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Crime Scene Investigation: The Basic Knowledge for a General Medical Practitioner

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Abstract: ***Crime scene investigation plays an important role in the criminal investigation and preferably it must be conducted by a forensic scientist or crime scene investigator. However, in India, it is most commonly investigated by a police officer. It is under the care of the state police department. Sometimes, a forensic doctor may visit the crime scene examination to help the police investigating officer. Under certain conditions, a general medical practitioner may require to visit the crime scene and collect valuable physical evidence to help the law enforcement agencies. Due to a lack of training and experience, a general medical practitioner may face difficulty and legal problems.***

Keywords: Crime scene, Forensic scientist, Physical evidence, Trace evidence, Medical practitioner

1. Introduction

In a simple way, we may define a crime scene as a place where an offence has been committed. Such an area needs to be searched thoroughly by an investigative team to find out the probative evidence of the crime. Such a scientific search of a crime scene is known as a crime scene investigation[1]. The main purpose of this is to help the legal system by establishing the possible link of the suspect, victim, witnesses, etc. to the criminal event. Proper identification of the crime scene area, retrieval, and collection of samples especially trace evidence, proper documentation, photography, etc. are very important. The method or technique may vary depending on the nature of the crime committed. For a forensic scientist, forensic pathologist, or a trained crime scene investigator it is not an issue to conduct a crime scene investigation. They have better knowledge, and experience and are better equipped with modern types of equipment. But all the time and everywhere they may not be available. In a country like India, many times a general medical practitioner may need to visit the crime scene for medico-legal investigation.

The key principle of crime scene investigation is based on the "Locard's Exchange" principle which states that when two things come into contact there is always an exchange of particles, it is up to us to detect it. This was developed by Sir Edmond Locard, a French Forensic Scientist (1877-1966). So, a crime can't be committed without leaving evidence[2]. This transfer of material may be hairs, fibers, blood stains, skin tissues, body fluids, paints, etc. These materials may be present in very small quantities which are known as trace evidence. Sometimes, soil, fire debris, and cosmetics are also included in the list of trace evidence.

Therefore, in this review article, the basic knowledge about the crime scene investigation is explained in a simple way. This knowledge will be more useful for those medical practitioners who are working in remote areas both in private and government setups.

Basic steps of crime scene investigation: [2]

A. **Barricade the scene area**: The identified area must be protected by using barricading tape. If it is not available then a simple rope or wire may also be used. This will prevent the area from entry by unwanted people.
B. **Recording of the evidence**:- This may be done by using the following different methods:-
   1) Sketching Method:-The doctor may draw a sketch of the crime scene on plain paper. This may be a rough one or a final one depending on the convenience of the doctor.
   2) Note Taking Method:- This may be done by describing the crime scene area using pen and paper. All the things present must be described by mentioning some reference point from a fixed object.
   3) Photography Method: Different photographs must be obtained from different views at vertical angles so that there must be the least image distortion. Some overview, mid-range, and close-up shots must be taken. This method is better than the previously mentioned two methods.
   4) Video Recording Method:-This technique is the superior method and very convenient for future reproduction and analysis.
   5) Taking photographs and video graphs of the crime scene is a well-established practice for the documentation of crime scenes.[3-6]

2. Evidence Searching Techniques:[5-7]

It basically depends on the type of crime and the size of the place of occurrence. Some other important factors that we must consider include the nature of the crime (suicide, homicide, or accidental), the location (indoor, outdoor, both, or any remote area like underwater or desert, etc.), and the complexity of the crime scene. Sometimes, the problem may arise when some shreds of evidence are very small or practically invisible. For convenience, we may divide the searching techniques as stated below.

