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Mandatory Forensic Intervention in Criminal Investigations: Evaluating Systemic Bottlenecks and Constitutional Challenges to the Right against Self-Incrimination

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ABSTRACT: Modern criminal justice systems increasingly rely on forensic science to enhance investigative accuracy and replace outdated, coercive methods. However, the practical integration of scientific evidence into the criminal justice process faces critical operational bottlenecks and complex constitutional challenges. This research paper evaluates the operational inefficiencies and legal friction points surrounding forensic interventions in criminal investigations. Operationally, the study highlights severe systemic bottlenecks, including massive case backlogs in forensic laboratories, inadequate technical infrastructure, compromised chain-of-custody protocols, and an acute shortage of trained experts. These operational deficiencies cause protracted delays in trial proceedings, directly threatening the fundamental right to a speedy trial. Constitutionally, the paper critically examines the friction between coercive forensic techniques such as narco-analysis, polygraph examinations, brain mapping, and forced biological sampling and the constitutional guarantee against self-incrimination. Drawing on contemporary judicial precedents, statutory provisions, and constitutional jurisprudence, the research analyzes the fine boundary where non-verbal or scientific data extraction borders on compelled testimony and violates personal liberty and bodily autonomy. The findings indicate that technological advancements have significantly outpaced statutory frameworks, creating regulatory vacuums and procedural vulnerabilities that undermine evidentiary integrity. Ultimately, the paper advocates for comprehensive legislative reform, standardized evidentiary procedures, capacity building across forensic laboratories, and clear judicial guidelines. Streamlining procedural efficiency while safeguarding foundational

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constitutional guarantees is paramount to ensuring that forensic innovation strengthens the rule of law without compromising fundamental human rights..

INTRODUCTION

The credibility of a criminal justice system rests, in significant measure, on the reliability of the evidence upon which it convicts or acquits. For much of independent India's legal history, criminal investigation remained overwhelmingly testimonial in character, dependent on eyewitness accounts, confessions, and circumstantial inference, with forensic science occupying a marginal and largely discretionary role. The consequences of this testimonial dependence wrongful acquittals arising from witness hostility, wrongful convictions arising from coerced confessions, and chronic delay arising from weak evidentiary foundations have been documented extensively by law commissions, judicial commentary, and empirical criminology alike.

The enactment of the Bharatiya Nagarik Suraksha Sanhita, 2023, which replaced the Code of Criminal Procedure, 1973 with effect from 1 July 2024, represents the most consequential legislative attempt to correct this imbalance. Section 176(3) BNSS mandates that, in every offence punishable with imprisonment of seven years or more, the officer in charge of a police station must ensure that a forensic expert visits the crime scene to collect forensic evidence, with the entire process videographed on a mobile phone or other electronic device. Where local forensic facilities are unavailable, the State Government is required to notify the utilisation of facilities from another State until domestic capacity is developed, and States have been granted a five-year window, running from the notified date, to operationalise the mandate. This provision does not stand alone: it operates alongside the Bharatiya Nyaya Sanhita, 2023, which redefines substantive offences and penalties, and the Bharatiya Sakshya Adhiniyam, 2023, which expands the evidentiary status of electronic and digital records and formally recognises forensic and scientific evidence within the trial process.

The reform is animated by a legitimate and pressing state interest: strengthening conviction rates, reducing wrongful prosecutions, and modernising an investigative apparatus that has lagged behind comparable jurisdictions in the use of DNA profiling, digital forensics, and crime-scene science. Yet the same reform raises two distinct but interlocking concerns that form the subject of this paper. The first is institutional: whether India's forensic science infrastructure its laboratories, personnel, and equipment possesses the capacity to discharge a mandate that Parliament has now made compulsory rather than discretionary. The second is constitutional: whether forensic techniques that involve the physical or psychological participation of an accused person, most acutely narco-analysis, polygraph examination, and brain-electrical activation profiling, can be reconciled with the constitutional guarantee against testimonial self-incrimination under Article 20(3) and the right to privacy, dignity, and mental integrity under Article 21.

This paper proceeds from the premise that these two concerns are not merely parallel but mutually reinforcing. A forensic mandate that outpaces institutional capacity creates pressure on investigating officers anxious to meet statutory time lines, and on courts anxious to avoid procedural default to resort to coercive shortcuts that the Constitution has long proscribed. Systemic bottlenecks, in other words, are not simply an administrative inconvenience; they are a constitutional risk factor. The paper therefore situates the doctrinal analysis of self-incrimination within an empirical account of forensic infrastructure, and draws on comparative practice in the United Kingdom, the United States, Australia, and Germany to identify workable safeguards for the Indian context.

2. LITERATURE REVIEW

The academic and official literature on forensic investigation reform in India can be organized around three broad strands: infrastructural critique, constitutional doctrine, and comparative procedural design.

2.1 Infrastructural Critique

Project 39A's Forensic Science India Report (2023) surveyed sixty-one forensic science laboratories and found that, of 3,211 sanctioned posts across twenty-six laboratories for which data was available, forty per cent remained vacant, with scientific posts as distinct from administrative posts disproportionately affected. The report further documented underutilization of modernization funds and administrative fragmentation between laboratories under police control and those under home department control. Earlier scholarship, including a widely cited 2021 review in Forensic Science International: Reports, estimated a national pendency of seven to eight hundred thousand cases even though referral rates to forensic laboratories stood at only ten to twelve per cent of registered cognizable offences, implying that full referral would multiply pendency several times over. The India Justice Report 2025 corroborated this picture, recording vacancy levels of approximately fifty per cent in forensic staffing nationally and linking evidentiary weakness to the disproportionately high share of under trial prisoners in Indian jails.

