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1. Learning Outcomes

After studying this module, you shall be able to know-

- About how to reconstruct the crime scene
- The various equipments needed for crime scene photography and also about the plan of action at the scene of crime
- We will also learn about photographing specific crime scene and how to approach specific crime scene

2. Introduction

The Crime Scene is the area, where a crime namely theft, robbery, loot or murder has taken place and from which majority of the physical evidence associated with the crime is obtained. It is concerned with the photographic documentation of evidence, crime scenes and autopsies for investigation and presentation of an argument in a court of law. It provides investigators with an initial point for the enquiry to define the characteristics of the questionable and victim. Primary scene and various sites have to be thoroughly examined for the purpose.

The main thrust will be finding of some trace evidence at each scene of crime that relates to suspect with the victim. A Crime Scene Photographer must be able to identify the target areas where probable evidence is located and suitably capture those areas by using various photographic techniques so that they are presentable in the court of law.

3. Reconstructing the crime scene

After the initial walk-through or survey of the crime scene, the investigator should mentally formulate a hypothesis of the crime, focusing on the likely sequence of events and the locations and positions of everyone present during the crime. Information like the following may be critical in determining the truthfulness of a suspect or the reliability of a witness:

- Shoeprints may reveal a perpetrator's every step.
- Fingerprints may indicate the things the perpetrator touched.
- Tool marks may signify points of entry/exit or where safes or locked cabinets are tried open.

- Blood spatters, bullet trajectories, the angle and severity of blows and stabs, and the nature of the victim's injuries can reveal the actual and relative positions of the assailant, victim, and anyone else who was present during a crime.
- The physical changes that take place in a corpse may indicate whether the body was moved several hours after death.

The investigator should look at each piece of physical evidence to find out whether it supports this theory, considering information obtained not only at the scene but also from the crime lab, medical reports of anyone who was injured, and the medical examiner's autopsy examination. Anything that doesn't fit in with or justify the investigator's theory of the crime must be reconciled; otherwise, the theory must change. As a result, the reconstruction of a crime scene is constantly evolving as more evidence is uncovered.

The investigator or the team repeatedly tests the increasing crime theory in contradiction of the evidence and do not makes any assumptions although they have relevancy. An investigator may logically believe that a piece of evidence ended up where it did because of a suspect's actions, but if the hard evidence doesn't support this belief, the theory must be held suspect.

If a gun is found just outside the rear door of a house where a homicide took place, logic suggests that the assailant dropped the gun while escaping. Although that's certainly a possibility, without solid evidence, ruling out other possibilities may be difficult. For all investigators know, the gun had been tossed there in an attempt to make a domestic homicide look like a murder committed by a burglar whom the victim supposedly caught in the act. Evidence like the spouse's fingerprints on the gun or the victim's blood on the spouse's shoes may, of course, change the theory, but until all evidence in a reconstruction is considered and explained, investigators can't reach any absolute conclusions.

4. Equipments for Crime Scene Photography



Crime Scene Photography Kit

The following items should be available to the crime scene photographer in order to photograph most scenes and evidence:

- **Camera**

Crime scene photographers should use a high quality digital camera preferably a SLR camera. It has at least ten megapixel and manual exposure sites (and various custom settings in the field of ISO or sensitivity, focusing zone, exposure modes, bracketing modes, white balance, delay timer, mirror lock, radio trigger, step aperture & shutter speed etc. are usually suitable for crime scene and evidence photography. The body of the camera should be sturdy and water resistant since the field of crime scene is always vulnerable to variable situation and needs immediate action for collection of evidence.

- **Normal lens**

A normal lens provides the best perspective for most photographs. A 50mm lens is considered a normal lens for a 35mm format SLR camera.

- **Wide-angle lens**

A wide-angle lens is required for taking pictures in small rooms or other compact areas. A 28 to 35 mm lens is considered a wide-angle lens for a 35mm camera. Recent practice is to use a wide angle zoom from 18 to 35 mm.

