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Terrorism Trials: Using Forensic Evidence

module 3

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Module Descriptor

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Module Purpose and Overview

The use of scientific evidence in criminal prosecution has increased significantly. Forensic science reports are routinely used in the criminal justice system. The aim of this module is to introduce the Prosecutors to the modern methods used for analysis of evidence as well as the basic safeguards that have to be observed to ensure their admissibility in Court. The module has been developed to provide a comprehensive overview of the paradigm of forensic science primarily in the context of judicial proceedings. The module extensively covers the theoretical underpinnings of the use of forensic evidence and contextualizes such evidence within the domestic legal system of Pakistan. Moreover, the legal framework pertaining to the use of forensics in judicial proceedings will also be explained to develop a critical understanding of the challenges that are faced in this regard

Module Outline

This module is divided into separate chapters, each of which deals with a unique area within the realm of forensic evidence. Chapter 1 is an introduction to the general principles of forensic evidence. Essentially, chapter 1 addresses the definitional aspects of forensic evidence and its general principles. Chapter 2 demarcates the relevance of forensic evidence in the context of criminal proceedings. Chapter 3 extensively outlines and expands upon the spectrum of forensic evidence by reference to the services offered by the Punjab Forensic Agency. Thereafter, chapter 4 delineates the legal framework that governs forensic evidence in Pakistan and explores the intricacies of relevant legal provisions. Chapter 5 draws upon domestic case law to illustrate procedural challenges that have manifested themselves when reliance was to be placed on forensic evidence. Furthermore, chapter 6 summarily propounds the law on the admission of forensic evidence in international jurisdictions. Lastly, chapter 7 highlights certain recommendations that may assist in giving forensic evidence a more central position in the judicial system.

The module relies upon extensive case studies of actual terrorism cases to illustrate specific sections. The module also comprises of self-assessment questions and independent research activities to allow you to simultaneously test and expand your knowledge of the subject.

How to use this Module?

The chapters in this module have been drafted in a sequential manner. However, each chapter is also self-contained for ease of reference and revision purposes. The beginning of each chapter contains learning outcomes and the essential and/or recommended reading should be done keeping these learning outcomes in mind. Each section further contains activities and case studies. These are meant to reinforce the learning outcomes set out for each chapter and should be attempted after each section is completed. At the end of each chapter there is a reflect and review questionnaire which should be filled out by the participants of the training, and the training methodology should be tailored according to the feedback received.

Learning Outcomes

By the end of this Module students will be able to:

- Define forensic evidence.
- Explain the functionality of forensic science.
- Identify the principles of forensic science.
- Identify the importance of forensic evidence in counter-terrorism cases.
- Relate the relevance of disseminating sensitive information to general practitioners.
- Classify the different types of forensic evidences.
- Define and explain the analysis of forensic evidences.
- Identify the precautions to be taken when handling forensic evidence.
- Explain the legal framework that governs the admissibility of forensic evidence in criminal and counter-terrorism cases.
- Explain the importance of admitting forensic evidence in counter-terrorism cases.
- Define an expert.
- Explain why forensic evidence is considered as weak evidence.
- Identify the various procedural challenges a prosecutor may face in judicial proceedings.

Chapter 1

Introduction to Forensic Evidence

Contents

Introduction

A study of the use of forensic evidence in criminal trials would be grossly incomplete without an analysis of the fundamental underpinnings of forensics. Naturally, this involves a definition of forensic science but also a brief study of the historical development of the use of forensic evidence. Primarily, however, this section deals with the theoretical interplay between forensic evidence and crimes, and the normative principles that govern forensic science.

Learning Outcomes

By the end of this Chapter and the relevant readings you should be able to:

- Define forensic evidence
- Explain the functionality of forensic science
- Identify the principles of forensic science

Essential Reading

- Indian Evidence Act, 1872
- Punjab Forensic Science Agency Act, 2002
- Qanun-e-Shahadat Order, 1984
- Interpreting Evidence: Evaluating Forensic Science in the Courtroom by Bernard Robertson, G.A. Vignaux and Charles E.H. Berger
- Expert Witnesses: In Defence of Expert Witnesses in General and of Document Examiners in Particular by R.A. Huber

Recommended Reading

- DNA Technology in Administration of Justice by Jyotirmoy Adhikary
- Individualization Claims in Forensic Science: Still Unwarranted by Jonathan Koehler and Michael Saks
- Crime Scene and Physical Evidence Awareness for Non-Forensic Personnel by UNODC

1.1 Definition of Forensic Evidence

Forensics is defined as 'used in or suitable to Courts of law or public debate'. Forensic evidence is defined as 'evidence used in Court; esp., evidence arrived at by scientific or technical means; such as ballistic or medical evidence.' As per the Locard Principle which is mentioned in detail subsequently, the basis for forensic evidence is that 'every contact leaves a trace'.

Under domestic law, the only definition available for forensics is found in the Punjab Forensic Science Agency Act 2007. Under the said Act, forensic material is defined as a 'document, material, equipment, impression or any other object connected with the commission of an offence, a civil cause or any other proceedings'.[1]

Forensic science deals predominantly with the recovery and analysis of latent evidence which includes fingerprints, DNA analysis, autopsies, pathologies etc. There is a whole range of techniques used for forensic purposes and it is important to understand how such evidence is to be interpreted and incorporated into the judicial process relating to counter-terrorism in KP.

The concept of forensic science can be dated to the 1800s. In 1858, William Herschel, administrator in the Hooghly District of Bengal, India began recording handprints of natives. Herschel's successor in India then developed a workable fingerprint classification system which was adopted by the Scotland Yard in 1901 and with local modifications is still being used around the world. The earliest legal codification of rudimentary forensics was in 1899 when the Indian Evidence Act, 1872[2] was amended and Section 45 was introduced which introduced the admissibility of handwriting and fingerprints experts as well as persons specially skilled in science.[3]

Internationally, the benefit of using forensic sciences and its utility in convicting perpetrators of crime has made it a mainstay in the functioning of the criminal justice system.

[1] Punjab Forensic Science Agency Act 2007, Section 2(g).

[2] Refer to Qanun-e-Shahadat Order 1984, Article 59.

[3] Indian Evidence Act 1872, Section 45: When the Court has to form an opinion upon a point of foreign law, or of science or art, or as to the identity of hand writing or finger impressions, the opinions upon that point of persons specially skilled in such foreign law, science or art, hand writing or finger impressions are relevant facts. Such persons are called experts.

Self-Asssessment Questions

- In your own words, give a comprehensive definition of 'Forensic Evidence'.

1.2 Functionality of Forensic Science

The functionality of forensic science in criminal investigations and especially counter-terrorism cases can be understood by referring to three questions. Firstly, whether a crime has been committed. This is because forensic science can be used to ascertain the existence of *corpus delicti*.[4] Secondly, how and when the crime was committed. This is established by examining the *corpus delicti* which reveals the way the crime was committed and the possibility of the time that it was committed. Thirdly, who committed the crime. Forensic science establishes the identity of the culprit through different mechanisms such as fingerprint analysis or DNA analysis. It therefore, connects the criminal to the crime through traces left at the crime scene or taken from the crime scene.[5] Due to the three-fold function of forensic science, it holds a seminal position in the criminal justice system.

Self-Asssessment Questions

- What are the three questions that a prosecutor needs to consider when reviewing forensic evidence in a case?

1.3 Principles of Forensic Science

There are certain fundamental principles relating to forensic science. These are:

(i) **Locard's Principle**

This principle is based on the idea that a perpetrator will leave marks or traces on the crime scene or carry traces from the crime scene.[6] It operates on a principle of exchange that every contact leaves a trace. For example, in counter terrorism cases, carpet fibers from the place of attack may be found on

[4]The facts and circumstances constituting a crime for example a corpse

[5]Jyotirmoy Adhikary, *DNA Technology in Administration of Justice* (LexisNexis Butterworths 2007), 14.

[6]Bernard Robertson, Charles E. H Berger and G. A Vignaux, *Interpreting Evidence: Evaluating Forensic Science in the Courtroom* (2nd edn., Wiley 2016), 2.

the perpetrator's shoes which could connect the suspect to the crime. While, Locard himself did not mention anything related to an exchange, the modern principle that evolved from his theory, is oft-referred to as the 'exchange principle'.

(ii) **Principle of Individuality**

This principle is based on the notion that two objects may be indistinguishable but not identical. In other words, objects, whether natural or man-made, will contain some individual marks no matter how small. These can then be identified and exploited for the purposes of forensic science.

(iii) **Individualization Principle**

'When any two items have characteristics in common of such number and significance as to preclude their simultaneous occurrence by chance, and there are no inexplicable differences, then it may be concluded that they are the same, or from the same source.'[7] According to the principle of individualization, if enough similarities are seen between two objects to exclude the possibility of coincidence, then the objects are said to come from the same source.[8] The principle rules out all possible sources of an unknown marking when a single object or person is found that matches the features of the unknown marking.[9]

Self-Asssessment Questions

- What are three primary principles that govern forensic science?

Activity (1.3)

Read, Chapter 1 'Introduction' of Interpreting Evidence: Evaluating Forensic Science in the Courtroom by Bernard Robertson, G.A. Vignaux Emeritus and Charles E.H. Berger.

- Describe the three principles of forensic science in detail.
- Are there any theoretical difficulties with the principles that you have identified?

[7] Roy A. Huber, 'Expert Witnesses - In Defence Of Expert Witnesses in General and of Document Examiners in Particular' (1959) 2 The Criminal Law Quarterly.

[8] *ibid.*

[9] Jonathan Koehler and Michael J. Saks, 'Individualization Claims in Forensic Science: Still Unwarranted' (2010) 75 Brooklyn Law Review, 2.

1.4 Relevance

The most important aspect of forensic evidence tendered in Court is its relevance to the case and its admissibility. The relevance of evidence refers to the degree of connection and probative value between a fact that is given in evidence and the issue to be proved. Forensic evidence in Pakistan is considered relevant under Article 59, QES. Its admissibility has been subject to vast jurisprudential debate and where other formalities are met, it is to be considered conclusive evidence under the Anti-Terrorism Act, 1997.

1.5 Chain of Custody

Another very important aspect of forensic science is the maintenance of a proper 'chain of custody' when dealing with evidence. Chain of custody refers to the 'chronological and careful documentation of evidence'[10] to establish its connection to a crime. All evidence has to be carefully and properly documented bearing in mind its peculiarities. Maintaining a chain of custody requires the production and maintenance of written documentation with a clear-cut timeline. Any transfer or transportation of evidence also has to be documented. This is to ensure that the evidence has not been contaminated or compromised with.[11] A break in the chain can be lethal to a prosecutor's case as is illustrated in the sections below.

Activity (1.4)

Read, 'The Storage of Forensic Evidence at the Forensic Science Laboratory in Pretoria, South Africa' by Juanita Van Der Walt and Rose Luke, which has been provided at the beginning of this Training.

- Write down the measures taken in South Africa to preserve the chain of custody of DNA evidence.

Summary

Forensic evidence is generally understood to encapsulate evidence arrived at by scientific or technical means. The domestic definition of forensic evidence

[10] *Crime Scene and Physical Evidence Awareness for Non-Forensic Personnel* (United Nations Office on Drugs and Crime 2009), 4. https://www.unodc.org/documents/scientific/Crime_scene_awareness__Ebook.pdf

[11] Joseph A. Prahlow, *Forensic Pathology for Police, Death Investigators, Attorneys, and Forensic Scientists* (1st edn., Humana Press 2010), 18.

is found in the Punjab Forensic Science Agency Act 2007 and reads as a 'document, material, equipment, impression or any other object connected with the commission of an offence, a civil cause or any other proceedings.

The functionality of forensic evidence in criminal investigations is understood by reference to three questions:

- Whether a crime has been committed?
- How and when was the crime committed?
- Who committed the crime?

Furthermore, there are three widely understood fundamental principles that govern forensic science. These are:

- Locard's Principle: This principle operates on the basis of the doctrine of exchange. Every contact will leave a trace.
- Principle of Individuality: Two objects may be indistinguishable from one another, but they cannot be identical
- Individualization Principle: If enough similarities are seen between two objects so as to exclude the possibility of coincidence, then the objects are said to come from the same source.

It must be noted that the most important aspect pertaining to forensic evidence is its degree of connection to the crime committed and the probative value it holds in Court. Forensic Evidence aids in establishing a 'chain of custody' i.e. the chronological documentation of evidence to the crime.

Reflect and Review

Look through the points listed below: Are you ready to move on to the next chapter?

Ready to move on: I am satisfied that I have sufficient understanding of the principles outlined in this chapter to enable me to go on to the next chapter.

Need to revise first: There are one or two areas I am unure about and need to revise before I go on to the next chapter.

Need to study again: I found many or all of the principles outlined in this chapter very difficult and need to go over them again before I move on.

Tick a box for each topic

I can, in detail, define forensic evidence.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can describe the origins of forensic evidence and explain the legal codification of forensic evidence in India.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can outline the importance of applying forensic evidence.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can explain in detail the three primary principles of forensic science

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can briefly outline the applicability of forensic evidence in Pakistan

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

If you ticked **'need to revise first'**, which sections of the chapter are you going to revise?

1.1. Definition of Forensic Evidence

☐ Must Revise ☐ Revision Done

1.2. Functionality of Forensic Science

☐ Must Revise ☐ Revision Done

1.3. Principles of Forensic Science

☐ Must Revise ☐ Revision Done

1.4. Relevance

☐ Must Revise ☐ Revision Done

1.5. Chain of Custody

☐ Must Revise ☐ Revision Done

Chapter 2

Relevance of Forensic Evidence in Criminal Proceedings

Contents

Introduction

It is imperative to understand the practical interplay between forensic evidence and criminal trials. Therefore, this chapter contextualizes the use of forensic evidence in light of criminal trials, and specifically, domestic terrorism proceedings under the Anti-Terrorism Act 1997. In the latter part of this section, we examine how forensics were used in the 2002 bombings in Bali, Indonesia. An analysis of such a case study serves as an illustrative example of the use of forensic evidence in cases of terrorism.