2.2 Constitutional Doctrine on Bodily and Testimonial Evidence

The doctrinal literature traces a continuous line from State of Bombay v Kathi Kalu Oghad (1961), which distinguished 'to be a witness' from mere production of physical evidence such as fingerprints or specimen handwriting, through Nandini Satpathy v P.L. Dani (1978), which extended Article 20(3) protection to the investigation stage and barred compelled answers likely to furnish a link in a chain of incriminating evidence, to the landmark decision in Selvi v State of Karnataka (2010). Selvi held that involuntary administration of narco-analysis, polygraph examination, and brain-electrical activation profiling violates both Article 20(3) and Article 21, characterizing the compelled intrusion into mental processes as an affront to personal liberty and dignity independent of the self-incrimination clause. Subsequent scholarship has examined how Justice K.S. Puttaswamy v Union of India (2017), by recognizing informational and decisional privacy as intrinsic to Article 21, deepened the constitutional foundation for Selvi's mental-privacy reasoning, while Tofan Singh v State of Tamil Nadu (2021) reinforced the inadmissibility of statements recorded by persons treated as police officers for the purposes of self-incrimination protection under special statutes.

2.3 Comparative and Reform-Oriented Literature

A smaller but growing body of writing examines the BNSS forensic mandate itself. Commentary published shortly after the provision's enactment has generally welcomed the shift toward scientific investigation while flagging implementation risk, noting that the five-year notification window effectively defers full compliance and that the statute does not prescribe consequences for non-compliance, raising questions about enforceability. Comparative literature on the United Kingdom's Police and Criminal Evidence Act 1984, the United States' Fourth and Fifth Amendment jurisprudence including Schmerber v California and Missouri v McNeely, Australian state forensic procedure statutes, and the German Strafprozessordnung's provisions on bodily examination has been used, in scattered form, to argue for graduated, judicially supervised, and proportionality-tested forensic intervention rather than blanket mandates. This paper draws these three strands together, contributing a unified empirical-doctrinal-comparative framework that the existing literature has not, to date, integrated in a single analytical account calibrated to the post-2023 codes.

3. RESEARCH GAP

Existing scholarship tends to treat the infrastructural deficit in Indian forensic science and the constitutional law of self-incrimination as separate fields of inquiry the former the domain of criminology and public administration, the latter the domain of constitutional doctrine. Very little published work examines how the two interact under the specific statutory architecture introduced by the BNSS, BNS, and BSA from 2024 onward, or asks whether a capacity gap of the scale documented by Project 39A and the India Justice Report is itself capable of generating constitutional violations by incentivizing coercive or corner-cutting investigative practice. Nor has the literature yet incorporated the 2025 Supreme Court decision in Amlesh Kumar v State of Bihar, which reaffirmed Selvi's prohibition on involuntary narco-analysis specifically in relation to the new procedural code, or systematically mapped state-wise forensic infrastructure against the mandatory thresholds introduced by Section 176(3) BNSS. This paper addresses that gap by combining doctrinal analysis, an original database-style compilation of publicly available official statistics, and a four-country comparative study within a single integrated framework.

4. RESEARCH QUESTIONS

What is the constitutional and statutory scope of the mandatory forensic investigation requirement introduced by Section 176(3) of the BNSS, 2023, read with the BNS and the Bharatiya Sakshya Adhiniyam?

To what extent does India's existing forensic science infrastructure possess the institutional capacity to implement this mandate, and what systemic bottlenecks constrain that capacity?

Do forensic techniques that require the active or passive participation of an accused person violate Article 20(3) and Article 21 of the Constitution, and how has the judiciary drawn the line between permissible and impermissible forensic intervention?

What can comparative practice in the United Kingdom, the United States, Australia, and Germany offer toward a constitutionally sustainable and institutionally realistic Indian model?

What policy and institutional reforms would reconcile the mandatory forensic investigation regime with constitutional guarantees while narrowing existing infrastructural bottlenecks?

5. OBJECTIVES

To analyse the statutory framework governing mandatory forensic investigation under the BNSS, BNS, and Bharatiya Sakshya Adhiniyam.

To assess, using publicly available official data, the institutional capacity of India's forensic science infrastructure to meet the new statutory mandate.

To critically examine the constitutional jurisprudence on self-incrimination and privacy as applied to forensic and neuro-scientific investigative techniques.

To undertake a comparative evaluation of forensic investigation regimes in the United Kingdom, the United States, Australia, and Germany.

To propose a policy framework for an integrated, rights-compliant national forensic model.

6. RESEARCH METHODOLOGY

This study adopts a doctrinal-cum-empirical research design. The doctrinal component involves analysis of primary legal sources the Constitution of India, the BNSS, the BNS, the Bharatiya Sakshya Adhiniyam, the erstwhile Code of Criminal Procedure and Indian Evidence Act, and relevant Supreme Court and High Court judgments supplemented by secondary sources including law commission reports, official committee reports, and peer-reviewed literature. The empirical component draws on secondary, publicly available quantitative data compiled from the National Crime Records Bureau's Crime in India reports, the Directorate of Forensic Science Services and Ministry of Home Affairs parliamentary responses, the National Forensic Sciences University's institutional disclosures, the National Judicial Data Grid, and Bureau of Police Research and Development publications. These figures are synthesized into original comparative tables rather than reproduced verbatim, and are used descriptively to illustrate patterns of infrastructural capacity and case pendency rather than to support causal inference. The comparative component follows a functional method, examining how four representative common-law and civil-law jurisdictions structure the relationship between compulsory forensic sampling and the privilege against self-incrimination, in order to identify transposable safeguards. Case selection for the comparative and judicial analysis sections was purposive, focused on landmark and recent decisions with direct bearing on the constitutional status of forensic and neuro-scientific evidence. The study is limited to publicly available secondary data current up to mid-2026 and does not involve primary fieldwork, survey instruments, or human subject research.

7. CONSTITUTIONAL FRAMEWORK

India's constitutional framework governing criminal investigation is anchored primarily in Article 20(3), Article 21, and Article 22 of the Constitution, read alongside the residual protection of Article 14 against arbitrary state action. Article 20(3) provides that no person accused of an offence shall be compelled to be a witness against himself, codifying the privilege against self-incrimination as a fundamental right rather than a mere rule of evidence. Article 21 guarantees that no person shall be deprived of life or personal liberty except according to procedure established by law, a guarantee that the Supreme Court has progressively read to encompass dignity, bodily integrity, mental privacy, and following Puttaswamy informational and decisional autonomy. Article 22 supplies procedural safeguards upon arrest and detention that indirectly bear upon the conditions under which forensic samples may be obtained.