- **Close-up lens or close-up accessories**

Most normal lenses do not focus closer than about three feet. A macro lens or a close-up accessory for the normal lens is needed to photograph small items of evidence. Close-up accessories include 1:1 adapters, extension tubes, bellows, reversing rings, or close-up filters. Although scale is used, sometimes real size images of small size evidence are required.

- **Filters**

A polarizing filter is often really required for photographing through glass and into water. Colored filters (red, orange, yellow, blue, and green) are used for taking pictures of several evidences by black-and-white film.

- **Electronic flash**

Electronic flash, especially with TTL exposure measurement provides additional light that is often needed when photographing indoors, outdoors at night, filling in shadows in bright daylight scenes and for lighting evidence.

- **Remote sync cord for electronic flash/ Radio Trigger**

A remote sync cord allows the electronic flash to be operated when it is not mounted on camera. Many photographs, especially photographs of certain types of evidence, cannot be photographed with the flash mounted on the camera. Now it is possible to operate remotely located or unconnected flash through the camera with the help of a radio trigger which are required to illuminate a large area at night.

- **Additional camera and electric flash series**

Batteries can pass away deprived of cautioning at the time of documentation of a scene. For both the camera and electronic flash, additional batteries should be carried.

- **Tripod**

Sturdy and lightweight tripods are necessary to make the camera rest on a stationary location for long exposures and for positioning the camera during certain types of evidence photography.

- **Digital Storage Card**

Adequate memory cards of suitable formats for the camera used with faster reading and writing capability. Mirror copy of cards to be kept before giving it to someone without disturbing the original card. It is important to make redundant copy of images without disturbing the metadata.

- **Photo log, notebook and pen**

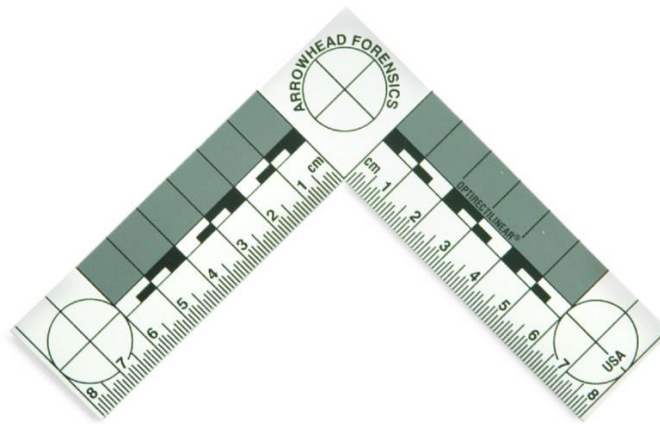
A photo log is necessary for recording information about each photograph taken at a crime scene. The notebook should be carried for recording various notes regarding crime scene.

- **Scales and tape measure**

Different scales, containing 6 inch and 36 inch sizes should be taken for snapping diverse kinds of objects. Long tape measures with large numbers are occasionally needed when taking pictures of large objects of evidence or large spaces in a crime scene.

- **ABFO #2 scale**

The ABFO #2 scale is the preferred scale for photographing injuries. This is an extremely essential item which judges the actual size of the evidence by seeing the image/ photograph.



- **Angle-finder**

An angle finder is used to help position a camera for photographing certain types of evidence at the crime scene.

- **Color chart or color control patches**

Color chart or color control coverings are valuable for color mentioning the injury photography.

- **18% gray card**

A 18% gray card is used as an aid in getting accurate exposures.

- **Index cards and felt pen**

An identifier is essential in a picture; we can give a number or identifier on an index card and place it in the photograph.

- **Flashlight**

A flashlight is helpful to observe in dark areas. By shining the light on evidence from different angles you can see where it is best to position the electronic flash for a photograph.



