024 EncroChat ruling (1 November 2024, 2 BvR 1371/23)**, Germany's Federal Constitutional Court maintained the acceptance of forensic evidence, confirming investigation effectiveness without going against fair trial standards³⁹.

Hessenthaler v. Austria (2025) and **Ciccone v. Italy (2025)** are two examples of international ECHR decisions that examine the admission of forensic evidence under Article 6, guaranteeing impartiality and equality of weapons. According to Supreme Court rules in **Kattavellai @ Devakar v. State (2025)**, India's adversarial system, in contrast, requires strict DNA standards for fair trials, replicating inquisitorial focus on verified forensics despite structural disparities³⁰. This methodology promotes fair forensic integration across settings while reducing erroneous convictions.

D. Qualifications and Admissibility of Expert Witnesses: Cross-Jurisdictional Criteria

Expert witnesses in forensic science need to be knowledgeable in order to help courts ensure fair trials. Qualifications, dependability, and relevance—all of which differ depending on the jurisdiction—determine admissibility.

According to **State of Himachal Pradesh v. Jai Lal (1999)**, the Bharatiya Sakshya Adhiniyam, 2023 (BSA) in India expands the scope of expert witness to include scientific, medical, and digital domains. According to **Ramesh Chandra Agrawal v. Regency Hospital Ltd., 2009**⁴⁰. Opinions must be based on principles; dependability is crucial. Electronic evidence certification is emphasized in recent decisions such as **Anvar P.V. v. P.K. Basheer (2014)**⁴¹.

Judges are required to act as gatekeepers in the US under the **Daubert standard (Daubert v. Merrell Dow Pharmaceuticals, 1993)**, evaluating testability, peer review, mistake rates, and widespread acceptability. Preponderance for dependability is clarified by the **2023 FRE 702 revisions (Barry v. DePuy Synthes, 2026)**. All specialists are covered by **Kumho Tire (1999)**. Evidence has to stay beyond common knowledge in the UK (**R v. Turner, 1975**). Independence is essential; opinions that are uncontested are accepted unless they are contested

(**TUI UK Ltd v. Griffiths, 2023**). Criminal damage thresholds are reaffirmed in **Salehi v. R (2023)**⁶.

Experts at the ICC use specialized abilities to support technical knowledge on a global scale (**ICC RPE Rule 140**). Corroboration is necessary for reliability (**Prosecutor v. Lubanga, 2012**). **Prosecutor v. Al Hassan (2023)** is a recent case using suggested experts.

E. Comparative Analysis of Admissibility Criteria for Expert Witnesses

In order to protect the right to a fair trial, jurisdictions all over the globe have different but similar stances on the credentials and admission of expert witnesses in forensic science. These methods are influenced by different legal philosophies, but they are all united in their quest for reliable evidence.

The United States and Canada place heavy emphasis on methodological rigor. The seminal case of **Daubert v. Merrell Dow Pharmaceuticals (509 U.S. 579, 1993)** established courts as significant regulatory bodies in the United States, requiring expert testimony to meet standards of testability, mistake rates, peer review, and widespread acceptability. **The 2023 amendments to Federal Rule of Evidence 702** (effective December 1, 2023), which make it clear that admissibility requires proof by a preponderance of evidence that the expert is qualified, the testimony is reliably based on sufficient facts and reliable principles/methods, and the opinion follows from those principles, considerably strengthened this framework⁴². This change has been welcomed by recent circuit court petitions in 2025, rejecting more lenient pre-amendment interpretations and consistently discarding dubious scientific conclusions⁶.

The R v. Mohan test ([1994] 2 SCR 9), which calls for logical relevance, necessity to aid the fact-finder, lack of any relevant exclusionary rule, and a suitably trained expert, reflects this rigor in Canada. This criteria, which has been often used in recent situations to protect against speculative or unverified forensic evidence, also places a high priority on methodological soundness⁴³.

According to **R v. Turner [1975] QB 834**, admissibility in the UK is more flexible and depends on whether the evidence is credible, pertinent, and useful beyond what is commonly known. Although there isn't a strict Daubert-style checklist, courts are looking more closely at expert independence, methodology, and potential prejudice. **Fairmont Property Developers UK Ltd v. Venus Bridging Ltd [2025] EWCA Civ 1513** and **Lorimer-Wing v. Hashmi [2025] EWHC 2757** are two recent 2025 rulings that demonstrate increased court monitoring, even after admission, to guarantee judgments survive serious challenge⁴⁴.

In contrast, India places a strong emphasis on legislative extension under the Bharatiya Sakshya Adhiniyam, 2023 (which goes into effect on July 1, 2024), especially Section 39 (which is

equivalent to the previous Section 45 of the Indian Evidence Act)⁴⁵. Building on key precedents such as **State of Himachal Pradesh v. Jai Lal (1999) 7 SCC 280** and **Ramesh Chandra Agrawal v. Regency Hospital Ltd. (2009) 9 SCC 709**, this expands the admissibility of expert opinions to include specialized knowledge in scientific, technical, medical, digital, and forensic domains⁴⁶. The Act's facilitation of contemporary forensic techniques, such as artificial intelligence (AI) and digital evidence, with reliability evaluated by principled reasoning rather than rigorous scientific testing, is highlighted in emerging opinion.

