



## **STANDARDIZATION OF FORENSIC EVIDENCE ITS PROCUREMENT PRESERVATION AND PRESENTATION IN COURT OF LAW USING FBI TECHNIQUES BY FIA**

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### **Abstract**

The purpose of this paper is to present the some feasible standards used by US Federal Bureau of investigation (FBI) to enable Federal Investigation Agency (Pakistan) to enhance the authenticity of evidence and its consistency with the existing law. There are examples of several hundred cases, where the courts refused to punish the offender due to unauthentic inconsistent or naive evidence. The investigator is normally responsible to procure and preserve the forensic evidence to strengthen the case of the prosecutor. The investigator has follow up the legal procedure, technically in technically correct manner and consistent with provisions of Law, circumstantial and oral evidence. The inherent deficiencies and faults render the forensic evidence invalid sometimes and no use in the court. The approach of the paper is to standardise and synchronise the working as for as dealing with forensic evidence is concerned. The FBI provides very useful methodologies for procuring evidence from the sponce of offence, forensic services, examination of evidence, rendering forensic evidence,

**Keywords:** Chemistry forensic examination, Evidence Act, Documentary Evidence

### **1. Introduction:**

**T**his paper deals with highlighting the need for enhancing the quality of forensic evidence by FIA and using the technologies used by FBI. The manpower for effectively handling the tasks involved in collecting, testing and using the forensic evidence is not adequate. The FIA lacks qualified and skilful manpower for the tasks under discussion. A brief resume is presented in section 2 to strengthen the manpower. The present authors have been projecting the important factors regarding effectively presenting the forensic evidence, in various published research papers.

The effective mannerism by prosecutors to support the digital forensic evidence has been discussed in [1] and how to present it in court of law. In [2] a detailed presentation is given on DNA Fingerprints, Facial Prints and other Digital Forensics as Evidence in Criminal Investigation and Court Proceedings to make the prosecution case stronger. The paper [3] prescribes and advocates the "use of codes in place of Fingerprints images during image processing for Criminal Information in large Databases and Data warehouses to reduce Storage, enhance efficiency and processing speed". The facial images also play important role is preserving the criminal information. It is advocated in [4] using an algorithm, to store the

criminal information by means of codes instead of facial images to speed up and enhance the working and capability of criminal Databases and Data Ware houses. The algorithm also reduces the storage requirements and accommodates all particulars of criminal information required efficiently. Another useful algorithm has been designed by [5] which effectively uses codes in place of criminal names in the databases and data warehouses to quickly retrieve the criminal information using unique key like name code. The contribution made in the development of algorithms presented in [6], [7] and [8] makes the storage and retrieval of criminal information from databases using fingerprints and/or criminal appearance must easier and direct.

## **2. Kinds of Forensic Evidence for processing**

Apart from oral and documentary evidence, there are several types of forensic evidence, which are processed and formulated by the investigator for the prosecution. For example the Blood Spatter, DNA evidence, Fingerprints, Ballistics, Autopsies, fibers, firearm residues, photographs or videos photographs, receipts of bank and Entomology. The investigator collects forensic evidence from different sources and different forms, but one has to convert into legally presentable form for court proceedings. For most of the forensic evidence processing require expertise from chemists, biologists or the experts in other field discussed in section 4 of this paper. The inadmissible forensic evidence is of no use in the court of law because [9] such evidence can neither prove nor disprove the facts or circumstances of the case.

The admissibility of evidence has to look into the criteria prescribed and mentioned in PPC and CRPC. In criminal law, the evidence must be capable of proving the offence without any doubt. However, in civil proceeding the case is judged by the "standards of preponderance of the evidence. The authors of this paper are of the opinion that the investigating personnel must prepare the evidence in form which is admissible. According to [10], the document or testimony is admissible in court which can prove the case of prosecution in court of law and is not deviant.

Other important area in preparing the forensic

evidence discussed in [11] and [12] is of practical importance; accordingly the expressions used in text must legally be consistent. The oral and signed evidence need to be properly drafted and crafted particularly telephone calls, ransom notes, dying declarations and other items. The description of threats, bribes, conspiracy or perjury must also be carefully represented in the text of the statement. Any inconsistency may render the evidence to be inadmissible. Similarly the wording of Confession, Interrogation, and Deception must also be carefully handled [12].