5. Plan of Action in Crime Scene

The main course of action includes:-

Managing a crime scene includes careful examination of the area, note taking, sketching, photography and collection of physical evidence. The crime scene must be approached in a methodical way and certain steps must be performed before others

There are basically 12 steps involved with the organization in a crime scene search operation-

1. **Preparation**
2. **Approach**
3. **Secure and protect Scene of Crime**
4. **Initiate preliminary survey**
5. **Evaluate physical evidence possibilities**
6. **Prepare a narrative description**

7. **Depict the Scene of Crime Photographically**
8. **Prepare Diagram/Sketch of Scene**
9. **Conduct a detailed search**
10. **Record and collect physical evidence**
11. **Conduct final survey**
12. **Release the Scene of Crime**

SCENE OF CRIME PHOTOGRAPHY

- ❖ The well-known phrase “one picture is worth a thousand words” certainly holds true with crime scene photography. Sciences in crime investigation could not be carried on without Photography.
- ❖ Out of all the sciences used for Forensic investigation, photography plays a vital role and is a visual means of communication.

Photographs constitute the single most important form of demonstrative evidence used in Court of Law

- ✓ Before any items are moved or even touched, the crime scene should be photographed.
- ✓ The photographs should be taken to clearly and accurately depict the scene as it was found.
- ✓ The paths taken by the criminal to the scene, the point of entry, the exit, and the escape route.
- ✓ Detailed photographs should be taken to show items of physical evidence in the condition in which they were found by the investigator prior to their removal

Following items of Scene of Crime should be photographed

- ✓ The main site of the Scene.
- ✓ The route of approach of the Scene.
- ✓ The point of the entrance.
- ✓ The location and position of the Scene.

- ✓ The evidence (injuries, weapon, hair/fibers)
- ✓ Evidence left by criminals (weapon, Bullets).
- ✓ The point of Exit and route of departure.

Admissibility of photographic evidence

1. *Three major points of qualification of a photograph in court*

- a. Object pictured must be material or relevant to the point in issue
- b. The photograph must not appeal to the emotions or tend to prejudice the court or jury
- c. The photograph must be free from distortion and not misrepresent the scene or the object it purports to reproduce

6. Photographing Specific Crime Scenes

Each crime scene has unique characteristics and the type of photographs needed will be determined at the scene by the investigator familiar with the crime.

Specific Crimes

Each crime scene has its own particular features, and the type of photography required at each scene will be determined by those features.

A. Homicide

Murder has been called the most heinous of crimes - the taking of another human life. It is a curse to humanity and demands swift and satisfactory resolution. It will be important to photograph any signs of activity prior to the murder; any evidence of a struggle, or of forced entry if an indoor scene; and the views from the positions any witnesses had of the crime. You will usually have to attend and photograph the ensuing autopsy, where as well as taking photographs for your own information, you may be asked by the attending pathologist to take photographs of anatomical significance for his information.

B. Suicide, other dead body calls

When attending a suicide or any other deceased for that matter, and there is some doubt as to the circumstances of the death - treat it as a homicide. If the suicide should turn out to be a murder you have covered it fully.

C. Burglaries

Photographs (residential or commercial burglaries)

- a. Exterior of building
- b. Point of entry
- c. Entrance into scene
- d. Interior views
- e. Area from which valuable articles were removed
- f. Damage to locks, safe, doors, toolmarks
- g. Articles or tools left at the scene by the suspect
- h. Trace evidence
- i. Other physical evidence

D. Assaults, injuries

Assaults and other injury crimes firstly require a general, overall photograph of the victim prior to detailed photographs of injuries. An assault victim can be photographed like a mini crime scene, with general photographs, mid-range and close-up. When photographing bruises, bites marks and other injuries close-up, use a scale to show the sizes of the injuries; photograph at 90 degrees to the injury to avoid distortion; and use a small aperture especially on curved surfaces such as an arm or finger to increase depth of field and so ensure the entire injury image is sharp.