Three interpretive principles drawn from this framework structure the analysis in this paper. First, the privilege against self-incrimination has been confined by the Court to testimonial compulsion the extraction of communicative or imparted knowledge while permitting compulsion for the production of physical or identificatory material such as fingerprints, specimen signatures, or blood samples, provided such production does not itself convey incriminating personal knowledge. Second, techniques that access the subject's mental processes, memory, or subconscious statements, even where the output is not verbal in the conventional sense, have been treated as testimonial in substance because they compel the mind to reveal information the state could not otherwise extract without the subject's cooperation. Third, even where a technique escapes the strict scope of Article 20(3), it must independently satisfy Article 21's requirement of a fair, just, and reasonable procedure, which imports proportionality, necessity, and least-intrusiveness as constitutional tests. This tripartite structure testimonial/physical distinction, mental-privacy protection, and substantive due process review provide the doctrinal architecture within which the mandatory forensic investigation regime under the BNSS must be assessed.

Table 1: Constitutional Safeguards Relevant to Forensic Investigation

Constitutional Provision	Core Guarantee	Relevance to Forensic Investigation
Article 14	Equality before law; protection against arbitrariness	Bars arbitrary or discriminatory selection of persons for forensic testing
Article 20(3)	Privilege against self-incrimination	Bars compelled testimonial communication; core safeguard against narco-analysis, polygraph and BEAP without consent
Article 21	Right to life and personal liberty	Protects bodily integrity, dignity, and mental privacy; imports fair-procedure and proportionality review
Article 21 (Privacy)	Informational and decisional privacy (Puttaswamy)	Extends protection to bodily and mental data generated through forensic techniques
Article 22	Protection against arbitrary arrest and detention	Frames procedural conditions under which samples may be sought from a detained accused
Article 20(1)	Protection against ex post facto laws	Relevant where forensic mandate is applied retrospectively to pending investigations

Source: Compiled by author from the Constitution of India and settled Supreme Court jurisprudence.

8. Mandatory Forensic Investigation under the BNSS, BNS and Bharatiya Sakshya Adhiniyam

The Bharatiya Nagarik Suraksha Sanhita, 2023, the Bharatiya Nyaya Sanhita, 2023, and the Bharatiya Sakshya Adhiniyam, 2023 came into force on 1 July 2024, replacing the Code of Criminal Procedure, 1973, the Indian Penal Code, 1860, and the Indian Evidence Act, 1872 respectively. Together, these three statutes reconstitute the procedural, substantive, and evidentiary architecture of Indian criminal law, and each contributes distinctly to the mandatory forensic investigation regime.

8.1 Section 176(3) BNSS — The Core Mandate

Section 176(3) BNSS provides that, on receipt of information relating to the commission of an offence punishable with imprisonment of seven years or more, the officer in charge of a police station shall, from a date to be notified by the State Government within a period of five years, cause a forensic expert to visit the crime scene to collect forensic evidence, and cause videography of that process on a mobile phone or other electronic device. Where forensic facilities are unavailable in the State for a given offence category, the State Government must notify the utilisation of facilities from another State until domestic capacity is developed. This provision converts what was, under the former Code, a matter of investigative discretion into an enforceable statutory obligation, while simultaneously building in an extended, capacity-linked transition period that acknowledges the very infrastructural constraints examined in Section 11 of this paper.

8.2 Section 349 BNSS — Sample Collection Powers

Section 349 BNSS expands the powers of a Magistrate of the first class to direct any person, including a person who is not under arrest, to give specimen signatures, handwriting, fingerprints, palm prints, voice samples, or other physical samples for the purpose of an investigation, on written application by a police officer. This provision broadens the scope of the corresponding Section 311A of the former Code, most notably by extending coverage to voice samples, and situates the constitutional analysis of compelled sampling squarely within a judicially supervised, rather than purely executive, process.

8.3 Section 176(3) Read with BNS Sentencing Structure

Because the seven-year threshold in Section 176(3) BNSS is defined by reference to the punishment prescribed for an offence, its practical reach is determined by the sentencing architecture of the Bharatiya Nyaya Sanhita, 2023. The BNS retains and, in several instances, enhances custodial sentencing ranges for offences such as culpable homicide, rape, robbery, dacoity, and organised crime, meaning that the mandatory forensic threshold captures a substantial proportion of India's serious and cognizable offence caseload, thereby generating significant downstream demand on forensic laboratory capacity.

8.4 The Bharatiya Sakshya Adhiniyam, 2023 — Evidentiary Recognition

The Bharatiya Sakshya Adhiniyam, 2023 complements the investigative mandate by expanding the evidentiary status of electronic and digital records, placing them on a footing comparable to primary documentary evidence subject to prescribed certification requirements, and by retaining and consolidating provisions on expert opinion under what was previously Section 45 of the Indian Evidence Act. Read together, the BSA ensures that forensic material collected under the Section 176(3) mandate is capable of admission at trial, closing the loop between mandatory collection and evidentiary use, while continuing to require judicial evaluation of the weight and voluntariness of any statement-based forensic technique.

Table 2: Evolution of Forensic Investigation Law in India

Period	Governing Instrument	Status of Forensic Investigation
1861–1972	Code of Criminal Procedure, 1861/1898; Identification of Prisoners Act, 1920	Fingerprinting and identification largely confined to convicted/arrested persons; forensic science institutionally nascent
1973–2023	Code of Criminal Procedure, 1973 (Sections 53, 53A, 164A, 311A)	Forensic examination permitted but discretionary; medical examination of accused in specified offences; no crime-scene mandate
2005	CrPC (Amendment) Act, 2005	Introduced Section 53A (rape) and Section 164A (medical examination of rape victim); expanded DNA-related sampling powers
2020	DNA Technology (Use and Application) Regulation Bill (proposed)	Sought a national DNA data bank; lapsed without enactment amid privacy concerns
2023–2024	BNSS, BNS, Bharatiya Sakshya Adhiniyam, 2023 (in force 1 July 2024)	Section 176(3) BNSS makes forensic crime-scene investigation mandatory for offences punishable with 7+ years; Section 349 BNSS expands sample-collection powers; BSA formalises electronic/expert evidence
2024–2029	National Forensic Infrastructure Enhancement Scheme	Five-year implementation window; expansion of NFSU campuses and CFSLs to build capacity for the new mandate

Source: Compiled by author from statutory texts and Ministry of Home Affairs records.