The important factors while preparation of the forensic evidence, which makes it admissible in court, must be indeed relevant to the case, real, credible, believable and reliable.

Drafting and preparing evidence based on unfair, prejudicial approach, misleading contents which wastes time of court and prosecutor, depend upon "hear say" contents may rendered inadmissible in the court and cannot be used in the court. Therefore the evidence must be analysed and review before presentation in the court.

## **3. The Role of Forensic Chemistry and Forensic Biology**

The forensic Toxicology has been playing pivotal role in conjunction with Forensic Chemistry; similarly the field of Biochemistry is of immense importance in the works related to forensic evidence. The identification and determination of unknown materials is carried out by forensic Chemist using various methods and instruments which a forensic Lab must possess, particularly in FIA.

It is the duty of the Chemist to examine, assess and interpret the chemicals, bullets, explosives, bomb pieces, derbies, powders, liquids, liquors, poisons and toxic materials, stains, other warfare chemical agents and to analyse the physical forensic evidence from crime scene. The chemists do the case working as well as operational tasks in processing the forensic evidence. The chemist also is required to conduct regular research related tasks. The forensic Biologist and Biochemist examine and report fingerprint and DNA samples collected from the scene of offence. In Forensic

Toxicology following ingredients are determined:

- Determination of toxic materials and their effects and effects of alcohol or other drugs,
- Drug tolerance,
- Therapeutic index,
- Carbon monoxide or hydrogen sulphide poisoning and their effects on brain

Certain tasks are performed jointly by Chemist and Biologist.



**Figure 1: Forensic experiment in testing Lab**



**Figure 2: DNA Test in Peshawar Lab**

Nowadays some universities offer degrees in criminology with specialisation in Forensic Biology and Toxicology due to the importance of their disciplines. In Australia the Murdoch University is famous in the disciplines such as speciality related to handling areas of Crime

Science, White Collar and Corporate Crime. Malaysia also offers elite Forensic Science programs directed towards and focusing on forensic investigations.

The degrees in Biochemistry and Forensic Biology are offered as a normal routine.

#### **4. Squads of FBI to process Forensic Procedures**

Federal Bureau of Investigation (BFI) is equipped with strong departments to support the task of investigation. The strongest one are that Chemistry and Biology to cater the processing of Forensic procedures jointly. The Labs at FBI are equipped with most recent equipment to handle all types of Forensic tests and quarries. This is uniqueness with FBI to have all types of experimental Labs and qualified and skilful manpower. The Federal Investigation Agency (FIA) possesses strong legal setup but lacks in strength of the following squad of qualified and experienced man power as possessed by FBI:

**Table 1: Role of Experts in formulating evidence**

S#	Field	Task
1.	Biologist	To conduct & analyze DNA test of the samples and comparison of DNA Samples.
2.	Chemists	Scientific interpretation, assessment and chemical analysis of physical forensic evidence.
3.	Cryptanalysts	Handle the cryptic communications, records, or symbols and to break the codes, wherever necessary.
4.	Document Analyst	Operational investigations and post-crime forensic analysis regarding the identification and comparison of document
5.	Electronics Engineer	Examination of explosive and other devices having electronic devices; Procuring Computer based codes and information. In collaboration with Computer personnel.
6.	Forensic Operations Specialist	This job offers investigative, technical, operational, and logistical support such as conduct of complex and high-hazard forensic operations.
7.	Geologist-Forensic Examiner	Forensic metallurgy services. Metallurgists within the Laboratory Division conduct metallurgical analysis of materials and provide scientific support to FBI investigations.
8.	Management and Program Analyst	Program analysis and analytical functions using qualitative and quantitative methods to improve the efficiency and effectiveness of work methods.
9.	Metallurgist-Forensic Examiner	Conduct metallurgical analysis of materials and provide scientific support to FBI investigations, scientific assessments, interpretation, assisting in crime scene investigations and providing trial testimony.
10.	Visual Information Specialist	Provide graphic and physical modelling for investigator and prosecutor, Create technical diagrams, demonstrative exhibits and special equipment and apparatus, and forensic facial imaging.
11.	Photographer	Photographer Laboratory, Photographer Scientific and Technical and Photographer Forensic perform tasks