E. TRACE EVIDENCE

Shoe and Tyre Impressions

The same principle applies as in general crime scene photography, with the photograph showing where in the scene the impressions are located. This can be indicated with a marker alongside the impression, which is left in position when the mid-range and close up photographs are taken. Of course a scale is always included in the photograph as well as an identifier with the date, location and initials thereon. It is important to keep the digital plane of the camera parallel to the surface bearing the impression. It is equally important to use an oblique light source to reveal the detail of the impression. When using flash in this way on an impression which is outdoors and in sunlight, cast a shadow across the impression to enable the flash to create a greater contrast and so reveal the detail in the impression. While a shoe impression can be photographed in one frame, a tyre impression however needs numerous frames which must overlap, and here it is important to have a measuring tape alongside the impression to show the scale and to enable the photographs to be joined if necessary.



F. BLOOD SPLASH PATTERNS

Photographs of blood splash patterns, whether they be on a floor, on a vertical surface such as a wall or even overhead on a ceiling, must be photographed with the film plane parallel to the surface bearing the stain. A scale must be included on the same plane as the surface. Of course, like any serious crime scene, general location photographs must be taken to show the positions of the blood staining at the scene.

1. Use color film/ digital media
2. Orientation photographs to show locations of bloodstain evidence at the scene
3. Close-up photographs to show detail
 - a. Use a scale on the same plane as the bloodstain
 - b. Keep the film parallel to the plane of the bloodstain
 - c. Use a low oblique light angle

- **MACRO/MICRO PHOTOGRAPHY**



Close up of a bullet hit mark



Foster & Freeman complete UV-Vis-IR fingerprint imaging workstation

Apart from 1:1 and 5:1 fingerprint photography other detailed photographs are often required of tool marks, serial numbers, pieces of jewellery and the like. The focusing of a lens so close to small objects, especially when an extension tube is used, requires the use of the smallest possible aperture in the camera lens to ensure maximum depth of field and clarity of detail of the item being photographed.

d. Specific types of fingerprint subjects

- (1) Normal, dusted prints
 - (a) Usually can be photographed with no problem
- (2) Impressions in soft substances (wax, putty, clay, adhesive tape, grease, etc.)
 - (a) Use cross lighting at an oblique angle
 - (b) Preview with flashlight lighting

(3) Porous surfaces

- (a) May need to use close to a 90 degree lighting angle
- (b) Preview with flashlight lighting

(4) Glass and mirrors

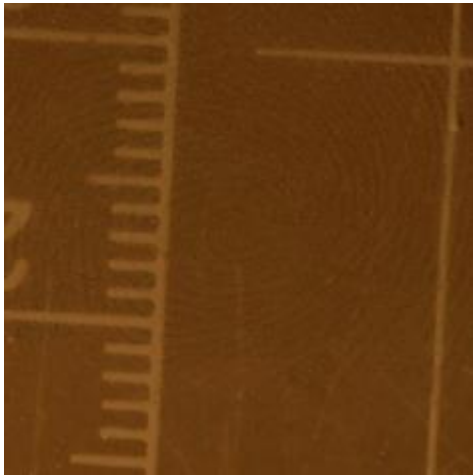
- (a) Glass -- place white card or cloth behind glass, use low oblique angle of light



Normal Light Photograph



**Photograph after PolyCyano UV
one-stage chemical staining process.**



Normal Light Photograph



Photograph by Imaging Workstation

Using a combination of 3D enhancement techniques to improve the contrast and ridge detail of a fingerprint in soft putty



ALTERNATE LIGHT SOURCES

Many lighting sources are available in forensic photography, apart from ambient daylight and electronic flash. They include infra-red, ultra-violet, laser etc. Each has its own applications and limitations. Their uses are mainly restricted to the crime laboratory, with the exception of some brands which are portable and can be taken to and used at crime scenes to reveal and enhance latent trace evidence such as fibres and body fluids. Photographing of such trace evidence requires the use of barrier filters, and descriptions of techniques and applications which are too detailed and comprehensive to report here.