Figure 1: Criminal Investigation Process under BNSS (Serious Offences)

Information/FIR under Section 173 BNSS (Cognizable Offence)

↓

Preliminary Assessment — Offence Punishable with 7 Years or More?

↓

Mandatory Forensic Expert Visit to Crime Scene (Section 176(3) BNSS) + Videography

↓

Sample Collection under Judicial Authorisation (Section 349 BNSS, where applicable)

↓

Forensic Laboratory Examination and Report

↓

Filing of Final Report/Chargesheet (Section 193 BNSS) Incorporating Forensic Evidence

↓

Admission of Forensic and Electronic Evidence at Trial (Bharatiya Sakshya Adhiniyam)

Figure 1: Author's construction based on Sections 173, 176(3), 193 and 349 BNSS, 2023.

Table 3: Key Mandatory and Discretionary Forensic Provisions under BNSS

Section	Subject Matter	Nature of Power
176(1)–(2)	General procedure for investigation and periodic reporting to Magistrate	Discretionary/administrative
176(3)	Mandatory forensic expert visit to crime scene for offences punishable with 7+ years, with videography	Mandatory (subject to 5-year State notification)
185	Search of place by police officer	Discretionary, subject to recording of grounds
193	Report of police officer on completion of investigation	Mandatory; must reflect forensic findings where applicable
233	Examination of accused by medical practitioner at request of arrested person	Discretionary/accused-initiated
253	Voluntary forensic/medical examination at defence stage	Voluntary; no indefeasible right to demand
349	Magisterial power to direct specimen signatures, handwriting, fingerprints, voice samples	Mandatory upon Magistrate's written order; judicially supervised
531	Repeal and savings; transitional application to pending matters	Administrative/transitional

Source: Compiled by author from the Bharatiya Nagarik Suraksha Sanhita, 2023.

9. SYSTEMIC BOTTLENECKS IN INDIA

The statutory conversion of forensic investigation from a discretionary practice into a binding duty has occurred against the backdrop of a forensic infrastructure that independent audits describe as chronically strained. This section maps the principal bottlenecks across four stages of the forensic evidence chain: crime-scene collection, laboratory examination, human resource capacity, and judicial disposal.

9.1 Crime-Scene Collection Bottlenecks

Field-level reviews of Indian crime-scene practice consistently report inadequately trained first responders, contamination of samples prior to laboratory receipt, improper packaging and chain-of-custody documentation, and continued reliance on confession-based investigation in preference to forensic collection. Because Section 176(3) BNSS requires video graphic documentation of the collection process itself, an absence of standard operating procedures for the conduct and storage of such video record introduces a secondary compliance risk distinct from the underlying forensic mandate.

9.2 Laboratory Capacity Bottlenecks

India's forensic laboratory network is organized as a hub-and-spoke system comprising seven Central Forensic Science Laboratories operating under the Directorate of Forensic Science Services, more than thirty State Forensic Science Laboratories, and numerous Regional Forensic Science Laboratories of variable capability. Ministry of Home Affairs disclosures to Parliament record that the seven Central Forensic Science Laboratories together received a cumulative caseload running into several tens of thousands of cases over the five years to October 2024, with several thousand cases pending examination at any given time. Independent audit work has found vacancy rates of roughly forty per cent across surveyed laboratories, concentrated disproportionately among scientific rather than administrative posts, alongside underutilization of modernization funding attributable to fragmented administrative control between police and home departments.

9.3 Human Resource and Training Bottlenecks

The shortage of qualified forensic scientists, DNA analysts, and digital forensic examiners has been a persistent constraint. The National Forensic Sciences University has been designated as the principal institution for building a pipeline of trained personnel, and the National Forensic Infrastructure Enhancement Scheme, approved in 2024 with a multi-year financial outlay running into several thousand crore rupees, envisages nine additional NFSU campuses and new Central Forensic Science Laboratories across several States. These measures, however, operate on a multi-year time horizon that trails the statutory mandate's five-year implementation clock.

9.4 Judicial Disposal and Case Pendency Bottlenecks

Delay in forensic examination compounds delay in trial disposal. National Judicial Data Grid figures reflect substantial pendency of criminal cases at the trial court level nationally, a proportion of which is attributable to prosecutions awaiting forensic reports. The 2025 India Justice Report's finding that under trial prisoners constitute roughly three-quarters of the total prison population is, on this reading, partly a downstream consequence of an evidentiary pipeline that remains slower than the statutory and constitutional expectation of a speedy trial under Article 21.

Table 4: Illustrative State-wise Forensic Science Laboratory Infrastructure

State/UT (Illustrative)	State FSL	Regional/Divisional FSLs (approx.)	Reported Capacity Concern
Maharashtra	1 (Mumbai)	6–8	High caseload relative to sanctioned scientific posts
Uttar Pradesh	1 (Lucknow)	8–10	Large pendency; recruitment drives ongoing (2025–26)
Tamil Nadu	1 (Chennai)	4–6	Comparatively better DNA capacity; digital

State/UT (Illustrative)	State FSL	Regional/Divisional FSLs (approx.)	Reported Capacity Concern
			forensics gap
Delhi	1 (Rohini)	—	High caseload density per capita; frequent contractual hiring
Bihar	1 (Patna)	2–3	Among States prioritised for new CFSL under 2024 Scheme
North-Eastern States (composite)	Variable/shared	Limited	Heavy reliance on referral to CFSLs outside the region
Gujarat	1 (Gandhinagar, co-located with NFSU)	4–5	Relatively stronger institutional linkage via NFSU

Source: Author's compilation from Ministry of Home Affairs parliamentary responses, DFSS records, and secondary reporting; figures are illustrative approximations rounded for comparative presentation and subject to periodic revision by the concerned authorities.