**Following are test sample of DNA report reproduced from [13]**

**Paternity Test Certificate**

By order of John Test we were requested to perform a paternity test. Following individuals were examined:

SAMPLE NR.	ROLE	NAME	DATE OF BIRTH
HID123830_001	Alleged Father	Jim Doe	11/11/1990
HID123830_002	Child	John Test	22/02/2012

Regarding the sampling of the participants please refer to the protocols in copy.

We received the originals of the identity confirmations and of the consent statements.

**Method:**

DNA isolation was carried out separately for all samples. Genetic characteristics were determined by the following PCR-single-locus-technology analysis.

Promega PowerPlex 21 (WEN ILS 500)

With the Promega PowerPlex 21 (WEN ILS 500) twenty one (21) independent PCR- systems were analysed: Amelogenin AM, D3S1358, D1S1656, D6S1043, D13S317, Penta E, D16S539, D18S51, D2S1338, CSF1PO, Penta D, TH01, vWA, D21S11, D7S820, D5S818, TPOX, D8S1179, D12S391, D19S433, FGA.

In parallel, positive and negative controls were performed which gave the expected and correct results.

Figure 3(i): DNA Test Sample Report  
(Courtesy: Vaterschaftstests-Briefvorlage-EF-V12\_150224)

<b>DNA-System</b>	<b>DNA-criteria Jim Doe HID123830_001</b>	<b>DNA-criteria John Test HID123830_002</b>
<b>AM</b>	<b>X, Y</b>	<b>X, Y</b>
<b>D3S1358</b>	<b>14,14</b>	<b>14,18</b>
<b>D1S1656</b>	<b>16.3,17.3</b>	<b>16.3,17.3</b>
<b>D6S1043</b>	<b>11,17</b>	<b>17,17</b>
<b>D13S317</b>	<b>9, 12</b>	<b>9,9</b>
<b>Penta E</b>	<b>10,16</b>	<b>10,16</b>
<b>D16S539</b>	<b>12,12</b>	<b>12,13</b>
<b>D18S51</b>	<b>12,13</b>	<b>13,14</b>
<b>D2S1338</b>	<b>23,23</b>	<b>23,24</b>
<b>CSF1PO</b>	<b>10,11</b>	<b>9, 10</b>
<b>Penta D</b>	<b>9, 10</b>	<b>8,9</b>
<b>TH01</b>	<b>6,6</b>	<b>6,7</b>
<b>vWA</b>	<b>15,17</b>	<b>15,18</b>
<b>D21S11</b>	<b>29,30</b>	<b>29,30</b>
<b>D7S820</b>	<b>8, 11</b>	<b>9, 11</b>
<b>D5S818</b>	<b>11,13</b>	<b>11,12</b>
<b>TPOX</b>	<b>9, 11</b>	<b>9, 11</b>
<b>D8S1179</b>	<b>13,14</b>	<b>13,14</b>
<b>D12S391</b>	<b>18,18</b>	<b>18,19</b>
<b>D19S433</b>	<b>13,14</b>	<b>14,15</b>
<b>FGA</b>	<b>18,25</b>	<b>18,19</b>

Figure 3(ii) Results

Courtesy: Vaterschaftstests-Briefvorlage-EF-V12\_150224

## Conclusion

It has been emphasised by the authors of this paper in [14] that there must be a connected association between the members of the investigating team and the prosecutor. The collection of evidence, its procurement from the scene of offence, Lab Testing and organisation of information so prepared; all such activities require experts in the concerned areas. The coordination between the Forensic Experts and legal experts is also very much required. Therefore it is strongly recommended that the Federal Investigation Agency (FIA) must take measure to update their own Laboratories and hire competent experts as shown in Table 1 similar to the setup prevalent in FBI.

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