Learning Outcomes

By the end of this Chapter and the relevant readings you should be able to:

- Identify the importance of forensic evidence in counter-terrorism cases
- Relate the relevance of disseminating sensitive information to general practioners

Essential Reading

- Anti-Terrorism Act 1997
- A Ten-Year Retrospective of the Bombing Campaign in Indonesia by Terrorists, 2002–2006
- The Role of Crime Scene Investigators in Anti-Terrorism Investigations, 12 May, 2007 by Dr. Despina Moissidou

Essential Reading

- Anti-Terrorism Act 1997
- A Ten-Year Retrospective of the Bombing Campaign in Indonesia by Terrorists, 2002–2006
- The Role of Crime Scene Investigators in Anti-Terrorism Investigations, 12 May, 2007 by Dr. Despina Moissidou

2.1 Relevance of Forensic Evidence in Criminal Proceedings

With the rise of modern terrorism, the criminal justice system has had to adapt to act in a manner to use all operational mechanisms to prevent acts of terrorism and prosecute the perpetrators. Successful prosecution of terrorists' hinges predominantly on the evidence available. The collection, analysis and presentation of evidence is essential in ensuring a conviction. Therefore, there is a need for strong engagement between the police, forensic science experts/labs and the prosecutors for converting material collected at the crime scene or during investigations is made admissible in court to ensure safe convictions of the perpetrators of terrorist acts.

The Anti-Terrorism Act of 1997 (ATA) aims to enhance the investigatory powers of law enforcement personnel. This includes powers to arrest and conduct searches without warrants. Certain provisions of the Cr.P.C. are relaxed by the ATA. These powers should enhance the abilities of investigators and facilitate evidence collection in terrorism cases. Unfortunately, this is not always translated into convictions at trial. There is, therefore, a need to develop mechanisms by which investigators, forensic experts/labs, and prosecutors are able to work together to achieve safe convictions. Without such a focus from all concerned stakeholders in the criminal justice system it will not be possible to improve the conviction rates in courts in ATC cases.

In order to ensure convictions, the case of the prosecution has to be proven beyond all reasonable doubt. Forensic science can be of immense value in not just securing convictions but also establishing key elements of the crime, exonerating the innocent and assisting in establishing the sequence of events of the terrorist activity. Therefore, the duty of law enforcement agents and other first responders at a crime scene to preserve the integrity of a crime scene is crucial to the case of the prosecution.

In a classic terrorism case of a bomb explosion, forensics can play a significant role in the post-blast investigation. This can be done through reconstruction of the incident, establishment of the site of the explosion, collection of clues and the search of live explosive material. Forensic photography can identify the type of bomb used and the bomb 'signature'. The bomb signature can be identified by what kind of explosive was used, how much of it was used, how it was detonated and the number of people that were killed and injured. The collection of bullets and in the case of improvised explosive devices (IEDs), the recovery of bomb components, detonators and initiators can also help

provide the bomb signature.[12] Moreover, bomb-blasts leave behind smoke residue which can leave traces on fingernails, clothes, hands etc. This can help connect perpetrators to the terrorist activity.

Activity (2.1)

After reviewing the ATA outline what powers are given to law enforcement bodies to enhance their abilities to conduct investigations?

- How does forensic evidence help in achieving convictions in counter-terrorism cases?

2.2 Case Study: The 2002 Bombings in Bali, Indonesia - Paddy's Bar and Renon

Indonesia has been the victim of a number of terrorist incidents that claimed the lives of hundreds and sparked international outrage.[13] In 2002, three bomb explosions occurred on the Indonesian island of Bali which resulted in the death of approximately 202 people.

This case study will isolate two of these bomb explosions: the explosion on the ground floor of 'Paddy's Bar nightclub' and a smaller bomb explosion in the embassy suburb of Renon.

Renon

Initial reports suggested that the incident at Renon was attributable to unrelated fireworks. However, experts noted that the evidence pointed to the contrary. A characteristic of high explosives is that they detonate which manifests itself with a shockwave. This has a shattering effect. The presence of a shallow sandy crater at Renon was testament to the detonation of high explosives.

The site at Renon had relatively little damage as opposed to the carnage at the Sari Club site. The Indonesian National Forensic Team (LABFOR) focused on the latter. However, sites that have the greatest potential to yield

[12]Rita S Guenther, Micah Lowenthal and Lalitha Sundaresan, *India-United States Cooperation on Science and Technology for Countering Terrorism: Summary of a Workshop* (National Academy Press 2014), 120.

[13]David Royds OAM, 'A Ten Year Retrospective of the Bombing Campaign in Indonesia by Terrorists, 2002–2006' (2012) 45 Australian Journal of Forensic Sciences, 123-146.

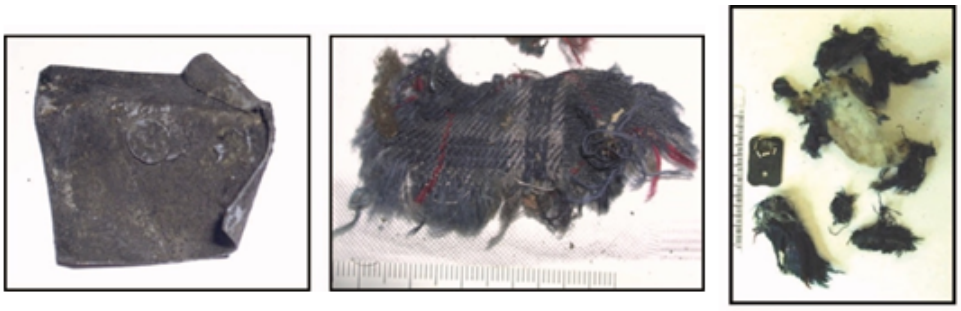
evidence are those where minimal damage has occurred. The Renon site had no fatalities and the damage was minimal but yielded significant evidence.

Paddy's Bar

As opposed to the Renon site, there was a notable absence of a crater at Paddy's Bar. Yet an exploration of the spatter from the ceiling indicated the center of the blast was approximately 100 centimeters from the floor. However, the absence of any shattered timber indicated that furniture was not used to prop up the bomb.

Furthermore, it was discovered that the biological splatter on the ceiling had all come from one individual, indicating intimate proximity to the bomb. This lead to the plausible conclusion that the incident must have been a suicide bombing. Small fragments of tartan fabric – commonly used to line suicide vests – were recovered.

Small metal fragments were also discovered both at the site and embedded in victims. This lead to the conclusion that they had been used as shrapnel – a commonly employed method utilized in suicide bombings to ensure maximum



injury and damage.

Further crucial forensic findings that played a decisive role in the Bali Bombings case were:

i. The discovery of impressed numbers in chassis fragments that survived the blast that enabled the vehicle used in one of the bombing to be traced back to a member of the terrorist gang whose confession was subsequently used to identify the other accused.

ii. Forensic chemistry expertise was used to analyse both organic and water-soluble residues from the bombings to identify the main ingredients and type of explosives used in both devices. This information was used, along with other evidence, to provide additional links to the accused.

The following chapter explores the types of forensic analyses that are carried out in Pakistan at the Punjab Forensic Science Agency.

Reflect and Review

Look through the points listed below: Are you ready to move on to the next chapter?

Ready to move on: I am satisfied that I have sufficient understanding of the principles outlined in this chapter to enable me to go on to the next chapter.

Need to revise first: There are one or two areas I am unure about and need to revise before I go on to the next chapter.

Need to study again: I found many or all of the principles outlined in this chapter very difficult and need to go over them again before I move on.

Tick a box for each topic

I can identify the problem resulting in acquittals in counter terrorism cases.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can explain the importance of forensic evidence in terrorism judicial proceedings.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can describe the importance of disseminating forensic evidence and other relevant information to practitioners.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

If you ticked **'need to revise first'**, which sections of the chapter are you going to revise?

2.1. Relevance of Forensic Evidence in Criminal Proceedings

☐ Must Revise ☐ Revision Done

2.2. Case Study: The 2002 Bombings in Bali, Indonesia – Paddy's Bar and Renon

☐ Must Revise ☐ Revision Done

Chapter 3

Types of Forensic Analysis

Contents

Introduction

This chapter extensively covers the variety of forensic analyses that can be performed on any given category of evidence. Multiple case studies have been cited in this chapter to elucidate how specific forms of forensic analyses are crucial in ensuring convictions in terrorist trials.

Learning Outcomes

By the end of this Chapter and the relevant readings you should be able to:

- Classify the different types of forensic evidences
- Define and explain the analysis of forensic evidences
- Identify the precautions to be taken when handling forensic evidence

Essential Reading

- DNA Evidence in Pakistani Courts: An Analysis by Shahbaz Ahmad Cheema
- Quetta Inquiry Commission Report, 13th December, 2016 by Justice Qazi Faez Isa
- Admissibility of Fingerprint Evidence and Constitutional Objections to Fingerprinting Raised in Criminal and Civil Cases by Andre A. Moenssens
- Benbrika & Ors vs. The Queen, VSCA 281; 29 VR 593; 204 A Crim R 457; 247 FLR 1
- Salman Akram Raja vs. The Government of Punjab, 2013 SCMR 2013

Recommended Reading

- The Constitution of Pakistan, 1973
- Criminal Law (Amendment) (Offences Relating to Rape) Act 2016
- The Constitution of the Islamic Republic of Pakistan, 1973 by Nafeer Ahmed Malik, Sardar Khalil Tahir Sandhu and Chauhdry Asghar Ali Kamboh

- An Analysis of Forensic Evidence used in the Prosecution of Terrorism Cases in Britain between 1972 and 2008 by Dagmar P. Heinrich
- Forensic Evidence Management: From the Crime Scene to the Courtroom by Ashraf Mozayani and Casie Parish-Fisher
- Chapter 8: 'Crime Scene Management' of Introduction to Criminal Investigation: Processes, Practices and Thinking by Rod Gehl
- Pakistan's Action to Counter-Terrorism – Expert Working Group Meetings on 'Managing the Scenes of Terrorist-Incidents by UNODC
- A Simplified Guide to DNA Evidence, National Forensic Science Technology Centre.

Self-Assessment Questions

- List the different types of forensic evidence.

In a study, 'Forensic Evidence used in the Prosecution of Terrorism Cases in Britain (1972-2008)'[14] forensic evidence was broadly divided into eight categories. These are indicative of how forensic evidence in terrorism cases may be demarcated by reference to their nature. They are:

- Medical forensic evidence (human body and toxicology)
- Human biological trace evidence (hair, DNA, saliva, blood, semen)
- Forensic chemical evidence (drugs, chemicals and explosives
- Micro traces (fire, glass, paint, non-human biological traces, fibers, textiles)
- Ballistics (guns, ammunition and gunshot residue)
- Digital and document evidence
- Biometric evidence (fingerprints, ear prints, etc.)
- Real evidence (objects)

In terms of likelihood of finding in terrorism cases, digital and document evidence is likely to be available, followed by real and chemical evidence.

[14]Dagmar P. Heinrich, Amy E. Thornton, Ruth M. Morgan, and Noemie Bouhana, 'An Analysis of Forensic Evidence used in the Prosecution of Terrorism Cases in Britain between 1972 and 2008' (2012), Oxford University Press.

Medical forensic evidence, human biological trace evidence and micro traces tend to be rare finds.

The following are various types of forensic services that are carried in light of the evidence gathered from a crime scene.

3.1 Audio Visual Analysis

Audio and visual recordings are of immense use in criminal cases. Internationally this mode of forensic detailing has been used to assist in investigations using an array of tools and techniques.

Sources of recorded audio and video that can assist in investigations has increased tremendously in the past few years. Closed Circuit Television Systems (CCTV) and video and audio recorders are now found more abundantly and have been used in Courts to connect the accused to the crime scene. In cases where high quality audio and video recordings are not available, forensic experts use techniques to enhance recordings making them clearer and more audible.

Prosecutors should ensure that they provide sufficient oversight in the process of collecting, preserving and transporting evidence. This is to ensure that evidence collected is admissible in Court and the successes of law enforcement agents are not lost in Courts due to procedural ineptitude.

Audio Visual analysis is carried out in the Punjab Forensic Science Agency in Lahore. The Department provides the following services:

- clarification of audio evidence
- clarification of video evidence for identification and association of different events captured by video surveillance systems
- analysis of images extracted from video evidence using forensic enhancement and clarification tools
- The Punjab Forensic Science Agency has listed down the following measures that have to be taken to ensure that the evidence remains forensically viable.

3.1.1 Packaging Instructions

- Items should be individually packaged in containers of suitable size
- Evidence collected should be properly documented, labeled, marked, photographed and inventoried
- Digital evidence should be packaged in anti-static packaging; paper bags, envelopes, cardboard boxes and anti-static containers
- Packaging environment should be of mild temperature and humidity

- Packaging should be shock resistant
- Video evidence should be collected in its original format as it has been recorded
- Power supplies for the electronic devices should also be seized
- All evidence must be sealed; removal of the seal must cause some visible damage to the contained to indicate that it has been tampered with
- The seal must be signed and dated

3.1.2 Transportation Oversight

Prosecutors should ensure that the transportation of the evidence is documented to maintain the chain of custody. Establishing a chain of custody is essential to cases where forensic evidence is relied on. As will be discussed subsequently, forensic evidence is not direct evidence and is subject to judicial scrutiny. Therefore, to ensure its admissibility in Court, prosecutors should be mindful that the above-mentioned steps are taken.

Self-Assessment Questions

- List three audio and visual forensic evidence.
- What precautions must be taken when handling such forensic evidence?

3.2 Forensic Photography

Forensic photography is a visual documentation of the scene and evidence within the scene. Photographs taken at the crime scene allow investigators to recreate the scene and to present it in Court. Forensic photography aids the judicial process by confirming the content of an image and the conclusions contained within the reports.

Self-Assessment Questions

- How does forensic photography aid the judicial process?
- Watch 'Crime Scene Investigation & Photography 2015' by County College of Morri.

`https://www.youtube.com/watch?v=3bXFuccJqko`

3.3 Computer Forensics

Computer forensics pertains to the practice of collecting, analyzing and reporting on digitally stored media and computer systems. Computer forensic analysis can be crucial to an anti-terrorism case as it not only holds evidence in the form of emails, internet history, documents and files relevant to the crime but also reveals when a document first appeared on a computer or was last edited and saved. Maintaining a chain of custody in cases of computer forensics is essential in ensuring its admissibility in Court.

The Computer Forensics Unit at the Punjab Forensic Science Agency carries out the following types of examinations and analyses:

- Scientific examination and analysis of digital storage media (Hard Drives, Flash Memory, CD/DVD etc.)
- Forensic Analysis of Mobile Phones and Personal Digital Assistants (PDA devices)
- Retrieve/acquire evidence from digital media
- Recovery of deleted digital data in case of hardware or software damage

3.3.1 Packaging Instructions

Prosecutors should be mindful of the packaging instructions mentioned above in Sec 3.2.1. This requires a stronger relationship between the prosecution department and the police. In addition to the instructions mentioned above the following steps should also be taken:

- The collected digital device(s) should be stored in a secure environment or location that is not subject to extreme temperature or humidity. It should not be exposed to magnetic fields, dust, vibration, moisture or any other environmental elements that may damage it.
- Leave Mobile Devices/ Smart Phones in the power state (On or Off) in which they are found. Mobile Devices/ smart phones should be isolated from the Network using Network Isolation Techniques i.e. Faraday Isolation bags, Radio Frequency shielding material, anti-static packing and aluminum foils.