Table 5: Major Systemic Bottlenecks in Mandatory Forensic Investigation

Stage	Bottleneck	Consequence
Crime-scene collection	Untrained first responders; contamination; inconsistent video graphic practice	Compromised evidentiary integrity; possible exclusion at trial
Laboratory examination	40–50% staff vacancy; equipment shortage; funding underutilization	Multi-month to multi-year case pendency
Human resources	Shortage of DNA analysts, digital forensic examiners, forensic psychologists	Backlogs concentrated in high-value evidence categories
Inter-state disparity	Uneven laboratory density; some States reliant on out-of-state referral	Delay disproportionately affects less-resourced States
Administrative fragmentation	Divided control between police and home departments	Slow budget release; inconsistent quality standards
Enforcement gap	No statutory consequence specified for non-compliance with Section 176(3)	Risk that mandate remains aspirational absent judicial enforcement
Coercion risk	Pressure to secure evidence quickly may incentivise shortcuts	Elevated risk of constitutional violation under Article 20(3)/21

Source: Compiled by author from Project 39A (2023), India Justice Report (2025), and MHA parliamentary disclosures.

Figure 2: Systemic Bottlenecks Flowchart — From Crime Scene to Trial

Crime Scene: Untrained First Responders / Contamination Risk
↓
Transport & Chain of Custody: Documentation Gaps
↓
FSL Intake: 40–50% Staff Vacancy, Equipment Shortage
↓
Examination Backlog: Months to Years of Pendency
↓
Delayed Chargesheet/Trial Adjournments
↓
Prolonged Undertrial Detention; Article 21 Speedy-Trial Concern

Figure 2: Author's construction based on data synthesised in Tables 4 and 5.

10. COMPARATIVE STUDY

A comparative review of four jurisdictions the United Kingdom, the United States, Australia, and Germany illuminates alternative institutional models for reconciling mandatory or routine forensic sampling with constitutional or rights-based protection against compelled self-incrimination.

10.1 United Kingdom

The Police and Criminal Evidence Act 1984 (PACE) and its associated Codes of Practice structure the taking of intimate and non-intimate samples in England and Wales. Non-intimate samples, such as fingerprints or non-intimate DNA swabs, may be taken without consent from a person in police detention on the authorisation of an officer of at least the rank of inspector, in defined circumstances, while intimate samples generally require either consent or a similar authorisation with additional safeguards. The United Kingdom has no single written constitutional privilege against self-incrimination equivalent to Article 20(3); rather, protection is distributed across the common-law right to silence, PACE's procedural safeguards, and Article 6 of the European Convention on Human Rights as incorporated by the Human Rights Act 1998, which the European Court of Human Rights has read to prohibit the use of adverse inferences or coerced material that undermines the fairness of the trial as a whole, as established in cases such as Saunders v United Kingdom.

10.2 United States

United States constitutional practice separates the Fourth Amendment's protection against unreasonable searches and seizures from the Fifth Amendment's privilege against self-incrimination, a structural division broadly analogous to the Indian split between Article 21 and Article 20(3). In Schmerber v California (1966), the Supreme Court held that compelled extraction of a blood sample did not violate the Fifth Amendment because it was physical rather than testimonial evidence, but required a warrant or a recognised exception under the Fourth Amendment. Missouri v McNeely (2013) subsequently held that the natural dissipation of alcohol in the bloodstream does not, by itself, constitute a per se exigency justifying a warrantless blood draw, reinforcing a case-by-case proportionality assessment. Compelled psychological or narco-analytic techniques, by contrast, have been treated with far greater judicial suspicion and are generally inadmissible as unreliable and testimonially coercive.

10.3 Australia

Australian criminal procedure is governed at the State and Territory level by forensic procedure statutes such as the Crimes (Forensic Procedures) Act 2000 (NSW) and comparable legislation elsewhere, which distinguish 'intimate' from 'non-intimate' forensic procedures and generally require either informed consent or an order of a senior police officer or magistrate, calibrated to the seriousness of the offence and the intrusiveness of the procedure. Australia lacks a national constitutional bill of rights, so protection against compelled self-incrimination rests primarily on the common-law privilege, statutory forensic procedure codes, and the uniform Evidence Acts' discretion to exclude improperly or unfairly obtained evidence, giving courts a flexible but less predictable safeguard than a codified constitutional right.

10.4 Germany

Germany's Strafprozessordnung (Code of Criminal Procedure), particularly Sections 81a and 81c, permits bodily examination of an accused, including blood samples, without consent where ordered by a judge (or, in exigent circumstances, a prosecutor), subject to a proportionality requirement rooted in the constitutional guarantee of human dignity under Article 1 and the general right of personality under Article 2(1) of the Basic Law (Grundgesetz). German doctrine draws a sharp distinction between compelled bodily intrusion, which is permissible under judicial control and proportionality review, and compelled psychological or narcotic interrogation techniques, which German courts have consistently treated as incompatible with human dignity and therefore absolutely, rather than conditionally, prohibited a position structurally similar to the Indian Court's treatment of narco-analysis in Selvi.

Table 6: Comparative Constitutional Analysis of Forensic Investigation Powers

Jurisdiction	Governing Framework	Compelled Bodily Sampling	Compelled Psychological/Narco Techniques	Judicial Oversight
India	Art. 20(3) & 21 Constitution; Section 349 BNSS	Permitted with Magisterial order (specimen/voice samples)	Prohibited without free, informed consent (Selvi; Amlesh Kumar)	Magistrate for sampling; Court for narco-analysis requests
United Kingdom	PACE 1984; Human Rights Act 1998, Art. 6 ECHR	Non-intimate samples without consent (senior officer authorisation); intimate samples generally need consent	No formal narco-analysis regime; fairness test under Art. 6	Police authorisation with statutory codes; ECtHR fairness review
United States	4th & 5th Amendments	Permitted with warrant/exception (Schmerber; McNeely)	Presumptively inadmissible as unreliable/coercive	Judicial warrant requirement; case-by-case exigency review
Australia	State Forensic Procedures Acts; common law privilege	Consent or senior officer/magistrate order, tiered by intrusiveness	No dedicated statutory regime; excluded under unfairness discretion	Senior police officer or magistrate, tiered by procedure type
Germany	StPO ss81a, 81c; Basic Law Arts. 1, 2(1)	Judicial order permitted; proportionality-tested	Absolutely prohibited as violation of human dignity	Judge (or prosecutor in exigency), proportionality review

Source: Compiled by author from the cited national statutes and case law.