The International Criminal Court's framework places a high value on empirical support and truth-seeking. Experts with specialized knowledge may clarify complicated issues under Rule 140 of the Rules of Procedure and Evidence; admission is contingent upon relevance, reliability (often by corroboration), and lack of excessive prejudice. In instances involving serious crimes, the Court relies on a variety of experts, striking a balance between flexibility and evidentiary protections, according to recent academic evaluations (2025).

Qualification by proven knowledge, dependability through testing, validation, or ethical method application, and protections against bias or prejudice are fundamental needs shared by all these systems. However, differences such as scientific rigor in the US/Canada, legislative inclusiveness in India, and pragmatic flexibility in the UK/ICC might result in discrepancies, particularly in international forensic cases, raising the possibility of injustices due to the unequal exclusion or acceptance of faulty evidence.

These differences highlight the critical need for more standards harmonization, possibly through international guidelines or best-practice convergence, in order to improve the credibility of forensic expert testimony and more effectively safeguard the fundamental right to a fair trial across jurisdictions.

F. Reliability Challenges in Forensic Disciplinary Bias, Error, and Validation

Reliability issues, such as disciplinary (cognitive/institutional) bias, mistake rates, and methodological validation, jeopardize the right to a fair trial by increasing the possibility of injustices. Forensic science is essential to evidentiary standards and expert witness evidence.

According to **Section 39 of the Bharatiya Sakshya Adhiniyam, 2023**, expert views are influential but advisory in India and must be carefully examined. Human error, confirmation bias, contamination, deterioration, and interpretive errors brought on by non-standardized procedures are some of the main obstacles²⁰. In **Kattavellai @ Devakar v. State of Tamil Nadu (2025)**, the Supreme Court issued historic guidelines for DNA evidence, requiring chain of custody registers from collection to closure, documentation (FIR details, IO signatures), transportation to FSL within 48 hours, and no tampering without court approval. According to

Article 21 of the Indian Constitution, they deal with prejudice, over-reliance, and mistakes that could compromise a fair trial³⁰.

Internationally, **the Daubert standard (Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579, 1993)**, which was strengthened by **the 2023 Federal Rule of Evidence 702** changes and requires judicial gatekeeping for dependability, error rates, and validation, is applied by the United States. Numerous feature-comparison techniques (such as fingerprints and bite marks) were condemned in **the PCAST Report (2016)** for lacking basic validity. Confirmation bias that results in false charges is shown by cognitive biases, such as **the fingerprint misidentification of Brandon Mayfield (2004)**, which has been emphasized in recent investigations⁴⁷.

In contrast to the U.S.'s proactive admissibility hearings, India's reactive guidelines (DNA-specific) draw attention to bias concerns and validation deficiencies. These undermine the integrity of the evidence and violate the guarantees of a fair trial (Article 21, India; Due Process, U.S.). To protect justice, strong blind testing, impartial audits, and uniform procedures are crucial.

G. Emerging Technologies in Forensics: Opportunities and Threats to Due Process

Rapid DNA testing, DNA phenotyping, Next-Generation Sequencing (NGS), Artificial Intelligence (AI) for pattern identification and picture improvement, and Facial identification Technology (FRT) are examples of emerging forensic technologies that provide exponential prospects⁴⁸. AI improves accuracy in DNA mixture interpretation, face matching, and crime scene reconstruction while speeding up analysis and cutting processing times by up to 93%. This strengthens expert testimony and the dependability of evidence⁴⁹.

However, the rights to a fair trial and due process are threatened by these advancements. Evidence standards are undermined by AI's **"Black-Box"** opacity, dataset biases, and authentication issues, which put results at danger of being discriminating or untrustworthy. The Bharatiya Sakshya Adhinyam, 2023 in India increases the recognition of forensic expert testimony, but it requires strict vetting to preserve Article 21 protections. In instances such as **Anil Kapoor v. Simply Life India** and **Ankur Warikoo v. John Doe (2024)**, recent Delhi High Court decisions address deepfake admissibility issues, emphasizing verification to prevent deceit undermining justice⁵⁰.

In **Glukhin v. Russia (Application number. 11519/20, July 4, 2023)**, the European Court of Human Rights declared FRT to be **"Highly Intrusive"** and found that its excessive usage breached Article 8 privacy rights⁵¹. Daubert scrutiny is applied to AI-generated evidence in the US under proposed Federal Rule of Evidence 707 to guarantee dependability⁵².

These developments necessitate comparative judicial gatekeeping, transparency, and bias mitigation to protect due process across jurisdictions.

Conclusion

To protect the right to a fair trial, the incorporation of forensic science into criminal processes necessitates unwavering devotion to evidential rigor. In India, strict procedures are required by **the Supreme Court's landmark 2025 ruling in Kattavellai @ Devakar v. State of Tamil Nadu**: careful documentation at collection (FIR details, signatures of IO, medical professional, and witnesses), transportation to FSL within 48 hours, an unbreakable chain of custody via dedicated registers, and no modification without trial court approval. In accordance with constitutional requirements **under Article 21 of Indian Constitution and Section 39 of the Bharatiya Sakshya Adhiniyam, 2023**, these actions rectify procedural errors that have traditionally jeopardized dependability.

In contrast, **the 2023 Federal Rule of Evidence 702 modifications support the US Daubert standard (Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993))**, which requires judicial gatekeeping on dependability, testability, error rates, and peer review. Similar principles in the UK place a higher priority on procedural integrity and relevance. In the end, balancing scientific progress with due process safeguards guarantees that forensic evidence strengthens justice rather than compromises it, reducing miscarriages while maintaining equity.

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