3.3.2 Transportation Oversight

As with other forms of evidence, the prosecution has to maintain and prove a chain of custody in Court in order for the evidence to be admissible.

Activity (3.3)

Read the following case study pertaining to Al-Qaeda Inspired Terrorist Units and identify the types of evidences which are commonly collected in Al-Qaeda Inspired terrorist attacks.

In recent times, Al-Qaeda Inspired (AQI) terrorist groups have drastically risen in prominence and replaced the IRA in terms of the highest national security threat in the UK.[15] Inspired by Usama Bin Laden, its aims are the expulsion of Western forces from Saudi Arabia, the destruction of Israel and the end of western influence in the Muslim world.

The utilization of suicide bombing and targeting civilians to ensure mass casualties became a marker of AQI terrorism.

The type of evidence predominantly present in AQI terrorism cases is considerably unique to their modus operandi. Statistically speaking, digital and document evidence far outweigh any other type of evidence. The prevalence of digital evidence is attributable to two factors. First, the modern technological time period in which AQI suspects operate naturally renders them susceptible to digital documentation. Second, the fact that investigations regarding AQI activities are fundamentally pre-emptive means that there is a natural reliance on digital surveillance.

Forensic chemical evidence is prominent because of their utilization of explosive devices and incendiaries. However, it must be noted that AQI terrorists mainly rely on peroxide-based home-made explosive substances which have to be mixed together, which directly correlates to the higher amount of chemical substances found in their cases. Therefore, evidence of the characteristics of bomb making and instruction material can be used to identify AQI terrorism.

Ballistic and real evidence is very rare since AQI terrorists notoriously employ the tactic known as suicide bombings. Consequently, both real and ballistic evidence are an unlikely find.

[15] *Prevent Strategy* (The Stationery Office 2011).

3.4 Crime Scene & Death Scene Investigation

Crime Scene Investigation is widely carried out around the world in criminal cases and cases of terrorism. The recording of crime scenes is very crucial to a case and is accomplished by using photographs, videos, sketches etc. In cases of terrorist bombings, the physical appearance and characteristics of the scene change drastically. Experienced bomb scene investigators can determine what occurred at the crime scene by first locating where the device was detonated using that as the focal point of investigation.

The Punjab Forensic Science Agency has the capacity to process the crime scene through photography, sketching, documentation and audio and video recording. It also provides collection services which include physical evidence, biological evidence, trace evidence, impression evidence, packaging and sealing of evidence and maintaining chain of custody forms. Death Scene Investigation is also carried out at the facility which aids in determining in the case, manner and mechanism of death as well as estimating a time of death.

Investigation operations at the crime scene have to be carefully planned in line with human rights, safety concerns and the preservation of evidence for prosecutorial purposes.

Modern forensic techniques can analyze blood splatters, create a replica of the crime scene to test hypotheses and determine the number of people involved in the crime and the sequence of events. In cases where vehicles are involved, the serial number of the car can be restored and a crash determination analysis can also be carried out at the facility.

It is important for prosecutors to be aware of these techniques to be able to advise the police regarding the type of forensic evidence to be used.

3.4.1 Crime Scene Management

Crime Scene Management refers to the practices adopted by forensic science entities '... to maintain the chain of custody and evidence integrity throughout the course of evidence collection, storage, preservation and processing.'[16] It focuses on the identification of evidence, its collection, protection and documentation. Crime scene management is a critical part of a terrorism case as without the proper implementation management standards, the case has a higher potential to fail during judicial proceedings.

[16] Ashraf Mozayani and Casie Parish-Fisher, *Forensic Evidence Management: From The Crime Scene To The Courtroom* (CRC Press 2017).

It is imperative to note that crime scene management is a technical subject, that primarily relates to investigation agencies and forensic experts. Therefore, crime scene management and its detailed connotations fall outside the scope of this Module.

To explore the intricacies of crime scene management in detail, refer to Activity 3.3. and associated Recommended Readings.

Activity (3.4)

- Watch' Introduction to Crime Scenes' by University of Derby

  `https://www.youtube.com/watch?v=JgzdhUAJrBA&t=1s`

- Watch 'Evidence Collection & Preservation: Searching Techniques' by University of Oklahoma Forensic Science Institute

  `https://www.youtube.com/watch?v=zPTnBufPv08`

- Watch 'Evidence Collection & Preservation: Crime Scene Management Overview' by University of Central Oklahoma Forensic Science Institute

  `https://www.youtube.com/watch?v=sFtM9s0UrIA`

- Go over the 'Boston Marathon Bombing Trial Evidence'[17] and list down the forensic evidence collected by the Investigating Agency.

- Explain how the accumulated evidence aided in convicting the perpetrator.

3.5 DNA & Serology

DNA testing can be crucial to a case. The genetic patterns found in blood, semen and saliva are distinctive and can provide conclusive evidence as, with the exception of cases of identical twins, the DNA found in each person can make it possible, with a great degree of accuracy to associate a suspect with a crime. To this extent, DNA evidence has revolutionized forensic science because of its degree of precision. In many developed countries, DNA databases exist which increase the possibility of the arrest of profiled offenders. The creation of such a database can be very helpful in the prosecution

[17]'Boston Marathon Bombing Trial Evidence' (*Cbsnews.com*) <https://www.cbsnews.com/pictures/boston-marathon-bombings-trial-evidence/> accessed 25 January 2018.

of terrorists in Pakistan. However, there are certain legal and practical considerations that may arise in the creation of such a database such as the personal rights of offenders as well as the cost of maintaining such a large database. Furthermore, the creation of a DNA database would require a comprehensive legal framework to ensure that it is not misused and that the rights of the people who are sampled are not infringed in any manner.[18]

There is a growing body of jurisprudence on the admissibility and relevance of DNA evidence in Pakistan. While the legal framework pertaining to DNA marginalizes its value as potential primary evidence (as will be discussed subsequently in Section 4), the Courts have in cases given primary credence to DNA results.

The Supreme Court of Pakistan weighed in on the legal issues pertaining to DNA evidence in the case of *Salman Akram Raja vs. The Government of Punjab*.[19] The Supreme Court ruled that DNA tests should be conducted in all sexual offences and that DNA samples should be preserved as well. However, at the same time the Court cautioned that DNA evidence is not infallible. In 2016, amendments were made to the Cr.P.C. by virtue of the Criminal Law (Amendment) (Offences Relating to Rape) Act 2016 which included section 53A relating to 'Examination of person accused of rape, etc. by medical practitioner'. Section 53A gives express authorization to compel a person to give DNA samples who is arrested on a charge of committing an offence of rape, unnatural offence or sexual abuse or an attempt to commit these offences. This however does not extend to terrorism cases and the current legal framework does not make it mandatory to collect DNA samples of terrorists. However, while there is no mandatory provision regarding DNA, the Anti-Terrorism Act 1997 in Section 27B clearly states that, 'a person accused of an offence under this Act may be convicted on the basis of electronic or forensic evidence or such other evidence that may have become available because of modern devices or techniques'

Due to the fact that DNA testing is not widely used in cases of terrorism there have been cases where the evidentiary value of DNA results has been undermined. In the murder trial of Benazir Bhutto, DNA evidence was obtained from the FBI's DNA laboratory in Quantico, Virginia. The findings of the report were initially included in the challan submitted to the Court. However, these were later excluded as they lost evidentiary value. The evidentiary value was lost on two accounts. Firstly, because representatives from the FBI

[18]Shahbaz Ahmad Cheema, 'DNA Evidence in Pakistani Courts: An Analysis' (2015) 3 LUMS Law Journal, 2-3.

[19]*Salman Akram Raja vs. The Government of Punjab,* 2013 SCMR 2013

did not appear in Court to testify and secondly because the investigators could not establish a chain of custody of the evidence. Therefore, prosecutors in terrorism cases need to ensure that DNA evidence is properly submitted in Court with an identifiable chain of custody to ensure its admissibility.

Activity (3.5)

- Why is a DNA test inadmissible in certain cases in the Courts of Pakistan?
- Read 'A Simplified Guide to DNA Evidence' and list down the items that may contain DNA Evidence.
- Read the following case study on the Buenos Aires Bombing and identify the relevance of admitting DNA evidence.

On July 1994, the *Asociación Mutual Israelita Argentina* or otherwise known as Argentine Israelite Mutual Association (AMIA) in Buenos Aires was bombed, killing an estimated 85 people and injuring hundreds.[20]

The Investigators belonging to Argentina's AMIA Special Investigation Unit recovered DNA evidence from the site and concluded that it belonged to Ibrahim Hussein Berro, a Hezbollah terrorist. The DNA evidence was analysed at the Chemical Laboratory Division of the Argentine Federal Police wherein upon comparison of the same with the DNA of the victims of the blast, it was established that the DNA did not belong to any of the victims. Hence, it suggests that the same belonged to the Hezbollah operative that conducted that bombing. Subsequently, in 2005 Alberto Nisman, an Argentine prosecutor identified Berro as the bomber.[21]

3.6 Polygraph

Polygraphs are commonly referred to as lie detectors which operate on the premise that deceptive answers to questions produce physiological responses

[20]'Terrorist Bombings in Argentina' (*Jewishvirtuallibrary.org*) <http://www.jewishvirtuallibrary.org/terrorist-bombings-in-argentina> accessed 26 January 2018.

[21]Ben Cohen, 'DNA Discovered at Site Of 1994 AMIA Bombing In Buenos Aires Points To Hezbollah Suicide Attacker' (*Algemeiner.com*, 2017) <https://www.algemeiner.com/2017/07/05/dna-discovered-at-site-of-1994-amia-bombing-in-buenos-aires-points-to-hezbollah-suicide-attacker/> accessed 26 January 2018.

that can be differentiated from those associated with non-deceptive answers. Polygraph testing may be useful when verifying statements of victims and establishing the credibility of witnesses in terrorism cases. In order to effectively examine a person, it is necessary to ensure the following as per the Punjab Forensic Science Agency:

- Copy of CNIC of suspect or parents
- Copy of FIR
- Request letter for polygraph examination
- Suspect must have had proper breakfast and sufficient sleep
- Suspect should not have been tortured for last 24 hours
- Suspect should not have used any illegal drugs for at least 24 hours
- Suspect should not have any injury or physical illness
- Suspect hands must be washed
- Do not tell the suspect about polygraph examination
- Investigation officer is supposed to prepare the case fully before briefing

Despite the availability of polygraph testing in Pakistan, it is not considered to be the most reliable source of evidence. This is because there is no unique physiological pattern or sign of deception. The Supreme Court of United States has also ruled against the use of polygraphic evidence in some federal courts because there is no consensus that polygraph evidence is reliable.

Activity (3.6)

- How does polygraph test infringe an individual's right against self-incrimination and right to life and personal liberty under Article 13 and 9 of the Constitution of Pakistan, 1973, respectively?

3.7 Fire Arms and Tool Marks

Fire Arm Identification is a sub-set of Tool Mark Identification. This is a rampantly used form of forensic science whereby experts can determine if a bullet, cartridge case or other ammunition was fired through a particular firearm. The services available in Pakistan with regard to firearm and tool mark identification are as follows:

- Examination of submitted firearms to determine manufacturer, model, caliber, serial number, and functionality.
- Examination of evidence bullets and cartridge cases to determine (with submitted firearms) if either or both were fired in or from the firearms.
- Examination of evidence ammunition to determine the manufacturer, bullet type, and country of origin (where manufactured).
- Examination of submitted tools in conjunction with evidence tool marks or silicone casts to determine if the tool was used to create the tool mark.
- Restoration of altered, modified, or obliterated serial numbers.
- Analysis of gunpowder patterns on a variety of evidence, using submitted firearms and ammunition to determine the distance from the muzzle to the point of impact.
- Shooting scene reconstruction using trajectory analysis to determine the sequence of two or more events in a particular incident utilizing information derived from the physical evidence.
- Shotgun Shots Pattern Analysis to determine the distance of the shooter from the target.

In order to minimize contamination of evidence the following measures should be followed while packaging the evidence:

- Every evidence exhibit must be packaged separately.
- Evidence submitted for Gun Shot Residue (GSR) analysis must be packaged in hard box instead of cloth bag or paper envelope. Layers of the clothes containing GSR must not touch with the other layers. Clothes must be wrapped by placing a white paper sheet between the layers of clothes before packing it in a hard box.
- For serial number restoration of firearms, area containing obliteration should be marked clearly if there is more than one location of obliteration.
- For trajectory analysis, vehicles must not be washed or cleaned at all prior to examination. Suspected bullet holes must be covered with white paper.
- Seals must be intact and as per mentioned in the docket.

- If firearm is recovered from water or any other liquid, then submit the firearm with the same sample of water or liquid from which it has been recovered.

Activity (3.7)

Read the following case study pertaining to The Irish Republican Army and identify the relevance of forensic evidence in light of the real evidence.

Britain's Home Office used to consistently identify the Irish Republican Army (IRA) as one of the gravest threats to national security. The IRA is a republican paramilitary organization whose principle objective was to change British policy towards Ireland. The emergence of the IRA has its roots in Ireland's 20th-century quest for national independence from Great Britain.

The first Irish Republican Army fought the British in the 1919-1921 Irish War of Independence. The Anglo-Irish treaty concluding the war divided Ireland into a Catholic Irish Free State and Protestant Northern Ireland. Some elements of the IRA opposed the treaty.

The IRA began its terrorist attacks on the British army and police following a summer of violent rioting between Catholics and Protestants in Northern Ireland. For the next generation, the IRA carried out bombings, assassinations and other terrorist attacks against British and Irish Unionist targets.[22]

In pursuit of their objective, the IRA used explosive and incendiary devices to target military, political, and economic institutions.[23] A degree of sophisticated organization was prevalent in the IRA, the supplies of arms were plentiful, and tactics were devised from the top and filtered down to units working on the mainland.[24] The IRA planted and set off hundreds of explosive devices during decades of conflict.

The predominant category of evidence found in IRA cases was real evidence. It is worth reiterating that this is because of the fact that the IRA is well

[22]Amy Zalman, 'Guide to The Irish Republican Army: Understanding The IRA' (*ThoughtCo*, 2017)

<https://www.thoughtco.com/guide-to-the-irish-republican-army-3209135> accessed 26 January 2018.

[23]A. R Oppenheimer, *IRA, The Bombs and The Bullets: A History Of Deadly Ingenuity* (Irish Academic Press 2009).

[24]Gary McGladdery, *The Provisional IRA in England: The Bombing Campaign 1973-1997* (Irish Academic Press 2006).

structured and has access to proper explosive devices such as semtex, nitroglycerine and gelamex. Furthermore, the IRA suspects were known for making multiple explosive devices to use across Britain over a specific time period. This resulted in law enforcement authorities uncovering bomb equipment i.e real evidence before their intended use.