11. CONSTITUTIONAL CHALLENGE TO SELF-INCRIMINATION

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The core constitutional tension examined in this paper arises where the mandatory forensic investigation regime intersects with techniques that require the accused's bodily or mental participation. Three categories of forensic technique warrant separate treatment.

11.1 Physical/Identificatory Evidence

Fingerprints, palm prints, specimen handwriting, blood typing, and DNA profiling drawn from bodily material fall, under the Kathi Kalu Oghad line of authority, outside the scope of 'being a witness against oneself' because they do not require the accused to communicate personal knowledge; the evidentiary value lies in objective physical comparison rather than in any statement made by the accused. Compelled production of such material, when authorised by a Magistrate under Section 349 BNSS and subject to procedural safeguards, is generally constitutionally permissible, subject to Article 21's requirement that the manner of compulsion itself be fair, non-degrading, and proportionate to the offence under investigation.

11.2 Testimonial Compulsion in the Course of Investigation

Nandini Satpathy v P.L. Dani extended Article 20(3) protection beyond the courtroom to police interrogation, holding that an accused cannot be compelled to answer questions that have a reasonable tendency to incriminate, even where the answer might appear innocuous in isolation, because it may furnish a link in a chain of evidence. This principle constrains investigative practice under Section 180 BNSS (recording of statements during investigation), requiring that statements be genuinely voluntary and that silence not be treated as an admission or ground for adverse inference.

11.3 Neuro-Scientific and Psychological Techniques

Narco-analysis, polygraph examination, and brain-electrical activation profiling occupy the most constitutionally fraught category. In Selvi v State of Karnataka (2010), the Supreme Court held that involuntary administration of these techniques violates both Article 20(3), because the resulting output is testimonial in character notwithstanding its unconventional form, and Article 21, because it involves an unwarranted intrusion into mental privacy and personal autonomy that cannot be justified merely by state interest in efficient investigation. The Court held that even results obtained with consent are not, by themselves, admissible as substantive evidence of guilt, though any subsequent physical discovery made as a result of information supplied during the course of the test may be admissible under the doctrine analogous to Section 27 of the erstwhile Evidence Act, now preserved in comparable terms within the Bharatiya Sakshya Adhiniyam. This qualified treatment of derivative discovery, while consent-based access remains available, reflects an attempt to balance investigative utility against the near-absolute protection accorded to compelled mental processes.

Figure 3: Constitutional Rights versus Investigation Powers — A Balancing Framework

STATE INTEREST: Effective, Scientific, Speedy Investigation (Art. 21 — Victims & Society)
↓
PROPORTIONALITY & NECESSITY TEST
↓
Physical/Identificatory Evidence — Permitted with Magisterial Order (Kathi Kalu Oghad)
↓
Testimonial Statements — Protected; Must be Free & Voluntary (Nandini Satpathy)
↓
Neuro-Scientific/Psychological Techniques — Prohibited Without Free, Informed Consent (Selvi; Amlesh Kumar)

Figure 3: Author's construction illustrating the graduated constitutional treatment of forensic techniques from least to most intrusive.

12. JUDICIAL ANALYSIS

The evolution of Indian judicial doctrine on forensic self-incrimination can be read as a progressive tightening of protection around the accused's mental autonomy, even as the Court has remained comparatively permissive toward compelled physical sampling.

12.1 State of Bombay v Kathi Kalu Oghad (1961)

An eleven-judge Bench held that the prohibition in Article 20(3) is confined to testimonial compulsion and does not extend to the taking of specimen handwriting, fingerprints, or signatures for identification or comparison purposes, since such material does not by itself convey the accused's personal knowledge of facts. This decision remains the foundational authority permitting compelled physical sampling under judicial supervision.

12.2 Nandini Satpathy v P.L. Dani (1978)

The Supreme Court held that Article 20(3)'s protection applies at the stage of police interrogation and not merely at trial, and that an accused may decline to answer questions with a reasonable likelihood of exposing them to criminal liability, extending the privilege's practical reach well into the investigative process and imposing a duty on investigating officers to inform the accused of this right.

12.3 Selvi v State of Karnataka (2010)

A three-judge Bench comprehensively examined narco-analysis, polygraph testing, and brain-electrical activation profiling, holding that involuntary administration of these techniques amounts to 'testimonial compulsion' attracting Article 20(3) protection, and separately violates the right to privacy, dignity, and mental integrity guaranteed under Article 21. The Court further held that even voluntarily obtained results carry no independent evidentiary value as proof of guilt, though derivative physical discoveries may be admissible subject to established safeguards. Selvi remains the controlling precedent on this question.

12.4 Justice K.S. Puttaswamy (Retd.) v Union of India (2017)

A nine-judge Bench unanimously recognised the right to privacy as intrinsic to Article 21, encompassing informational privacy, bodily integrity, and decisional autonomy, and required that any state intrusion satisfy a threefold test of legality, legitimate aim, and proportionality. Although Puttaswamy did not directly concern forensic investigation, its articulation of the proportionality standard has since informed lower court and academic assessment of how far mandatory forensic sampling under Section 176(3) and Section 349 BNSS can extend before it becomes constitutionally excessive.

12.5 Tofan Singh v State of Tamil Nadu (2021)

A three-judge Bench held, in the context of the Narcotic Drugs and Psychotropic Substances Act, 1985, that officers invested with powers of an officer-in-charge of a police station are 'police officers' for the purposes of Section 25 of the Indian Evidence Act, rendering confessional statements recorded by them inadmissible. The decision reinforces a broader constitutional wariness toward statements obtained under circumstances of institutional or psychological pressure, a concern directly relevant to the reliability and admissibility of forensic-adjacent statements gathered during mandatory investigation.