Witness photograph

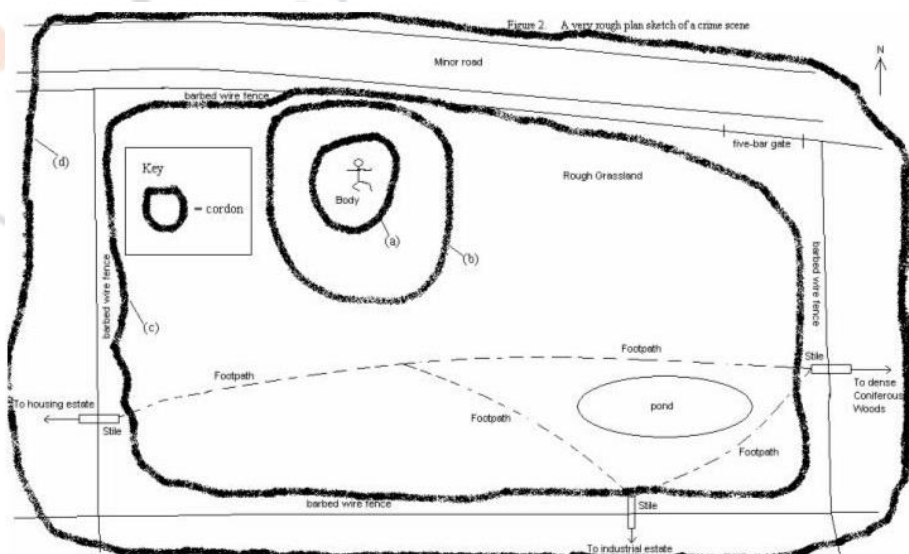
- Witness photographs are overall photos of the crime scene. They depict the scene as observed by a witness.
- These photographs are designed to tell a story, to relate what the location looked like to someone who was not present.

PHOTOGRAMMETRY

It is a science of producing 3D image from 2D object. Photography produces 2D image of 3D object. As a result of that conversion depth of object is lost. The depth of loss cannot be recovered from a single photograph. However, we can compensate this depth value by taking two differently angled photograph of the same object. By this process, a line of sight is developed. These lines, when mathematically interpolated by triangulation process, a 3 dimensional image are produced.

The xyz data is named as .dxf data, drawing interchange file format. The .dxf data when exported in user friendly CAD program, it produces a 3D image using **i-witness** & **crimezone** software.

7. Approach to the actual crime scene



ROOM OF THE CRIME WITH THE OBJECTS FOUND THERE



ADMISSIBILITY OF PHOTOGRAPHS

- Negatives are also important if enlargements of certain areas are to be made for comparison.
- Negatives demonstrate that the picture has not been altered.

VIDEOGRAPHY

- Videography has a great potential for the purpose and a video camcorder should be an instrument of choice to record the Scene of Crime.
- Images should be captured in the highest quality setting of the camera with external additional light source where the illumination is not enough.
- Large areas of the Scene can be covered showing the inter relation among the locations and relative distance with elevation.
- Results can be played back immediately. Original video cassette or the memory cards are to be submitted for evidence. Since no editing is accepted, the video suiting should be made in such a way that only relevant portions are recorded crisply.

LABORATORY PHOTOGRAPHY

- In scientific crime detection, the camera plays a paramount importance among laboratory instruments.
- Photographs provide a record of the initial appearance of evidence. A record of observation made after subjecting the evidence to scientific examination.

SKETCHING

- Sketches are handy in depicting the scene of crime
- Along with Photograph, the sketches Provide idle presentation of the scene

8. Summary

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2. After the initial walk-through or survey of the crime scene, the investigator should mentally formulate a hypothesis of the crime, focusing on the likely sequence of events and the locations and positions of everyone present during the crime.
3. Crime scene photographers should use a high quality digital camera preferably a SLR camera.
4. Out of all the sciences used for Forensic investigation, photography plays a vital role and is a visual means of communication.