Following real evidence, the most numerically abundant categories of evidence are ballistics, digital and document evidence, and forensic chemical evidence. Ballistic evidence is present more readily in IRA terrorist instances because the suspects are willing to use firearms for protection and escaping. Forensic chemical evidence is discoverable because of the IRA's reliance on explosives and incendiaries.

3.8 Latent Fingerprints

The use of fingerprints is the most oft-used technique in forensic science. The earliest reference to fingerprints was given in the Indian Evidence Act 1872 (which is now reproduced as Article 59 in the Qanun-e-Shahadat Order). One of the earliest cases regarding the validity of fingerprint evidence can be dated back to the 1800s. In 1897, an Indian man was convicted for theft on the basis of fingerprints which were introduced in evidence.[25] Finger print evidence was also upheld in the case of *Emperor vs. Sahdeo*[26] where it was stated that if it was proven by competent expert testimony that two finger impressions made at different times contained points of agreements in their ridge characteristics without any disagreements, no further evidence was required to prove that they were from the same finger.[27]

In the United States of America, it has consistently been held that fingerprint evidence is admissible to prove the identity of the accused where it is competent, relevant and material.[28]

[25] Andre A. Moenssens, 'Admissibility of Fingerprint Evidence and Constitutional Objections to Fingerprinting Raised in Criminal and Civil Cases' (1963) 40 Chicago Kent Law Review, 88.

[26] *Emperor vs. Sahedo,* 3 Nagpur Law Reports 1 (India 1904)

[27] Andre A. Moenssens, 'Admissibility of Fingerprint Evidence and Constitutional Objections to Fingerprinting Raised in Criminal and Civil Cases' (1963) 40 Chicago Kent Law Review, 88.

[28] Andre A. Moenssens, 'Admissibility of Fingerprint Evidence and Constitutional Objections to Fingerprinting Raised in Criminal and Civil Cases' (1963) 40 Chicago Kent Law Review, 91

Activitiy (3.8)

- Watch 'Evidence Collection & Preservation: Latent Fingerprints' by University of Central Oklahoma Forensic Science Institute

  `https://www.youtube.com/watch?v=0wMz-_EKTJE`

- Apply the three principles of forensic science to fingerprint analysis to deduce whether it is a valid form of evidence.

3.9 Autopsy Examinations

Autopsy examinations focus on determining the cause of death by examining a corpse. Post-mortems are regularly performed in criminal cases. An autopsy may also be termed a postmortem or necropsy.[29] The object of the post-mortem examination of a body is to establish its identity when it is unknown, to ascertain the time since death, and determine the cause of death.

The Punjab Forensic Science Agency's department of forensic pathology provides the following:[30]

- A full fledge autopsy service.
- A well established and state of the art autopsy hall for postmortem examination.
- An additional autopsy room for the postmortem of decomposed bodies.
- Fixed and mobile X-ray units to take X-rays of the desired parts of the dead body.
- Histopathology lab, equipped with all necessary and latest instruments which provides the histological/ microscopic findings of the tissue specimens taken from the autopsy or the tissue samples received from outside hospitals or laboratories.
- The forensic pathology has two body storage refrigerator rooms and two body storage freezers for temporary storage of dead body.

[29] Bryan A. Garner, Black's Law Dictionary (8th edn, West Thomson 2004)
[30] Guidelines of Punjab Forensic Science Agency

`http://pfsa.gop.pk/wp-content/uploads/2016/10/PFSAGuidelinesEnglish.pdf`

- Forensic Histopathology services to ascertain cases and manner of death after examination of body tissues from autopsy centers of entire Punjab.

Autopsies are ideally performed by medico-legal experts, however, due to lack of experts all medical officers of the government may perform them as per section 174 Cr.P.C[31]

of Pakistan and Police Rules 1934 section 25.34 and 25.36. Where the CrPC and Police Rules aren't abided by, a doubt is created in the mind of the courts as to whether the post mortem was actually conducted by the Medical Officer or not, ultimately weakening the value of the prosecution's evidence. [32]

[31] Criminal Procedure Code 1898, s.174: **Police to Inquire on Suicide**

1. The officer incharge of a police-station or some other police officer specially empowered by the Provincial Government in that behalf, on receiving information that a person:
   (a) has committed suicide, or
   (b) has been killed by another, or by an animal, or by machinery, or by an accident, or
   (c) has died under circumstances raising a reasonable suspicion that some other person has committed an offence, shall immediately give intimation thereof to the nearest Magistrate empowered to hold inquests, and, unless otherwise directed by any rule prescribed by the Provincial Government, or by any general or special order of the District or Sub-Divisional Magistrate, shall proceed to the place where the body of such deceased person is, and there, in the presence of two or more respectable Inhabitants of the neighborhood, shall make an investigation, and draw up a report of the apparent cause of death describing such wounds fractures, bruises and other marks of Injury as may be found on the body, and stating in what manner, or by what weapon or instrument (if any), such marks appear to have been inflicted.
2. The report shall be signed by such police officer and other persons, or by so many of them as concur therein, and shall be forthwith forwarded to the District Magistrate or the Sub-Divisional Magistrate.
3. When there is any doubt regarding the cause of death, or when for any other reason the police officer considers it expedient so to do, he shall, subject to such rules as the Provincial Government may prescribe in this behalf, forward the body, with a view to its being examined, to the nearest Civil Surgeon, or other qualified medical man appointed in this behalf by the Provincial Government, if the state of the weather and the distance admit of its being so forwarded without risk of such putrefaction on the road as would render such examination useless.

[32] *Mehro Khan vs. Anwar* 2017 PCr.LJN 244

3.9.1 Value of an Autopsy Report

For legal proceedings, a reliable autopsy report becomes pertinent in many cases. However, prosecutors must also note the extent of support the autopsy report may provide to their case. It was held in *Mustaqeem vs Nawab Khan* that the serologist report of bloodstained articles as well as autopsy report of the deceased can only prove the unnatural death of the deceased with the firearm in a particular place but cannot identify the culprit.[33] While in *Mohammad Hassan vs. State*[34] it was held that the purpose and object of an autopsy, is nothing more than that of knowing the cause of death. At best, it could operate as corroboratory evidence.

3.9.2 Challenges

A major procedural challenge faced during the submission of autopsy reports as evidence, is the delay of the report itself. In the case of, *Shahabuddin vs Muhammad Hashim Khan*[35], the medical officer testified to have conducted an autopsy on the body of the deceased 40 minutes prior to the report of the complainant, which cast doubt on the prosecution's case. There was a clear contradiction between the ocular account of the complainant as the incident had not taken place in his presence, nor in the mode and manner that was alleged by him.

A similar case is that of *Zishan vs State*[36], where the co-accused had allegedly slit the throat of the deceased with a dagger following multiple blows in the abdomen. The ocular evidence of the incident was provided by the complainant along with another witness. According to the prosecution, the incident occurred at 10:00 PM, at a place that was at a distance of one kilometer from the police station, however the incident was reported at 12:30 AM, and the autopsy was conducted at 11:45 AM on the following day. This delay in autopsy revealed a real possibility that the complaint was not prepared at the point of time mentioned, therefore casting doubt on the evidence of the case.

The inefficiency and delay by police in sending medical evidence to concerned laboratories can also cause problems in attaining a reliable autopsy report for legal practitioners. Such was the case in *Ghulam Mustafa Alias Baggi*

[33] *Mustaqeem vs. Nawab Khan* -2016 YLR 905
[34] *Mohammad Hassan vs. State* - 2016 YLRN 106
[35] *Shahabuddin vs. Muhammad Hashim Khan* - 2015 PCr.LJ 81
[36] *Zishan vs. State* - 2017 PLD 731

vs State[37], in which the medical officer who performed an autopsy on the body removed certain body parts and sealed them in parcels to send them to the police for further dispatch to the chemical examiner, bacteriologist and histopathologist. These parcels were dispatched to laboratories by the police more than a year after they were received which obviously casted doubts over the whole process. The expert reports from laboratories had not been received till the hearing of the case, therefore, medical evidence was still far from the stage of being a corroboratory piece of evidence.

Self-Assessment Questions

- What are the objectives of a post-mortem/autopsy?
- What evidential value does a post-mortem/autopsy have in the Courts?
- Watch 'The Real CSI: Forensic Pathology and Death Investigation' by University of California Television

`https://www.youtube.com/watch?v=yFPW016ocXI`

3.10 Document Verification

A document is something tangible on which words, symbols, or marks are recorded. These include written instruments to prove a fact. As per the best evidence rule, it is the original version of the physical embodiment of information or ideas, such as a letter, contract receipt, account book, blueprint or x-ray plate. Documentary evidence is evidence supplied by a writing of other document, which must be authenticated before the evidence is admissible in court.[38] Over time, this term has been expanded to cover electronic or digital materials as well, casting doubt on its authenticity and further requiring verification.

3.10.1 National Forensic Science Agency

As per the National Forensic Science Agency[39] 'questioned document' is a term associated to all those documents that are entirely or partially subjected

[37] *Ghulam Mustafa Alias Baggi vs. State* 2014 PCrLJ 893

[38] Bryan A. Garner, Black's Law Dictionary (8th edn, West Thomson 2004)

[39] National Forensic Science Agency (Questioned Documents Laboratory)

`http://www.nfsa.gov.pk/questioned-documents-lab/`

to question for its authenticity or its origin and are therefore, disputed in the court of law. Questioned document analysts evaluate and compare the characters of any signature, handwriting, typewriting, or other marks whose source or authenticity are in dispute with the known standards.

3.10.2 Punjab Forensic Science Agency

The Questioned Documents Section of the Punjab Forensic Science Agency, Lahore is responsible for examining any document about which a question has been raised concerning its authenticity in the court of law. These examinations can take many forms. They include the examination of handwriting and signature to determine its author, the examination of typewriting, the examination of altered documents, the examination of indentations on paper, the non-destructive examination of inks and other types of examinations.

Handwriting Analysis

Handwriting results from a very complicated series of acts, being used as a whole, combination of certain forms of visible mental and muscular habits acquired by long effort. Any disputed handwritten document is analysed by comparing it with routine handwritten scripts written earlier to the questioned and specimens in slow medium and fast pace.

Handwriting examinations involve the comparison of known writing from one or more subjects with the questioned writing. The questioned writing may be on cheques, anonymous and/or threatening letters, bank hold-up notes, wills, mutations etc. Special lighting and magnification techniques and the use of the Video Spectral Comparator (VSC) can frequently reveal the information underneath the obliteration. On the bank cheques, the amount may have been altered. The VSC can reveal the presence of different inks in the amount area.[40]

Signatures Analysis

Signature is the name of the person written by him/her in a document as a sign of acknowledgement. Any disputed document bearing signature of alleged is analyzed by comparing it with routine signatures of the same preferably

[40]Guidelines of Punjab Forensic Science Agency

(`http://pfsa.gop.pk/wp-content/uploads/2016/10/PFSAGuidelinesEnglish.pdf`)

signed prior to the date of questioned and specimens in slow medium and fast pace.

Alteration

A document that contains some change, either as addition or a deletion. Different types of techniques are employed to verify if any attempt of alteration was made.

Erasures

Removal of writing, typewriting or printing from a document, accomplished by either chemical eradication or by an abrasive erasure in which writing is effaced by scratching out with any object.

Obliteration

The blotting out or smearing over of writing to make the original invisible or undecipherable.

Indented Writing

Small indentations / impressions made on the sheet of paper that is immediately below the one on which writing was made. Such writing can be deciphered by electrostatic detection apparatus.

Activity (3.10)

- Read the judgement of Benbrika & Ors vs. The Queen [2010][41] and identify the types of forensic analyses applied therein.

Charges were brought against seven Melbourne men alleging that they were members of a terrorist organization that was fostering or preparing the conduct of a terrorist act in Australia or overseas, with the intention of causing death or serious physical harm in order to advance a political, religious or ideological cause. It was alleged that, compelled by a religious obligation to pursue violent jihad against non-believers, they were intending to detonate one or more explosives or incendiary devices or to use other weapons. Forensic evidence called for the prosecution included:

[41] *Benbrika & Ors vs. The Queen* [2010] VSCA 281; 29 VR 593; 204 A Crim R 457; 247 FLR 1

- DNA evidence that linked two of the accused to the site of an alleged extremist training camp;
- Computer forensic evidence detailing the result of a search of computers and CDs found in the possession of a number of the accused containing violent jihad literature and bomb-making manuals; and
- An explosives expert who provided an opinion that bomb-making manuals found on two CDs in premises occupied by one of the accused could, if followed, produce an explosive.

There was little controversy about any of these items of evidence at the trial. The evidence of the explosives expert was the only part of the forensic testimony that was objected to at trial, other than an objection regarding the admissibility of some physical evidence found by the forensic team at the location of the alleged training camp. These objections were based on the relevance of the material, rather than any challenge to the expertise of the witness or the reliability of their evidence, and both items were ultimately ruled admissible. Interestingly, material gathered by the accused included a manual that provided a range of information on forensic science techniques, suggesting that they were aware, at least to some degree, of the potential importance of this type of evidence in linking them to material evidence of the activity they were undertaking. This conclusion was further supported by discussions between them that were recorded as a result of telephone intercepts.

Summary

The Punjab Forensic Science Agency offers a range of forensic analyses. These are as follows:

- Audio Visual Analysis: Sources of audio and video recordings are of immense importance in assisting in investigations. The Punjab Forensic Science Agency advocates following certain packaging and transportation oversight measures to ensure that forensic evidence remains forensically viable.
- Computer Forensic: Computer forensic services pertain to the practice of collecting, analyzing, and reporting on digitally stored media and computer systems. Computer forensic evidence is crucial in a terrorism case because such data potentially holds a plethora incriminating information. The Punjab Forensic Science Agency advocates following

certain packaging and transportation oversight measures to ensure that forensic evidence remains forensically viable.

- Crime Scene and Death Scene Investigation: These concern the recording and mapping of evidence found at the crime scene by the use of videos, sketches, etc. It is imperative that a crime scene is properly managed i.e. identification of evidence, its collection, protection and documentation so as to ensure that the chain of custody and integrity of the evidence remains intact.
- DNA and Serology: DNA testing refers to the isolation of genetic patterns that characterize the human body, such as saliva or blood. It is remarkable because of its degree of precision in linking a perpetrator to a crime scene.
- Forensic Photography: It is the visual documentation and representation of the crime scene and correlating evidence.
- Polygraph: This testing refers to the process of 'lie detection'. It is especially useful when assessing the credibility of the statements of witnesses, victims, or those accused in trials.
- Fire Arms and Tool Marks: It is the process of identifying fire arms and tool marks quintessentially refers to the process whereby experts can utilize a bullet, cartridge, or shell casing to trace a particular firearm. The Punjab Forensic Science Agency advocates that certain safety measures be followed to minimize the contamination of evidence.
- Latent Fingerprints: Fingerprint evidence and identification allows investigative agencies to trace a specific fingerprint to the correlating individual.
- Autopsy Reports or Pathology: This refers to the determination of the cause of death by examination of the deceased's corpse.
- Document Verification: It is the process wherein analysts evaluate documents that are subject to uncertainty as to their authenticity such as handwriting or signature analysis.