1) **Strip/Parallel Search Method**: In this method search for evidence is conducted by imagining the area divided into strips. Such a method is more useful when a crime occurs in a place like a classroom where already rows are present. The walkthrough must be slow and thorough.
2) **Grid Search Method:** Here the search is conducted just like in the strip method only difference is here the two strips must be in the form of a grid. This method is convenient for a larger indoor or outdoor crime scene investigation and only two people may do it by walking through on separate strips and then will switch their strips for more accuracy.
3) **Spiral Search Method:** Here the search is done by walking through slowly in the spiral form. It may be an outward or inward search depending on whether the searcher starts from the center or peripheral. This method is more useful when the area is large with fewer obstacles. Also, two investigators can search together, one moving from the center towards the periphery and the other one vice versa.
4) **Zonal Search Method:** The area is divided into different smaller zones and different people are employed in the search work. This method is suitable both for the indoor and outdoor areas but not suitable for compact and twisted areas like lift shafts, stairs, elevators, etc.
5) **Wheel Search Method:** It is practicable only when a large crime scene area is involved and it requires many people also. The whole field is divided into different zones.
6) **Random Search:** It is the most commonly used practice as it is feasible at any given place and situation. Here no particular pattern is followed, it is carried as per the convenience of the investigator.

Collection of Physical Evidence:[4-6]

The following physical evidence may be collected:-

1) Hairs (scalp, body, or pubic hairs),
2) Blood and blood stains,
3) Body fluids such as saliva, semen, vaginal fluids, etc.
4) Fingerprint impressions,
5) Clothes, ornaments, buttons, etc.
6) Soil, paints, broken glasses, gunshot residues, etc.

Here names of commonly encountered physical evidence are given but it may depend on the nature and place of the crime. If the doctor thinks that this may be helpful in the criminal investigation, that article may be preserved.

Techniques for Physical Specimen Collection:[2,8,9,10,11]

Many pieces of physical evidence may be collected by simple methods such as picking, lifting, clipping, scraping, combing, etc. Minute evidence like buttons, zip, glass pieces, fibers, etc. can easily be picked up by using forceps. Very small fibers, dust or sand particles, pollens, etc. may be lifted by using an adhesive cello tape. Thicker dry blood stains, seminal stains, paints, etc. may be preserved by the scraping method. For liquid blood, we may soak it on a white filter paper, white gauge, or a white sterile cotton cloth piece. Air dry it at room temperature & keep it in a paper bag or box after sealing. We should not dry it directly in sunlight or heat as it may damage the sample. Before packing it, we must dry it properly otherwise the sample will be damaged due to fungus or bacterial growth.If blood stains are seen on the body surface, and if they are wet, then we can use a dry cotton swab to soak in. If the stains are dry, then rub them with a cotton swab soaked with normal saline. A clean syringe or disposable pipette is used for collecting the liquid semen sample. Then it can be transferred onto a clean Swab or cotton cloth by absorption technique. If a semen-like substance is found on the cloths like panties, bras, etc., the whole cloth is collected.

Preservation Techniques: [2, 8, 11]

In many cases, the use of preservatives may not be required. Even many of the biological samples may be simply preserved by air drying. For fluid blood also we can preserve it after soaking it on a dry cloth or tissue paper. If available EDTA preservative may be used for fluid blood. A saturated solution of common salt may be used for the preservation of viscera. If DNA analysis may be required later on then the tissue must be preserved by freezing it, for short preservation up to 48 hours we can use an ice box.

Packaging & Labelling: [2, 8, 11]

It depends on the type, size, and amount of the sample collected. In many cases,a glass or plastic container preferably with a stainless steel lid may be used. For blood and other body fluid, we must use a paper envelope or bag, a polythene bag must be avoided as it doesn't absorb moisture. Every container must be sealed after complete labeling. A label must at least have the sample number, name of the content, police reference number, name of the police station, name of the accused or victim, name & signature of the doctor, date & place. Thus prepared physical evidence must be kept under lock and key till handed over to the police investigating officer.

3. Conclusions

A general medical practitioner must know the basic idea of crime scene investigation. He must be familiar with the process of crime scene investigation. . Failure to collect or destroy after collection of such evidence is a punishable offence as per Sec.201, IPC.

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