12.6 Amlesh Kumar v State of Bihar (2025) and Recent High Court Practice

In 2025, the Supreme Court set aside a Patna High Court order that had permitted narco-analysis testing of accused persons at the bail stage, holding that such a direction was contrary to Selvi and violated Articles 20(3) and 21, and clarifying that a bail hearing is confined to assessing prima facie allegations and the risk of interference with justice rather than a forum for authorising investigative procedures. The Court reaffirmed that narco-analysis may only be undertaken with free and informed consent, that voluntary testing at the defence-evidence stage under Section 253 BNSS does not amount to an indefeasible right to demand such a test, and that even consensual results require independent corroboration and cannot alone sustain a conviction. Coordinate reasoning has appeared in subsequent decisions reiterating that results of consensual narco-analysis carry no independent evidentiary value absent corroboration. Collectively, these post-BNSS decisions confirm that the mandatory forensic investigation regime introduced in 2024 has not diluted, and indeed has been judicially read alongside, the pre-existing constitutional prohibition on involuntary neuro-scientific testing.

Table 7: Landmark Supreme Court Decisions on Forensic Evidence and Self-Incrimination

Case	Year	Core Holding
State of Bombay v Kathi Kalu Oghad	1961	Compelled specimen handwriting/fingerprints not testimonial; Art. 20(3) inapplicable to physical identification evidence

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Case	Year	Core Holding
Nandini Satpathy v P.L. Dani	1978	Art. 20(3) protection extends to police interrogation stage; accused may refuse incriminating questions
Selvi v State of Karnataka	2010	Involuntary narco-analysis, polygraph and BEAP violate Art. 20(3) and Art. 21; consensual results not independently probative
Justice K.S. Puttaswamy (Retd.) v Union of India	2017	Right to privacy intrinsic to Art. 21; proportionality test (legality, legitimate aim, proportionality) for state intrusion
Tofan Singh v State of Tamil Nadu	2021	Officers with police-officer powers under special statutes cannot record admissible confessions; reinforces anti-coercion principle
Amlesh Kumar v State of Bihar	2025	Reaffirms Selvi under BNSS regime; narco-analysis at bail stage impermissible; no indefeasible right to demand test under Section 253 BNSS

Source: Compiled by author from official law reports and Supreme Court judgments.

13. EMPIRICAL DATABASE ANALYSIS

This section synthesises publicly available data from the National Crime Records Bureau, the Directorate of Forensic Science Services, the Ministry of Home Affairs, the National Judicial Data Grid, and the Bureau of Police Research and Development to assess the empirical scale of the implementation challenge facing Section 176(3) BNSS. Because these sources report at different levels of granularity and are updated on different cycles, the figures below are presented as illustrative, order-of-magnitude indicators rather than as a precise real-time census, and are intended to demonstrate the structure of the bottleneck rather than to support point-estimate policy conclusions.

Three findings emerge consistently across sources. First, the aggregate national pendency of forensic examinations has historically run into several hundred thousand cases even at pre-BNSS referral rates of roughly ten to twelve per cent of registered cognizable offences; because Section 176(3) BNSS converts referral from a discretionary tenth of cases into a mandatory requirement for the entire category of offences carrying seven-year-plus punishment, the reform is likely to multiply laboratory intake several-fold within the current five-year transition window. Second, staffing vacancy, historically documented at around forty per cent across audited laboratories and estimated at close to fifty per cent in the most recent nationwide justice-sector audit, constitutes the single largest constraint on throughput, exceeding equipment or funding shortfalls in relative significance. Third, the geographic distribution of laboratory capacity is markedly uneven, with several States and Union Territories, particularly in the North-East and parts of the Hindi heartland, structurally dependent on referral to Central Forensic Science Laboratories outside their own jurisdiction, generating additional transit and turnaround delay.

The Government's response, principally the National Forensic Infrastructure Enhancement Scheme approved in 2024 with a multi-year outlay running into the low thousands of crores of rupees, envisages nine additional National Forensic Sciences University campuses and eight new Central Forensic Science Laboratories across Jammu and Kashmir, Rajasthan, Tamil Nadu, Bihar, Uttar Pradesh, Odisha, Chhattisgarh, and Kerala. This expansion, while substantial in nominal terms, is calibrated to a multi-year construction and staffing timeline that runs concurrently with, rather than clearly ahead of, the five-year statutory implementation clock under Section 176(3), creating a structural risk that several States will reach their notified compliance date before proportionate laboratory capacity is in place.

Figure 4: Mandatory Forensic Investigation Framework Capacity versus Demand

DEMAND SIDE: All Offences Punishable with 7+ Years Now Require Mandatory Forensic Crime-Scene Visit (Sec. 176(3) BNSS)

↓

Pre-BNSS Baseline Referral: 10–12% of Registered Cognizable Offences Reached FSLs

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↓

Projected Post-BNSS Referral: Substantially Higher Share of Serious-Offence Caseload

↓

SUPPLY SIDE: 40–50% Scientific Staff Vacancy; 7 CFSLs, 30+ SFSLs, Limited Regional FSLs

↓

RESPONSE: National Forensic Infrastructure Enhancement Scheme (2024–2029) 9 New NFSU Campuses, 8 New CFSLs

Figure 4: Author's construction based on data synthesised from MHA, DFSS, NFSU and Project 39A sources.

14. POLICY RECOMMENDATIONS

Reconciling the mandatory forensic investigation regime with constitutional guarantees and institutional reality requires reform at the legislative, executive, and judicial levels simultaneously. The following recommendations are structured around the bottlenecks and doctrinal gaps identified in Sections 11 through 15.

Phased, capacity-linked notification: State notifications under Section 176(3) BNSS should be sequenced against independently verified laboratory capacity benchmarks rather than a uniform five-year deadline, with interim reporting to a central oversight body.

Statutory consequence for non-compliance: Parliament or the judiciary should clarify the evidentiary and disciplinary consequences of non-compliance with Section 176(3), to prevent the mandate from operating as an aspirational provision without enforcement teeth.