Reflect and Review

Look through the points listed below: Are you ready to move on to the next chapter?

Ready to move on: I am satisfied that I have sufficient understanding of the principles outlined in this chapter to enable me to go on to the next chapter.

Need to revise first: There are one or two areas I am unure about and need to revise before I go on to the next chapter.

Need to study again: I found many or all of the principles outlined in this chapter very difficult and need to go over them again before I move on.

Tick a box for each topic

I can list the types of forensic analyses services offered by the Punjab Forensic Science Agency and the KP Forensic Labs.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can describe the importance of specific methods of forensic analyses.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

I can outline the precautions that must be taken in transporting forensic evidence.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

If you ticked **'need to revise first'**, which sections of the chapter are you going to revise?

3.1. Audio and Visual Analyses

☐ Must Revise ☐ Revision Done

3.2. Computer Forensics

☐ Must Revise ☐ Revision Done

3.3. Crime Scene and Death Scene Investigation

☐ Must Revise ☐ Revision Done

3.4. DNA and Serology

☐ Must Revise ☐ Revision Done

3.5. Forensic Photography

☐ Must Revise ☐ Revision Done

3.6. Polygraph

☐ Must Revise ☐ Revision Done

3.7. Fire Arms and Tools Marks

☐ Must Revise ☐ Revision Done

3.8. Latent Fingerprints

☐ Must Revise ☐ Revision Done

3.9. Autopsy Examinations

☐ Must Revise ☐ Revision Done

3.10. Document Verification

☐ Must Revise ☐ Revision Done

Chapter 4

Legal Framework for Forensics in Pakistan

Contents

Introduction

In Pakistan, forensic evidence is regulated by both statutory law and jurisprudence. The law in this regard essentially recognizes the damning consequences for the suspect when forensic evidence is adduced. Therefore, the reliability of forensic evidence is crucial. Ergo, this chapter addresses three questions that normally arise within the context of the use of forensics in the judicial process: the admissibility of forensic evidence; the evidentiary value of the forensic evidence obtained from experts; and, the constitutional validity of the use of forensic techniques.

Learning Outcomes

By the end of this Chapter and the relevant readings you should be able to:

- Explain the legal framework that governs the admissibility of forensic evidence in criminal and counter-terrorism cases
- Explain the importance of admitting forensic evidence in counter-terrorism cases
- Define an expert
- Explain why forensic evidence is considered as weak evidence in general criminal cases.

Essential Reading

- Anti-Terrorism Act, 1997
- The Code of Criminal Procedure, 1898
- Qanun-e-Shahadat, 1984
- Investigation for Fair Trial Act 2013
- Sikander Ali Lashari vs. The State, 2016 YLR 62
- Muhammad Sadiq alias Hussain vs. The State and others, 2016 PCrLJ 1390
- Sultan vs. The State, 1987 SCMR 1177

Recommended Reading

- Commentaries on Anti-Terrorism Act, 1997 by Mehram Ali Balli

- The Code of Criminal Procedure, 1898: Amendments and Case Law up-to-date, Volume I and II by Muhammad Mahmood
- A Simplified Guide to DNA Evidence, National Forensic Science Technology Centre
- Commentaries on the Qanun-e-Shahadat, 1984 by Kabir Khan
- Land Acquisition Collector Sarghoda vs. Muhammad Sultan, PLD 2014 S.C. 696
- Babar Ahmad vs. The State, 2017 YLR 153 [Gilgit Baltistan Chief Court]
- Asfandyar vs. Kamran 2016 SCMR 2084
- Azeem Khan vs. Mujahid Khan and others 2016 SCMR 274
- Omparkash vs. The State of Tamil Nadu, AIR 2013 SC 825
- Bahader Khan vs. The State, AIR 1966 P H 111
- Ziyauddin Burhanuddin Bukhari vs. Brijmohan Ramdass Mehra and others, AIR 1975 Supreme Court 1788,
- R.M.Malkani vs. State of Mahrashtra, AIR 1973 Supreme Court 157
- Law Society of India vs. Fertilizers and Chemicals, AIR 1994 Ker 308
- Regina vs. Gilbert Thomas Patrick McNamee
- R vs. Esseghaier, 2015 ONSC 5855

4.1 Legal Framework for Forensics in Pakistan

The Legal Framework relating to forensics is found in the Qanun-e-Shahadat Order as well as in the Code of Criminal Procedure. Additionally, the Anti-Terrorism Act of 1997 has made special provision for the admissibility and conviction of accused persons solely on the basis of electronic or forensic evidence. Furthermore, the Investigation for Fair Trial Act 2013 makes provision for the admissibility of evidence obtained through electronic surveillance or interception after a special warrant has been issued in this regard. It must be noted that, the Anti-Terrorism Act 1997 is a special law and Section 27B, which deals with the admissibility of forensic evidence, takes precedence over the other laws that provide legal cover to forensic science admissibility.

4.2 Admissibility of Forensics and its Evidentiary Value

The purpose of forensic evidence is to provide guidance to those conducting criminal investigations and is regulated by both statutory law and jurisprudence. Given the serious consequences for the suspect, the reliability of forensic evidence is crucial. Within the context of the use of forensics in the judicial process, there are three questions that normally arise. Firstly, the admissibility of forensic evidence and the evidentiary value of the forensic evidence obtained from experts. Lastly, the constitutional validity of the use of forensic techniques (such as DNA data basing, fingerprint analysis etc.).

4.2.1 Article 59 of the Qanun-e-Shahadat Order, 1984

> *When the Court has to form an opinion upon a point of foreign law, or of science or art, or as to identity of hand-writing or finger impressions [or as to authenticity and integrity of electronic documents made by or through an information system] the opinion upon that point of persons specially skilled in such foreign law, science or art, or in questions as to identity of hand writing or finger impressions [or as to the functioning, specifications, programming and operations of information systems], are relevant facts.*
>
> *Such persons are called experts.*

After receiving summons, the expert witness has to appear before the Court where the evidence is probed for uncertainty, inconsistency etc. in the following

order:

(i) Oath

(ii) Examination-in-chief

(iii) Cross-examination

(iv) Re-examination

(v) Court Questions

Reports of experts are not immune from judicial scrutiny.[42] There is no hard and fast rule as to the weight given to an Expert's report. Where a case can be proved through reliable, truthful and confidence-inspiring direct evidence, the report of the Expert could lose its value.[43] Expert evidence is in the nature of confirmatory or explanatory of direct or other circumstantial. Confirmatory evidence cannot outweigh direct evidence.[44]

Expert evidence may not necessarily be relied upon as it is not binding on the Court.[45] For the purposes of giving an opinion under Article 59, the witness first has to establish expertise in the field through academic qualification or experience. Without such validation, an opinion cannot be taken as having evidentiary value for proving a fact in issue.[46] The nature of expert evidence is confirmatory and where there is direct evidence which is definite, confirmatory evidence is not of much significance.[47] However, in cases of terrorism, Section 27B becomes operative (discussed subsequently) and veracious expert evidence in the form of forensics can be conclusive in attaining a conviction.

There is no conclusive rule that lays down when a person becomes an expert. As a general rule, it is the discretion of the Court to determine whether the qualifications of a witness are such that would qualify them to be considered experts. During Court proceedings, ample opportunities are given to inquire into the background of a witness in order to examine whether or not they qualify as an expert.

The opinion of an expert has been given the status of 'relevant facts' only and is therefore to be considered with caution and to be taken subject to particular facts and circumstances of a case.[48] The report of an expert is

[42] *Nawad alias Nawabi vs. The* State, 1985 PCrLJ 2217
[43] *Muhamamd Hani vs. The State*, PLD 1993 SC 895
[44] *Ibid.*
[45] *Law Society of India vs. Fertilizers and Chemicals*, AIR 1994 Ker 308
[46] *Land Acquisition Collector Sargodha vs. Muhammad Sultan,* PLD 2014 SC 696
[47] *Muhammad Aslam vs.* State, 2005 PCrLJ 1352
[48] *Manzar Masood vs. Bank Islami Pakistan Ltd*, 2017 CLD 1497 [Karachi]

given the status of circumstantial evidence, which in the absence of direct evidence, is weak unless corroborated by other strong pieces of evidence. If the expert rendering the opinion is not examined in Court to substantiate the report or cross-examined, the report would lose its efficacy.[49]

Before expert evidence can be admitted, two things must be proved:[50]

(i) The subject is such that expert testimony is necessary

(ii) That the witness in question is really an expert

The most essential requirement of law with regard to Article 59 is that the expert be a master in the relevant field through special study, training, experience or extensive research work.[51] It has been held by the Peshawar High Court that the opinion of a Finger Print Expert could point to the complicity of accused in the crime but was not conclusive where other questions were left unanswered.[52] Where there is no other independent evidence showing where the finger prints came from, in whose presence they were taken, and questions as to whether the person taking the fingerprints could take them in the absence of the concerned person, or whether such official could accept the fingerprints impressed on a document in his absence are pertinent questions that need to be answered. In the absence of such other evidence, finger prints alone could not provide a dependable foundation for recording or maintaining the conviction of an accused. [53]

Chemical examiners and forensic experts when contradictory to oral testimony of related and interested witnesses, is to be believed and it always prevails upon ocular evidence produced by interested parties.[54]

Self-Assessment Questions

- Define an 'expert'.
- Why is expert evidence not binding in the Court?
- How does the Court probe expert evidence for uncertainty and inconsistency?

[49] *Fida Muhammad vs. Umar Khitab*, 2013 CLC 1171 [Peshawar]
[50] *Jarat Kumari Dassi vs. Bissessur Dutt*, ILR 39 Cal 245
[51] *Abdul Ahad vs. The State*, PLD 2007 Pesh 83
[52] *Bahader Khan vs. The State*, 2012 PCrLJ 24 [Peshawar]
[53] *ibid*
[54] *Muhammad Irfan vs. The State*, PLD 2008 Kar 182

- What two conditions must be proven prior to the admissibility of forensic evidence?

Activity (4.2.1)

- Watch 'What is an expert witness?' and distinguish between a fact witness and an expert witness.

`https://www.youtube.com/watch?v=Wl92bHtrQvA`

4.2.2 Article 164 of Qanun-e-Shahadat Order, 1984

In such cases, as the Court may consider appropriate, the Court may allow to be produced any evidence that may have become available because of modern devices or techniques.

With regard to Closed Circuit Television (CCTV) footage it has been held that pursuant to the insertion of Article 164, the evidence collected through modern devices is admissible as valid.[55] However, mere production of CCTV footage as a piece of evidence in Court is not sufficient to rely upon unless it is proved to be genuine. In order to prove the genuineness of such footage, it is incumbent upon the defence or prosecution to examine the person who prepared the footage.[56]

In the case regarding the terrorist attack in Dera Ghazi Khan on 15.12.2009[57], Article 164 was relied on to accept the confession made by the defendant during a press conference which was saved through a CD.[58]

Moreover, in a judgment by the Federal Shariat Court in 2010, *Muhammad Shahid Sahil vs. The State*[59], it was held with regard to DNA testing that with the development of scientific knowledge, provisions of the Code of Criminal Procedure and QES Order, 1984 have to be construed afresh. The word 'expert' used in Article 59 of the QES Order, 1984 has to be interpreted in light of latest discoveries. However, a distinction must be drawn between an

[55] *Babar Ahmad vs. The State*, 2017 YLR 153 [Gilgit Baltistan Chief Court]
[56] *Asfandyar vs. Kamran*, 2016 SCMR 2084
[57] 'BBC News - Pakistan Market Blast 'Kills At Least 27' (*News.bbc.co.uk*, 2009) <http://news.bbc.co.uk/2/hi/south_asia/8413579.stm> accessed 12 December 2017.
[58] *Muhammad Sadiq alias Hussain vs. The State and others*, 2016 PCrLJ 1390
[59] *Muhammad Shahid Sahil vs. The State,* PLD 2010 FSC 215

opinion and the report of an expert. A certain category of the report, e.g. the report of a Chemical Examiner, has been duly declared as evidence but in other cases the report of an expert will have to be proceed through the deposition of the expert who issues that report. The opinion of an expert, is however relevant under Article 59 of the QES Order. Article 164 has resolved the problem by enacting that in such cases that the Court may consider appropriate, it may allow to be produced any evidence that becomes available because of modern devices or techniques.

As per a judgment of the superior judiciary in *Muhammad Asif vs. The State*[60], the polygraph test which originated in the United States of America is considered to be highly unreliable. Normally this test is not administered to an accused charged with criminal offences. However, the test is used for ancillary purposes i.e. ascertaining the integrity of employees dealing with money and financial matters by banks and corporations. In light of this reasoning it was held that the polygraph test is of no avail to the prosecution and cannot be relied upon.

Self-Assessment Questions

- In your opinion, in which cases do the Courts admit forensic evidence under Article 164 of the Qanun-e-Shahdat Order, 1984?

Activity (4.2.2)

Read the following cases and compare as to how the admissibility of forensic evidence differs in Pakistan from the UK.

Mir Sahib Khan vs. Zareen Khan And 3 Others[61]

The appellant was convicted of murder and sentenced to death. The Prosecution case is that the complainant along with his brother and uncle were ambushed and shot at. The deceased, then injured was taken to the hospital for treatment, but died on the way. Thereafter the dead body was brought back and taken to Police Station. During trial, a medical examiner was examined, who conducted the autopsy on the deceased's body. He concluded that six gunshot wounds were found on the body. Recoveries of blood-stained earth, nine empties of Kalashnikov from the spot, blood-stained garments of the deceased and other formal relevant facts were also produced before the Court. The Trial Court placing reliance on the ocular testimony having

[60] *Muhammad Asif vs. The State*, 2008 MLD 1385
[61] *Mir Sahib Khan vs. Zareen Khan and 3 Others*, 2009 YLR 1849

been corroborated by medical evidence, recoveries and abscondence, held the appellant guilty and sentenced him to death.

The Learned counsel for the appellant contended that the impugned conviction is not sustainable as the trial Court has failed to appreciate evidence in its true perspective. One of the arguments presented by the Learned Counsel for the appellant was that the medical evidence did not corroborate with the ocular testimony, rather it contradicts because one of the entrance wounds on the body of deceased was blackening and scarring which was not possible from the distance of five paces from which the shots were allegedly fired. Meaning thereby that the occurrence did not take place in the mode and manner described by the eye-witnesses.