Ring-fenced forensic budgeting: Forensic science laboratories should be administratively delinked from state police budgets and placed under direct home department or an autonomous forensic authority's financial control, to address the underutilisation and delayed fund-release problems documented by Project 39A.

National standard operating procedures for videography: The Bureau of Police Research and Development, in coordination with the Directorate of Forensic Science Services, should issue binding protocols for the conduct, storage, and chain-of-custody treatment of the videographic record mandated under Section 176(3).

Codified consent and safeguard protocol for neuro-scientific techniques: Statutory rules, consistent with Selvi and Amlesh Kumar, should codify the requirement of written, informed, judicially recorded consent, presence of counsel, and independent medical supervision before any narco-analysis, polygraph, or BEAP procedure is conducted, even on a voluntary basis.

Judicially supervised proportionality checklist for sample collection: Magistrates exercising powers under Section 349 BNSS should be guided by a structured proportionality checklist offence severity, availability of alternative evidence, and intrusiveness of the specific procedure drawing on the German and Australian graduated models.

Integrated national forensic data architecture: A unified digital case-management and laboratory-tracking system, linking police stations, forensic laboratories, and courts, should be developed to enable real-time monitoring of pendency and compliance with statutory timelines.

Accelerated human resource pipeline: Recruitment and training targets under the National Forensic Infrastructure Enhancement Scheme should be brought forward to precede, rather than trail, State notification dates under Section 176(3).

Table 8: Policy Recommendations Matrix

Recommendation	Responsible Authority	Bottleneck/Doctrine Addressed	Priority
Phased, capacity-linked notification schedule	State Governments / MHA	Infrastructure-mandate mismatch (Section 11, 15)	High
Statutory consequence for non-	Parliament /	Enforcement gap (Table 5)	High

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Recommendation	Responsible Authority	Bottleneck/Doctrine Addressed	Priority
compliance	Judiciary		
Ring-fenced forensic budgeting and administrative autonomy	MHA / State Home Departments	Fund underutilisation, fragmentation (Table 5)	High
National SOP for crime-scene videography and chain of custody	BPR&D / DFSS	Collection-stage bottleneck (Table 5)	Medium
Codified consent protocol for neuro-scientific techniques	Parliament / Law Commission	Selvi/Amlesh Kumar compliance (Section 13, 14)	High
Structured proportionality checklist for Magistrates (Sec. 349 BNSS)	Judiciary / Judicial Academies	Article 21 proportionality (Section 9, 13)	Medium
Integrated national forensic case-tracking system	NCRB / NJDG / DFSS	Data fragmentation, pendency monitoring	Medium
Accelerated NFSU/CFSL recruitment and training pipeline	NFSU / MHA	Human resource shortage (Table 5)	High

Source: Author's analysis, synthesising findings from Sections 11–15 of this paper.

Figure 5: Proposed Integrated National Forensic Model

TIER 1 — Legislative Layer: BNSS/BNS/BSA + Codified Consent Rules for Neuro-Scientific Techniques

↓

TIER 2 — Institutional Layer: Autonomous National Forensic Authority Coordinating CFSLs, SFSLs, NFSU

↓

TIER 3 — Operational Layer: Standardised SOPs for Collection, Videography, Chain of Custody

↓

TIER 4 — Digital Layer: Integrated Case-Tracking Linking Police, FSLs, and Courts (NJDG-Linked)

↓

TIER 5 — Oversight Layer: Judicial Proportionality Review + Parliamentary Reporting on Compliance

Figure 5: Author's proposed integrated model synthesising the comparative and doctrinal analysis in Sections 12–14.

15. CONCLUSION

Section 176(3) of the Bharatiya Nagarik Suraksha Sanhita, 2023 marks a genuine and overdue shift toward scientific investigation in India, addressing a long-standing overreliance on testimonial evidence that has contributed to both wrongful acquittals and wrongful convictions. Read together with the Bharatiya Nyaya Sanhita's sentencing structure and the Bharatiya Sakshya Adhiniyam's expanded recognition of forensic and electronic evidence, the 2023 codes create, for the first time, a coherent statutory pathway from mandatory crime-scene forensic collection to admissible trial evidence. This reform, however, is only as strong as the institutional capacity that supports it, and the evidence reviewed in this paper vacancy rates approaching half of sanctioned scientific posts, laboratory pendency running into hundreds of thousands of cases, and pronounced inter-state disparity in forensic infrastructure suggests that the five-year implementation window, while a pragmatic legislative concession to institutional reality, does not by itself resolve the underlying capacity deficit.

The constitutional analysis undertaken in this paper demonstrates that Indian jurisprudence has developed a workable, if not always perfectly predictable, framework for distinguishing constitutionally permissible forensic intervention from impermissible testimonial compulsion. Physical and identificatory evidence, obtained under judicial authorisation, remains compatible with Article 20(3) under the Kathi Kalu Oghad line of authority. Testimonial statements obtained during investigation remain protected under Nandini Satpathy. Neuro-scientific and psychological techniques narco-analysis, polygraph examination, and brain-electrical activation profiling remain subject to the near-absolute prohibition on involuntary administration established in Selvi and reaffirmed as recently as 2025 in Amlesh Kumar v State of Bihar, confirming that the mandatory forensic investigation regime introduced by the BNSS has not diluted, and cannot constitutionally dilute, this protection. The comparative study of the United Kingdom, the United States, Australia, and Germany reveals a broadly convergent global pattern: judicial or magisterial oversight of compelled bodily sampling, calibrated to offence severity and procedural intrusiveness, coupled with strong in Germany's case, absolute protection against compelled psychological interrogation techniques.

The path forward, as outlined in the policy recommendations of Section 18, lies not in choosing between investigative efficiency and constitutional protection, but in building an institutional architecture properly funded, administratively autonomous, procedurally standardised, and digitally integrated capable of discharging the mandatory forensic mandate without recourse to the coercive shortcuts that Indian constitutional law has consistently and correctly foreclosed. A forensic system that is both scientifically credible and constitutionally compliant is not only achievable but necessary if the promise of Section 176(3) BNSS is to be realised in substance and not merely in statutory text.

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