The Court observed scientific technology has developed in all areas of life and the field of arms and ammunition is ahead of all. New sophisticated weapons and ammunitions have been invented. Their impacts are quite different. In this case, a tracer bullet was fired. Since it has burning and blazing quality, it can result in the blackening of the wound.

In the instant case, there were six entrance wounds on the body of the deceased. Five wounds had no blackening or scarring but only wound No.2 had it and we conclude that the distance of fire being the same, such blackening and scarring could be possible with a tracer bullet, which could be in the chamber of the gun, and the eye-witnesses cannot be discarded or disbelieved alone on the point that one of the inlet wounds was having around, scar and blackening, which was not possible from the flame of gun, due to the long distance of fire. The approximate time durations in between death and the post-mortem also commensurate with the testimony of the eye-witnesses. So, the medical evidence is not in conflict with the statements of eye-witnesses.

The Forensic Science Laboratory Exh. P. W.8/5 conveys that the nine empties, Exh.P-1 to Exh.P-9, recovered from the scene of occurrence vide memo. Exh.P.W.6/1 were fired by two different weapons and the eye-witnesses have nominated two assailants, including the convict-appellant. Thus, the Forensic Science Laboratory report is also strongly corroborating the ocular testimony.

The occurrence took place in day light. The assailants were known. According to Forensic Science Laboratory report, the empties recovered from the spot were fired by two weapons and only two persons have been charged for the qatl-e-amd of deceased. One is the convict-appellant and the second is absconder. Therefore, we believe that in such circumstances, substitution or false implication of someone as accused is not expected.

In light of the same the Peshawar High Court upheld the death sentence. Resultantly, the appeal is found devoid of force and dismissed.

Regina vs. Gilbert Thomas Patrick McNamee[62]

McNamee (hereinafter referred to as 'M') appealed against his conviction for conspiracy to cause explosions. M had worked at premises ostensibly used to manufacture electronic gaming machines, but which had been employed in the construction of IRA bombs.

Fingerprint evidence linked M to one explosive device and two caches of detonation equipment found on the UK mainland. Amongst the recovered items were circuit boards possessed of design characteristics of sufficient similarity to the board used in the Hyde Park explosion of 1982 to enable the prosecution to proceed on the basis that M was also responsible for the construction of that device.

At trial, M maintained that he was unaware that the workshop was producing explosive devices and that his fingerprints had been transferred during the course of, what he believed to be, innocent work. Following a referral from the Criminal Cases Review Commission, M successfully maintained that significant non-disclosure of material linking others to the devices and fresh evidence casting doubt on the veracity of the forensic evidence combined to undermine the safety of his conviction.

4.2.3 Section 510, Code of Criminal Procedure, 1898

Any report purporting to be a report, under the hand of any Chemical Examiner or Assistance Chemical Examiner to Government [or of the Chief Chemist of Pakistan Security Printing Corporation, Limited] or any Serologist, finger print expert or fire arm expert appointed by Government upon any matter or thing duly submitted to him for examination or analysis and report in the course of any proceeding under this Code, may without calling him as a witness, be used as evidence in any inquiry, trial or other proceeding under this Code:

Provided that the Court may [if it considers necessary in the interest of justice] summon and examine the person by whom such report has been made.

[62] *Regina vs. Gilbert Thomas Patrick McNamee,* 1998 WL 1751094.

It has been held that Section 510 is an exception to the general rule laid down that all evidence has to be taken in the presence of the accused. It is a departure from the elementary rule of law that unless evidence is given on oath, and is tested by cross-examination it is not legally admissible against the party affected. It makes the report of an expert, mentioned in the section, admissible in evidence without calling them as a witness. The reason behind this is to avoid expense, delay and inconvenience which would be entailed if the expert is made to produce evidence at every trial of a criminal case.[63]

The proviso to Section 510 contains the word 'may' as opposed to 'shall' which makes it clear that the Court has a discretion to receive the report in evidence without proof or to summon and examine the expert before using the report as evidence. As per the Court, the requirements under the section are that:

(i) Original report shall be put in evidence

(ii) Report must be formally tendered

(iii) Report must be 'under the hand' of the expert

(iv) If the report alone is to be considered sufficient, it should contain all the information which the officer himself/herself would have been able to furnish if he had been examined as witness.

It was further held that where the report is incomplete or cryptic, it is preferred that the report provide reasons for the opinion expressed. Setting out reasons will help to clarify and furnish a valuable guide to the parties and Court in testing the value attached to the opinion.

The Court has the power to summon and examine an officer whose report has been used as evidence where such an application is made by the prosecution or the accused. Where such an application is not made, the inference is that the right and opportunity of cross-examination was provided and it did not suffer from any infirmity or blemish. The Court further went on to observe that:

> *There is no doubt that the provision of law contained in section 510, Cr.P.C. is of an exceptional nature. It is, however, deliberately enacted by the Legislature and the Courts are bound to give effect to it so long as it remains on the statute book whatever may be said of the wisdom and the policy underlying it. It can hardly be open to the Courts to render the enactment nugatory by refusing to*

[63] *Sultan vs. The State*, 1987 SCMR 1177

> *attach any weight to the reports in question. If they are not to have any weight, there would be no object in making them admissible in evidence. The intention of the Legislature is that they should have the same value as they would have if they were formally proved by the sworn testimony. It is always open to the Courts to call the expert when this course is deemed to be necessary in the interest of justice.*

The admissibility of a DNA test under Section 510 has been subject to debate. In a recent judgment of the Supreme Court it was held that production of a DNA test, keeping in view the provision of Section 510, Cr.P.C., wherein, the report of a biochemical expert on DNA (a biochemist) is not covered, was held to be un-admissible. There is a general air of suspicion around DNA tests wherein the Court observed that in the recent past many scandals in USA, UK and other jurisdictions have surfaced where desired DNA test reports were procured by contaminating samples. Accordingly, stringent laws have been made to prevent contamination of samples and for securing and preserving material to correlate with the samples of the parties. The DNA test report is an expert opinion and even if it admitted into evidence and relied upon, it is not sufficient to connect the necks of the appellants with the commission of the crime when the bulk of evidence has been held as unbelievable. To ensure fair-play and transparency, the samples of the parties should be taken in the presence of an independent authority, such as a Magistrate, to dispel the chances of fabrication of evidence through corrupt practices.[64]

The submission of forensic evidence in terrorism trials naturally results in an interface between the former and criminal evidence. Therefore, it is imperative that scientific experimentation be successfully translated into legal proof.

Self-Assessment Questions

- Highlight the reasons as to why Section 510 of the Code of Criminal Procedure, 1898 is an exception to the admissibility of forensic evidence.
- What is the admissibility criteria of forensic evidence under Section 510 of the Code of Criminal Procedure, 1898?

4.2.4 Section 27B of the Anti-Terrorism Act, 1997

In 2014 amendments were made to the ATA, whereafter a person can be convicted solely on the basis of electronic and forensic evidence provided that

[64] *Azeem Khan vs. Mujahid Khan and others*, 2016 SCMR 274

the Court is satisfied as to the genuineness of such evidence.

> *Notwithstanding anything contained in this Act or Qanun-e-Shahadat, 1984, or any other law for the time being in force, a person accused of an offence under this Act may be convicted on the basis of electronic or forensic evidence or such other evidence that may become available because of modern devices or techniques referred to in Article 164 of the Qanun-e-Shahadat, 1984.*
>
> *Provided that the Court is fully satisfied as to the genuineness of such evidence.*

Regarding the admissibility of CDs and USBs, it was decided by the Karachi High Court that as per Section 27B of the ATA, an accused can be convicted on the basis of electronic or forensic evidence and any other evidence that becomes available through the use of modern devices. Where the Court is deciding a case for ATA offences in which capital punishment may be awarded if the charge is proved, it is incumbent upon the Court to provide a fair and reasonable opportunity of defence to the accused which is a basic and foremost pre-requisite of administration of criminal justice. The Court referred to the Indian case of *Omparkash vs. The State of Tamil Nadu*[65] where it was held that:

> *A Judge trying a criminal case has a sacred duty to appreciate the evidence in a seemly manner and is not to be governed by any kind of individual philosophy, abstract concepts, conjectures and surmises and should never be influenced by some observation or speeches made in certain quarters of the society but not in binding precedents. He should entirely ostracise prejudice and bias. The bias need not be personal but may be opinionated bias. It is obligation to understand the case of the prosecution and the plea of the defence in proper perspective, address to the points involved for determination and consider the material and evidence brought on record to substantiate the allegations and record his reasons with sobriety sans emotion.*

Forensic and electronic evidence can ensure that a Judge is able to decide a case sans emotions, based solely on the availability of scientific findings. The Karachi High Court also relied on international jurisprudence to further validate their argument regarding the admissibility of electronic documents

[65] *Omparkash vs. State of Tamil Nadu*, AIR 2013 SC 825

and evidence. The judgment of the Indian Supreme Court was quoted where in it was held that 'tape records of speeches were "documents"... and they were admissible in evidence on satisfying the following conditions... (a) the voice of the person alleged to be speaking must be duly identified by the maker of the record or by others who know it (b) the accuracy of what was actually recorded had to be proved by the maker of the record and satisfactory evidence, direct or circumstantial, had to be there so as to rule out possibilities of tampering with the record and (c) the subject matter recorded had to be shown to be relevant according to rules of relevancy found in the Evidence Act.'[66]

The Court quoted another Indian Supreme Court case[67] wherein it was held that a tape-recorded conversation is admissible provided that the conversation is relevant to the matters in issue, that there is identification of the voice and that the accuracy of the conversation is proved by eliminating the possibility of erasing the tape record. In view of these judgments, it was held by the Court that the accused has an inalienable and incontrovertible right to get copies of the CD and USB for his defence by application of Article 27B ATA and Article 164, QES.

Activity (4.2.4)

- In your opinion, can a perpetrator be solely convicted on the basis of forensic evidence in Counter-Terrorist cases, and why?
- What conditions must forensic evidence must satisfy in order to be admissible in Court?
- Explain the duty of a Judge hearing a counter-terrorism case.

4.2.5 Investigation for Fair Trial Act, 2013

The Investigation for Fair Trial Act, 2013 (IFTA) serves a dual purpose.

First, it provides for the collection of evidence by means of modern techniques and devices to effectively prevent scheduled offences. The IFTA recognizes the effectiveness of investigative techniques such as covert surveillance, human intelligence, property interference, wiretapping and communication interception in the administration of justice. Intelligence agencies may lawfully rely on

[66] *Ziyauddin Burhanuddin Bukhari vs. Brijmohan Ramdass Mehra and others*, AIR 1975 Supreme Court 1788, reliance on *R. Maqsud Ali* (1945) 2 All ER 464.

[67] *R.M.Malkani vs. State of Mahrashtra*, AIR 1973 Supreme Court 157

covert investigative measures by successfully securing a warrant in accordance with the framework of the IFTA.

Second, the IFTA regulates the powers of law enforcement and intelligence agencies which operate within the general paradigm of investigation. The IFTA prevents such agencies from using their powers arbitrarily. This ensures that investigative agencies exercise their powers in a permissible and fair manner, in accordance with the law, and under proper executive and judicial oversight.

The IFTA applies to:

- all citizens of Pakistan within or outside Pakistan,
- all persons within Pakistan or on board any ship or aircraft registered in Pakistan; and,
- all transactions or communications originated or concluded within Pakistan or originated or concluded outside Pakistan by any person.

(i) **Who is an Applicant?**

In accordance with Section 3(a)[68], an applicant under the IFTA refers to:

- the Directorate-General Inter-Services Intelligence,
- the three Services Intelligence Agencies; and,
- Intelligence Bureau and Police.

(ii) **The Process of Applying for a Warrant**

Applicants must first notify an appropriate officer not below BPS-20 or equivalent to act as a representative for the purpose of making an application.[69]

Prior to making an application, an official of an applicant must prepare a report of suspicious behaviour, complete with supporting material, that characterises the behaviour of a person who may commit or is somehow connected to the commission of a scheduled offence.[70]

Thereafter, the official of the applicant must present the report before the Federal Minister for Interior for permission to make an application

[68]Section 3(a) of the Investigation for Fair Trial Act, 2013 – 'applicant' means, Directorate-General Inter-Services Intelligence Agencies, Intelligence Bureau and Police.

[69]Section 4 of the Investigation for Fair Trial Act, 2013.

[70]Section 5 of the Investigation for Fair Trial Act, 2013.

to a Judge of the High Court.[71]

Upon the making of an application, a judge may, upon the consideration of certain factors set out in Section 10, issue a warrant of surveillance or interception.

Any required data is to be given by 'service providers', such as telecom operators or internet service providers. They will have indemnity, which means citizens can't sue them for handing over their data.

(iii) **Types of Evidence**

The warrant of surveillance or interception authorizes the following acts:[72]

- the interception and recording of telephonic communication of the suspect with any person;
- video recording of any person, premises, event, situation, etc;
- interception, recording or obtaining of any electronic transaction which includes, inter alia, emails and SMS etc;
- interception of equipment used in the communication in respect of which the warrant was issued, which includes, inter alia, telephones, cell phones, mobile sims, and electronic databases;
- collection of evidence through any modern devices in addition to the ones mentioned above;
- use of human intelligence;
- covert surveillance and property interference, and;
- access to information or data in any form related to a transaction, communication or its content.

(iv) **Admissibility of Material Obtained Under the Warrant**

- Section 23

  It establishes that notwithstanding anything contained in the Qanun-e-Shahadat, 1984 or any other law in force in 2013, evidence such as data, information, documents or any other material collected under the Act shall be admissible as evidence in legal

[71]Section 6 of the Investigation for Fair Trial Act, 2013
[72]Section 16 of the Investigation for Fair Trial Act, 2013

proceedings. Furthermore, any information collected prior to the coming into force of the IFTA shall remain admissible.

- Section 25

  It refers to the circumstances where an analysis of intercepted material collected pursuant to a warrant of surveillance or interception is required. Such an analysis may be carried out by a person who is deemed suitably qualified, trained or experienced in conducting surveillance or interception who is nominated by the applicant or the Federal Government as an expert for analysis of the intercepted material in accordance with Section 3 (f). Such a person is also deemed an expert under section 510 of the Code of Criminal Procedure, 1898. The report of such a person is given the same effect as the reports of those identified as experts under section 510 of the Code of Criminal Procedure.

- Section 26

  It establishes that any person who fails to ensure complete secrecy of the process while performing any given function under the Act, will be subject to penalization. This extends not only to any punishment he may receive under other applicable laws and rules, but also to imprisonment of up to 5 years and/or a fine up to ten million rupees.

  Section 26, in effect, essentially prevents individuals from compromising the future capabilities of intelligence gathering.

Self-Assessment Questions

- In your opinion, does the IFTA do an adequate job in regulating the powers of investigating agencies? Do the powers of the investigating agencies in your opinion contravene the right to a private life?
- Give a brief overview of how a warrant may be secured under the IFTA? Does this
- What evidence may be permissibly collected under a successfully obtained warrant?

Activity (4.2)

- Read 'How Forensic DNA Evidence can lead to Wrongful Convictions' by Naomi Elster and describe why DNA tests are not given due weightage

in some jurisdictions?

- Read 'A Simplified Guide to DNA Evidence' and explain why some DNA tests are admissible in Court while others are not.
- Watch 'Forensic Evidence used in UK Courts' and briefly describe the applicability of forensic evidence in judicial proceedings in the UK and draw a comparison as to how they differ from Pakistan.

`https://www.youtube.com/watch?v=GTz_ZoeH7_g`

Summary

In Pakistan, different aspects of forensic evidence are governed by a range of statutory provisions.

Article 59 of the Qanun e Shahadat Order, 1984 allows for expert witnesses to give their opinion on a wide range of issues that include but are not limited to forensic sciences. The report of expert witnesses is subject to judicial scrutiny.

Article 164 of the Qanun e Shahadat Order, 1984 promulgates that evidence that has become available because of modern devices may be produced before a court.

Section 510 of the Code of Criminal Procedure, 1898 allows for a report by one of a number of listed experts to be used as evidence in a trial. Section 510 reserves the right for the court to summon and examine the person who developed the report.

Article 27B of the Anti-Terrorism Act, 1997 establishes that a person accused of an offence may be convicted on the basis of electronic or forensic evidence, provided, however, that the court is fully satisfied as to the genuineness of such evidence.

Investigation Fair Trial Act, 2013 provides for the collection of evidence by means of modern techniques and devices to effectively prevent scheduled offences whereby intelligence agencies may lawfully rely on covert investigative measures by successfully securing a warrant in accordance with the framework of the IFTA. Moreover, it also regulates the powers of law enforcement and intelligence agencies which operate within the general paradigm of investigation.

Reflect and Review

Look through the points listed below: Are you ready to move on to the next chapter?

Ready to move on: I am satisfied that I have sufficient understanding of the principles outlined in this chapter to enable me to go on to the next chapter.

Need to revise first: There are one or two areas I am unure about and need to revise before I go on to the next chapter.

Need to study again: I found many or all of the principles outlined in this chapter very difficult and need to go over them again before I move on.

Tick a box for each topic

List the laws governing the admissibility of evidence in counter-terrorism Court proceedings.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

Describe the law that governs forensic sciences, evidence, and reports under the Qanun-e-Shahdat Order, 1984.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

Explain the law governing forensic evidence under the Code of Criminal Procedure, 1898

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

Explain the relevance of forensic evidence under the Anti-Terrorism Act, 1997.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

If you ticked **'need to revise first'**, which sections of the chapter are you going to revise?

4.1. Legal Framework for Forensics in Pakistan

☐ Must Revise ☐ Revision Done

4.2. Admissibility of Forensics and its Evidentiary Value

☐ Must Revise ☐ Revision Done

Chapter 5

Procedural Challenges: Examples from Case Law

Contents

Introduction

This chapter addresses various procedural challenges that you may face when attempting to rely on forensic evidence in courts. These challenges may arise at any given point from the initial investigation phase, to the transport of evidence, to actual attempted reliance on evidence in the courtroom.

Learning Outcomes

By the end of this Chapter and the relevant readings you should be able to:

- Identify the various procedural challenges a prosecutor may face in judicial proceedings

Essential Reading

- Muhammad Wali Shah vs. The State, 2017 PCrLJ 779
- Samander alias Qurban vs. The State, 2017 MLD 539
- Saifullah alias Saifee vs. The State, 2017 YLR 182
- State vs. Sadam, 2016 PCrLJ 1815
- Mustaqeem vs. Nawab Khan, 2016 YLR 905
- Azeem Khan vs. Mujahid Khan, 2016 SCMR 274
- Muhammad Nawaz vs. The State, 2009 PCrLJ 506
- Abbas vs. The State, 2008 SCMR 108
- Nawad alias Nawabi vs. The State, 1985 PCrLJ 221

5.1 Murder

The following case law are illustrative examples of possible procedural deficiencies contextualized within the paradigm of specific terrorism offences.

5.1.1 Muhammad Wali Shah vs. The State

The weapon of offence had not been sent to the Forensic Science Laboratory for chemical analysis as to whether it was stained with blood matching with deceased or not. Prosecution failed to bring on record any cogent reason as to why such important and vital piece of evidence was not sent to

the Forensic Science Laboratory, which created a dent in the prosecution case. Recovery of weapon of offence, in circumstances, became inconsequential.[73]

5.1.2 Samander alias Qurban vs. The State

The conviction of the petitioner under S. 7 of the ATA was set aside due to dents in the case of the prosecution. It was observed that there was a delay of twenty days in sending the crime weapons to the Forensic Science Laboratory despite the fact that the Laboratory was within the city. This was enough to establish that the recovery of crime weapons was not made from the possession of the accused/petitioner as was claimed by the prosecution.[74]

5.1.3 Mustaqeem vs. Nawab Khan

There was no documented chain of custody in this case. The empties recovered from the crime scene were sent to the Forensic Science Laboratory after a delay of eleven days and there was no documentation of where they had been before they were dispatched. In light of this, a positive report of the Forensic Science Laboratory that connected the accused to the crime was discredited and considered inadmissible.[75]

5.1.4 Muhammad Nawaz vs. The State

A conviction cannot be based on a positive report by the FSL only. Insofar as positive report of Forensic Science Laboratory is concerned, the same is useless for the prosecution because admittedly the empties were sent to the said Laboratory with the delay of twenty days after the occurrence.[76]

5.1.5 Abbas vs. The State

Where the crime empties and the weapon of offence are both sent together to the Forensic Laboratory, the findings of the Laboratory become inconsequential and cannot corroborate the case of the prosecution.[77]

[73] *Muhammad Wali Shah vs. The State*, 2017 PCrLJ 779
[74] *Samander alias Qurban vs. The State,* 2017 MLD 539
[75] *Mustaqeem vs. Nawab Khan*, 2016 YLR 905
[76] *Muhammad Nawaz vs. The State*, 2009 PCrLJ 506
[77] *Abbas vs. The State,* 2008 SCMR 108

5.1.6 Nawad alias Nawabi vs. The State

The Court found that the report of Ballistic Expert in the case in hand is highly defective, inasmuch as;

(i) it is not on the prescribed form;

(ii) it does not show as to when the crime empty and the crime weapon were received in the Office;

(iii) it does not contain reasons for the opinion.

Although the report submitted by Fire-arm Expert appointed by Government can be received in evidence without calling the Expert as a witness and it can also be used as evidence in any trial, yet, so far as the rules governing the credibility or the value of the opinion of an Expert is concerned, section 510, Cr.P.C. does not make any departure from the existing state of law. It is well-settled that report of an Expert, may, he be a Ballistic Expert, is after all an opinion which can be fallible and is not immune from judicial scrutiny. The opinion of an Expert is received in evidence because it either confirms or falsifies the other evidence on record. Since the fate of this case hinges on the evidentiary value of the corroboratory evidence, therefore, there was a greater necessity for obtaining the reasons of the Ballistic Expert in support of his opinion because the weight to be attached to the Ballistic Expert report depends to considerable extent on the reasons given by, him for the conclusion arrived at. The prosecution has not produced Fire-arm Expert to support his opinion. The Trial Court did not care to call the Expert as a witness to obtain reasons for his opinion or top provide opportunity to the accused to cross-examine him. The learned trial Court should have summoned the Expert as a witness under proviso to section 510, Cr. P. C. as it was very much necessary in the interest of justice to examine him for the purpose of obtaining reasons for his) opinion.[78]

5.2 Possession of Explosive Material

5.2.1 State vs. Sadam

There was no identifiable chain of custody because of which the defendant was acquitted of a charge under Section 5 of the ATA. The judgment was appealed and it was held that because the live rounds from the fire arms were sent to the Fire Arms Expert after a delay of three days and received by the

[78] *Nawad alias Nawabi vs. The* State, 1985 PCrLJ 2217

Forensic Science Laboratory after a further delay of nine days, without any explanation, they lost their evidentiary value. There was nothing on record that showed where the live rounds were before they were sent to the Expert.

Moreover, the recovered explosive material was examined by the Bomb Disposal Unit after two months of the incident and the Expert who examined the explosive material was never examined by the prosecution. This created a serious dent in the case of the prosecution which led to an acquittal.[79]

5.3 Kidnapping

5.3.1 Azeem Khan vs. Mujahid Khan

The cell phone data that was collected in this case could not advance the case of the prosecution for the following reasons:

(i) There was no competent witness produced by the prosecution that could prove the call data

(ii) No voice record transcripts had been brought on record

(iii) There was no evidence of where the calls were being made from

(iv) There was no conclusive proof that the cell phone was owned by the accused as there was nothing on record to show that the SIM allotted was in the name of the accused.

In light of the above reasons, it was held that the cell phone data was absolutely inconclusive and of no benefit to the prosecution as it could not connect the accused to the crime in any manner.[80]

5.4 Extortion

5.4.1 Saifullah alias Saifee vs. The State

A conviction under Section 7 of the ATA was set aside by the High Court on the grounds that there was a three-day delay in sending the recovered pistols to the Forensic Science Laboratory.[81]

[79] *State vs. Sadam,* 2016 PCrLJ 1815
[80] *Azeem Khan vs. Mujahid Khan*, 2016 SCMR 274
[81] *Saifullah alias Saifee vs. The State,* 2017 YLRN 182

Activity (5.0)

- Identify common procedural flaws that undermine the admissibility and reliability of forensic evidence.

Summary

A plethora of case law regarding forensic evidence is testament to the fact that prosecutors may face certain procedural challenges when attempting to rely on case law. Examples include but not limited to: complete failure to send a weapon of offence to the Forensic Science Laboratory for analysis; delays in sending weapon(s) of offence to the Forensic Science Laboratory; a gap in the chain of custody; forensic evidence being rendered inconclusive due to the absence of any corroborating evidence; improper handling and transportation of the weapon of offence; an improperly drafted and executed expert report.

Reflect and Review

Look through the points listed below: Are you ready to move on to the next chapter?

Ready to move on: I am satisfied that I have sufficient understanding of the principles outlined in this chapter to enable me to go on to the next chapter.

Need to revise first: There are one or two areas I am unure about and need to revise before I go on to the next chapter.

Need to study again: I found many or all of the principles outlined in this chapter very difficult and need to go over them again before I move on.

Tick a box for each topic

I can explain in detail the procedural challenges that undermine the admissibility and reliability of forensic evidence.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

If you ticked **'need to revise first'**, which sections of the chapter are you going to revise?

5.1. Murder

☐ Must Revise ☐ Revision Done

5.2. Possession of Explosive Material

☐ Must Revise ☐ Revision Done

5.3. Kidnapping

☐ Must Revise ☐ Revision Done

5.4. Extortion

☐ Must Revise ☐ Revision Done

Chapter 6

International Law on the Admissibility of Forensic Evidence

Contents

Introduction

This chapter serves as a juxtapose for you in terms of the law governing forensic evidence in international jurisdictions and domestic law that you covered in the previous chapter. In this chapter, you will familiarize yourself with the law of the United States of America, the United Kingdom, Australia and India. The chapter also includes case studies regarding the use of forensic science and evidence in the United Kingdom and India.

Learning Outcomes

By the end of this Chapter and the relevant readings you should be able to:

- Identify the tests utilized by international jurisdictions pertaining to the admissibility of forensic evidence
- Draw a comparison between the principles that govern forensic evidence in Pakistan and those applicable in International jurisdictions
- Explain the importance given to forensic evidence in judicial proceedings, in particular, counter-terrorism cases by International jurisdictions.

Essential Reading

- DNA Technology in Administration of Justice by Jyotirmoy Adhikary
- Admitting Scientific Expert Evidence in the UK: Reliability Challenges and the Need for Revised Criteria – Proposing An Abridged Daubert by Jane Ireland and John Beaumont
- Halsbury's Laws of India Volume 18: Evidence.
- Indian Evidence Act, 1872
- Federal Rules of Evidence
- United States vs. Frye, 293 F 1013 (DC Cir 1923)
- Daubert vs. Merrell Dow Pharmaceuticals, 113 S Ct 2786 (1993)
- Queen vs. Bonython, (1984) 38 SASR 45
- Gajraj vs. The State, 2012(1) R.A.J. 28
- Mohammed Ajmal, Mohammad Amir Kasab vs. State of Maharashtra, (2012) 9 SCC 1

Recommended Reading

- R vs. George, EWCA Crim 2722
- The Maguire Seven Case: R vs. Maguire and others, 1991 Crim. App. R. 133.
- Bal Krishna Das vs. Radha Devi, AIR 1989 All 133
- State of Himachal Pradesh vs. Jai Lal, AIR 1999 SC 3318
- Mahmood vs. State of U.P., AIR 1976 SC 69W
- S. Gopal Reddy vs. State of Andhra Pradesh, AIR 1996 SC 2184
- Fakhrudiin vs. State of Madhya Pradesh, AIR 1967 SC 1326
- Tulsiram Kannu vs. The State, AIR 1954 SC 1
- State of Andhra Pradesh vs. Gangula Satya Murthy, AIR 1997 SC 1588

6.1 United States of America

In the United States of America, there are two main tests for the admissibility of scientific information from experts; namely the Frye test laid down in *United States vs. Frye* and the 'helpfulness' standard found in the Federal Rules of Evidence.

In *United States vs. Frye*[82], the Court ruled against the admissibility of a lie detector evidence in a murder case because the technology had not been accepted in the scientific community. As per the judgment:

> *Just when a scientific principle or discovery crosses the line between experimental and demonstrable stages is difficult to define. Somewhere in the twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.*

According to the Frye standard, 'general acceptance' is determined by identifying the particular fields into which the scientific principle or discovery falls and whether the community belonging to that field accepts the technology, principle or discovery. Therefore, admissibility depends on the quality of the forensic science which is to be determined by scientists.[83]

The Federal Rules of Evidence have provided a wider test for admissibility of forensic evidence. As per Rule 702, which concerns admissibility:

> *If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.*

In the case of *Daubert vs. Merrell Dow Pharmaceutical Inc*[84] it was held that the Frye rule was superseded by the Federal Rules. The case established four indicative tests for reliability of forensic evidence:

(i) whether scientific evidence can be or has been tested

[82] *United States vs. Frye*, 293 F 1013 (DC Cir 1923)

[83] Jyotirmoy Adhikary, *DNA Technology in Administration Of Justice* (LexisNexis Butterworths 2007), 54.

[84] *Daubert vs. Merrell Dow Pharmaceuticals, Inc.* 113 S Ct 2786 (1993)

(ii) whether the theory or technique has been peer-reviewed and subjected to publications as a means of increasing the likelihood of detecting flaws in methodology

(iii) the known or potential rate of error and the existence and maintenance of standards controlling the technique's operation; and

(iv) whether a technique has gained general acceptance within the scientific community.[85]

Self-Assessment Questions

- What is the test laid down in United States vs. Frye?
- Explain the helpfulness test applicable in the United States of America.

6.2 United Kingdom

Scientific evidence in the United Kingdom falls under the broad category of opinion evidence. It is admitted on the grounds that it meets the 'helpfulness' test. Once it is decided that the evidence is helpful, the next question is its reliability. The Courts in UK have adopted a liberal approach vis-a-vis the admissibility of forensic evidence. This was illustrated in the case of *R vs. George*[86] where a single microscopic particle of gunshot residue and a single fiber on the alleged perpetrator's clothing, linked him to the murder of a TV presenter. After seven years, the man was acquitted when it was argued that the residue could have been transferred from armed officers at the scene and through a mannequin that the defendant's clothing was placed on when taking forensic photographs.[87]

It has been argued that the English legal system has not considered reliability in much detail. The question of how to determine reliability of evidence is shrouded in mystery. The problem, as argued, is the lack of criteria for ascertaining the reliability of scientific evidence. The Law Commission made recommendations in its 2011 report to create a Statutory Reliability Test for expert evidence however this was not accepted. Therefore, there is no real

[85] Jyotirmoy Adhikary, *DNA Technology in Administration Of Justice* (LexisNexis Butterworths 2007), 59.

[86] *R vs. George*, 2007 **EWCA Crim 2722**

[87] Jane Ireland and John Beaumont, 'Admitting Scientific Expert Evidence In The UK: Reliability Challenges and the Need for Revised Criteria – Proposing An Abridged Daubert' (2015) 17 The Journal of Forensic Practice, 5.

guidance with regard to the reliability of forensic evidence. The idea behind the lack of a lucid test for reliability is to ensure that there is no inhibition on the admissibility of expert evidence.[88]

Activity (6.2)

Read the following case study, The Maguire Seven[89] and briefly highlight how forensic evidence is applied in UK cases.

It must be understood that forensic evidence is not necessarily an open and shut case. There may be misguided views about how a substance came to be present in the first place, or the nature of that substance, or the extent to which it meets the requisite standard of proof. On matters such as these there can be genuine disagreement between forensic scientists.

A court may benefit from the opinions of experts when interpreting forensic evidence. However, prosecutors must simultaneously be aware of the very real risk that the very interpretation of forensic evidence that they wish to rely on may be controversial amongst experts. Accordingly, it is important for the courts to have the benefit of opinions which admit to the margin of appreciation within which these opinions may be fairly asserted. Relevant illustrations may be taken from the Maguire case.[90]

In 1976 the accused (the Maguire Seven) were convicted of explosives offences which had occurred in 1974. Bombings had taken place in Guildford and Woolwich. The Police had found no evidence of bomb-making, but they took swabs from under the fingernails of the family. Using later discredited forensic tests they said the family had handled the explosive nitroglycerine.

Seven people were jailed. In 1991 the Court of Appeal quashed their convictions after it ruled the evidence was unsafe.[91]

[88] Jane Ireland and John Beaumont, 'Admitting Scientific Expert Evidence In The UK: Reliability Challenges and the Need for Revised Criteria – Proposing An Abridged Daubert' (2015) 17 The Journal of Forensic Practice, 6.

[89] *R vs. Maguire and others,* 1991 **Crim. App. R. 133.**

[90] See *R. vs. Maguire*, 1976 The Times 5 March p. 1; R. Kee, op. cit.; (1977) The Times 28 June; [1992] Q.B. 936.

[91] Richard Holt, 'Maguire Seven: Fighting For Freedom From Wrongful Conviction' (*Telegraph.co.uk*, 2018)

<http://www.telegraph.co.uk/news/uknews/crime/7644369/Maguire-Seven-Fighting-for-freedom-from-wrongful-conviction.html> accessed 26 January 2018.

In Maguire, the essence of the prosecution's case was that the defendants had knowingly handled nitro-glycerine (NG) for an unlawful purpose. This charge not only required scientific evidence of a positive tracing consistent with the presence of NG on each of the defendant's body or clothing but also that the trace could not be excused as innocent contamination or as attributable to the presence of some other substance which mimics the chemical make-up of NG. It was on the issue of innocent contamination that the convictions were eventually set aside.

On the issue of contamination, the prosecution's contention at the trial in 1975 was that traces of NG had been discovered underneath the fingernails of most of the defendants. This presence in such a shielded part of the body could only arise, it was said, from substantial, direct and intentional contact with NG, such as by shaping or kneading it or by inserting a detonator. Although that contention was sustained at trial and was a major factor in securing a conviction, later tests commissioned by an inquisitorial tribunal known as 'the May Inquiry' demonstrated repeatedly the brittle nature of legal extrapolation from scientific fact. The Interim May Report of 1990 drew attention to a re-investigation of the scientific evidence by a forensic specialist, Professor Thorburn Burns.

The tests were reported by the Professor and by the May Inquiry in unequivocal terms; they "demonstrated" that significant traces of NG could be picked up from a towel (such as those used communally in a bathroom) and that, having picked up traces in this way, NG readily migrates under the fingernails. This assertion was echoed by the Court of Appeal when, in 1991, it set the convictions aside solely on this ground.

In 1992, following the Court of Appeals 1991 decision, the May Inquiry released its second report. With the benefit of further tests, it was concluded that contamination with NG under the fingernails was more likely to be a product of the swabbing techniques used by the relevant authorities to take the samples to be tested rather than from a contaminated towel. Nonetheless, the May Inquiry remained convinced that, whatever its origins, contamination had been a real danger and that, in any event, the prosecution's case was improbable as a whole.

In summary, this almost dialectical process of experimentation and interpretation illustrates well the perilous interface between scientific discovery and legal proof. One important salutary lesson to be drawn is that not even an inquisitorial tribunal, with no vested interest in sustaining a conviction and with lavish resources to engage with forensic science, still found it difficult to draw appropriate conclusions. Thus, one should not assume that the answer

lies purely in resources and independence.

6.3 Australia

In the case of the *Queen vs. Bonython*[92] three factors were considered relevant in determining the admissibility of forensic evidence. These three factors are as follows:

(i) That the evidence was part of a specialized knowledge or experience

(ii) That the opinion was derived from a reliable body of knowledge or experience

(iii) The witness had the required experience to express an expert opinion

Self-Assessment Questions

- Are the factors governing admissibility of forensic evidence in Australian jurisdictions utilized by the Courts in Pakistan?

6.4 India

Scientific evidence in India is admissible under the Indian Evidence Act 1872. As per Section 45 of the Act, the opinion of a specially skilled person is relevant.[93] This broadly covers forensic evidence. An expert is defined as a person 'who by his training and experience has acquired the ability to express an opinion.'[94] The purpose of the expert opinion is simply to assist the Court in arriving at a final conclusion and it cannot form the sole basis for the conviction of an accused. Nevertheless, it was held in the Supreme Court case of *Gajraj vs. The State* that the accused can be convicted on the basis of conclusive scientific evidence.[95]

There is a growing body of case law on the admissibility and use of forensic evidence in India through expert opinion. An analysis of judicial pronouncements

[92] *Queen vs. Bonython*, (1984) 38 SASR 45

[93] Indian Evidence Act 1872, Section 45: "When the Court has to form an opinion upon a point of foreign law or of science or art or as to identity of handwriting or finger impressions, the opinions upon that point of persons specially skilled in such foreign law, science or art or in questions as to identity of handwriting or finger impressions are relevant facts. Such persons are called experts"

[94] *Bal Krishna Das vs. Radha Devi*, AIR 1989 All 133

[95] *Gajraj vs. State (NCT) of Delhi*, 2012(1) R.A.J. 28

has led to the following deductions:

(i) Experts are individuals who have made the subject upon which they speak a matter of particular study, practice or observation. The evidence of such persons who are deemed experts is of an advisory nature.

The Supreme Court of India in the case of *State of Himachal Pradesh vs. Jai Lal*[96] held that in order to bring the evidence of a witness as that of an expert it has to be shown that the expert has made a special study of the subject or has acquired special experience in that particular field. The Supreme Court went on to state that:

> *An expert is not a witness of fact. His evidence is really of an advisory character. The duty of an expert witness is to furnish the Judge with the necessary scientific criteria for testing the accuracy of the conclusions so as to enable the judge to form his independent judgment by the application of this criteria to the facts proved by the evidence of the case. The scientific opinion evidence, if intelligible, convincing and tested becomes a factor and often an important factor for consideration along with the other evidence of the case. The credibility of such a witness depends on the reasons stated in support of his conclusions and the data and materials furnished which form the basis of his conclusion.*

The Court also held that the report submitted by an expert does not go into evidence automatically and the person examined as a witness has to face cross examination for their testimony to be admissible.

(ii) It is highly unsafe to convict a person on the sole testimony of an expert.

In the case of *Mahmood vs. State of U.P*[97] the Supreme Court of India held that '...It would be highly unsafe to convict one of a capital charge without any independent corroboration, solely on the bald and dogmatic opinion of such a person, even if such opinion is assumed to be admissible under Section 45, Evidence Act.'

In light of this view, the Supreme Court held that the fingerprints of the accused on the murder weapon was shaky, suspicious and fragile evidence and was not sufficient in securing a conviction.

(iii) An expert opinion not supported by any reasons will not be relied upon.

[96] *State of Himachal Pradesh vs. Jai Lal*, AIR 1999 SC 3318
[97] *Mahmood vs. State of U.P.,* AIR 1976 SC 69W

The evidence of an expert has to be judged in the light of the probabilities and the admissions made in cross-examination and other evidence. The opinion of an expert even if free form from any infirmity is not sufficient, if there is suspicion in the manner in which the evidence has been obtained. In *S Gopal Reddy vs. State of Andhra Pradesh*,[98] the Supreme Court dilated upon this issue and held that, 'the evidence of an expert is rather weak type of evidence and the courts do not generally consider it as offering 'conclusive' proof and therefore safe to rely upon the same without seeking, independent and reliable corroboration.'

(iv) The Court may accept a fact as proved only when it has satisfied itself on its own observation that it is safe to accept the opinion of the expert or other witness.

In the case of *Fakhrudiin vs. State of Madhya Pradesh*,[99] relating to the evidence presented by the handwriting expert the Supreme Court held that expert evidence is opinion and can rarely, if ever, take the place of substantive evidence. The Court re-affirmed previously developed jurisprudence on the issue and stated that:

> *Where an expert's opinion is given, the Court must see for itself and with the assistance of the expert come to its own conclusion whether it can safely he held that the two writings are by the same person. This is not to say that the Court must play the role of an expert but to say that Court may accept that fact proved only when it has satisfied itself on its own observation that it is safe to accept the opinion whether of the expert or other witness.*

(v) Any documents purporting to be a report submitted by a scientific expert can be used as evidence in an inquiry, trial or other proceedings.

In the case of *State of Andhra Pradesh v Gangula Satya Murthy*[100] the Supreme Court convicted the appellant for murder under Section 502 and 376 of the Indian Penal Code. The conviction was based on the testimony provided by the medical expert who conducted the post-mortem examination on the body of the deceased. The medical expert concluded that the deceased had died due to strangulation but concluded his opinion subsequent to the production of report from a chemical examiner that ruled out all other possibilities of death. The

[98] *S. Gopal Reddy vs. State of Andhra Pradesh,* AIR 1996 SC 2184
[99] *Fakhrudiin vs. State of Madhya Pradesh,* AIR 1967 SC 1326
[100] *State of Andhra Pradesh vs. Gangula Satya Murthy,* AIR 1997 SC 1588

latter's report was also made available on record under Section 293 of the Code and was enabled to be used as evidence in the proceedings.

Activity (6.4)

- Identify and briefly outline the common principles governing admissibility of forensic evidence in India and Pakistan.

Summary

- The United States of America: The two main tests for the admissibility of scientific information from experts are the 'Frye test' established in the case of *United States vs. Frye* and the 'helpfulness' standard enshrined in the Federal Rules of Evidence. Under the Frye test, admissibility of forensic evidence depends on quality of forensic science. 'The helpfulness' test stipulates that if specialized knowledge will assist the trier of fact to understand the evidence or determine a fact in issue, an expert witness will be allowed to testify.
- United Kingdom: Scientific evidence in the United Kingdom falls under the broad category of opinion evidence. It is submitted on the grounds that it meets the 'helpfulness' test.
- Australia: Three factors are of determinable value when assessing the admissibility of forensic evidence. These are: whether the evidence was part of specialized knowledge or experience; whether the opinion was derived from a reliable body of knowledge or experience; and, whether the witness had the required experience to express an expert opinion.
- India: Forensic evidence in India is admissible under Section 45 of the Indian Evidence Act of 1872 which has been further analysed in judicial proceedings. Accordingly, the evidence provided by experts is only of an advisory nature and shall not be relied upon if it is not supported by any reasons. It is imperative to note that expert opinion is only admissible if the Court is satisfied on its own observation that it is safe to accept the said opinion. Moreover, the Court shall not solely rely on testimony of the expert.

Reflect and Review

Look through the points listed below: Are you ready to move on to the next chapter?

Ready to move on: I am satisfied that I have sufficient understanding of the principles outlined in this chapter to enable me to go on to the next chapter.

Need to revise first: There are one or two areas I am unure about and need to revise before I go on to the next chapter.

Need to study again: I found many or all of the principles outlined in this chapter very difficult and need to go over them again before I move on.

Tick a box for each topic

Describe the Frye test and the helpfulness criteria employed by the United States of America.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

Explain the helpfulness criteria relied upon in United Kingdom.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

Explain the three factors regarding forensic evidence that Australian Courts rely upon.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

Describe in detail the law and principles governing forensic evidence in India.

☐ Ready to move on ☐ Need to revise first ☐ Need to study again

If you ticked **'need to revise first'**, which sections of the chapter are you going to revise?

6.1. United States of America

☐ Must Revise ☐ Revision Done

6.2. United Kingdom

☐ Must Revise ☐ Revision Done

6.3. Australia

☐ Must Revise ☐ Revision Done

6.4. India

☐ Must Revise ☐ Revision Done