BIOL 104 Forensic Biology

Chapter 2 The Crime Scene

I. Physical Evidence

* As automobiles run on gasoline, crime laboratories “run” on physical evidence.
* Physical evidence encompasses any and all objects that can establish that a crime has been committed or can provide a link between a crime and its victim or a crime and its perpetrator.
* But if physical evidence is to be used effectively for aiding the investigator, its presence first must be recognized at the crime scene.

1. The Beginning
   * Forensic science begins at the crime scene.
   * If the investigator cannot recognize physical evidence or cannot properly preserve it for laboratory examination, no amount of sophisticated laboratory instrumentation or technical expertise can salvage the situation.
   * Here, investigators must recognize and properly preserve evidence for laboratory examination.
   * It must be emphasized that the techniques of crime-scene investigation are not difficult to master and certainly lie within the bounds of comprehension of the average police officer.
2. **Locard’s Principle**

* Developed in 1910 by Edmond Locard
* States that:  
  - Criminals always take a trace of something from the crime scene with them  
  or   
  - They leave a trace of something behind at the scene of the crime.

1. Different types of evidence might be left at a crime scene.

For each piece of evidence in the list below, think of and discuss ways it could be used to provide information about a crime:

* **lipstick**
* **cloth fibers**
* **strands of hair**
* **blood**
* **shoe impressions**
* **flecks of paint**
* **tire treads**
* **fingerprints**

1. The First Steps at a Crime Scene

* The first officer to arrive at the scene is responsible for securing the crime scene.
* First priority should be given to obtaining medical assistance for individuals in need of it and to arresting the perpetrator.
* As soon as it is possible, extensive efforts must be made to exclude all unauthorized personnel from thescene.
* Once the scene is secured, the preliminary exam must begin.
* Recording of the crime scene becomes a critical piece to the investigation process.

II. Crime Scene Investigation

A. **Secure the Crime Scene**

* As a criminalist/crime scene investigator, the first things you should do upon arriving at the scene are:

1. Identify and contact the office in charge (OIC) of the scene – this is

likely to be a detective or ranking member of law enforcement present.

2. Identify all other persons who have or have had access to the scene

– this would include:

a. other law enforcement officers

b. coroner’s personnel

1. any public safety personnel (fire, ambulance, etc)
2. any civilians present (residents, neighbors, newspersons etc.)

3. Establish the scope and range of the scene –this includes:

a. physical boundaries of the scene

b. secondary scenes such as associated vehicles or relevant

sites

1. outside the physical boundaries of the scene.

4. Physically secure the scene with police line tape or by other means

and have law enforcement officers available to enforce the scene perimeter.

5. Securing the scene – this can be difficult on occasion, especially in

the case of high profile cases where news persons, and onlookers may become unruly or persistent. Also, high profile cases attract high- ranking law enforcement persons who, technically, have nothing to do with the case and have no business being on the scene.

6. Interview initial responding officers (RO’s) – this would include:

a. law enforcement officers responding to the initial call

b. backup officers who responded to the scene

7. Establish the perpetrator’s path of entry and exit – this includes

identifying any obvious pieces of evidence that come to the

attention of the crime scene investigator

8. Do an initial walk-through – this should be done along with the

initial responding officer who can add any information they may have obtained prior to your arrival

9. Develop a strategy for systematically:

a. examining/investigating the crime scene

b. documenting the crime scene investigation

B. **Record the Crime Scene** – typically, there is only so much time available

to evaluate and record the scene. The investigator must move purposefully and record the scene using a combination of methods including:

1. **Photography** – Crime scene photography is very important especially for establishing the physical relationships of items of interest (furniture, stains, weapons, bodies, etc)

“A picture is worth a thousand words”

a. Establish overall shots of the scene – this includes:

1). the entire scene

2). surrounding areas

3). points of exit and entry

b. Area shots showing the general relationship of items

c. Medium range shots showing the aspect and positioning of

items

d. Close-ups showing details of interest on the evidence items

e. Make sure to keep a running log of all photos taken

1). a written log including location, photo #, and description of the item/site photographed

2). a “photo map” using an overall sketch of the site or

localized area is also helpful for locating the item photographed and where the photo was taken from

f. Videotape – the use of videotape is being implemented on a

widespread basis in crime scene investigation recently. The advantages of videotaping include:

1). it affords an “in person” view of the scene and

evidence

2). it allows for a continuous narrative of the crime

scene investigator especially during initial walk-through and subsequent re-construction of the crime

2. **Sketches** – this is actually a very good way to make detailed

observations about a scene. A sketch of the overall crime scene noting the relative location of items along with detailed sketches and comments about various items of evidence is extremely important.

“An annotated picture is worth ten thousand words”

1. **Rough sketch** – this is made at the time of the investigation and doesn’t have to be exact or “pretty”. It does need to include:

1). an overall view including the relationship of items to

each other

2). All recovered items of physical evidence

3). All other important items of the crime scene

4). Location of objects by use of measurements

5). Identification of all items by use of identifying

numbers or letters which match with the investigator’s evidence property log.

b. **Finished Sketch** – this is made after the fact from the rough

sketch and should be neat, well-drawn with all items easily identifiable. All measurements should be as accurate as possible and should locate the item from at least two (2) landmarks (walls, doorways, fences, etc.)

3. **Detailed notes** – these are critical since often you will be asked

about the scene in court long after the investigation has taken place. Contemporaneous notes are the only way you will ever be able to accurately and truthfully be able to describe and recall events and observations

* + Note taking at the scene must be a constant activity and should include

1. **Scene** – a detailed written description of the scene with the

location of the items of physical evidence recovered. They should include:

1). time of discovery

2). who discovered it

3). how it was discovered

4). who handled the item before packaging

5). who packaged and marked the item

6). disposition of the item

b. **Details** – this may be the only record of the scene that exists

after a period of time. The note taker should put down as many details as possible at the time the notes are taken. **Only contemporaneous notes are allowed as evidence in court**.

c. **Tape recording**

1. **Conduct a Systematic Search for Evidence** – the search for physical

evidence at a crime scene must be thorough and systematic. Typically, the scene must be searched even if the solving of the crime is not at issue during the search.

1. **Search Control** – Typically, one person is put in charge of controlling the search to prevent duplication of effort or missed areas.
2. **Search Criteria** – the nature of the crime and the scene will determine what and how you search. Typically, this will differ for different crime scenes so a certain expertise must be developed by the crime scene investigator such that they recognize the scene type and can direct the search correctly.
3. **Search Strategy** – Often, the physical make-up of the scene will

determine the search strategy. There are several different search patterns that have been developed for different environments.

a. strip or line search

b. grid search

c. spiral search

d. wheel/ray search

e. quadrant or zone search

**-** differing scenes require differing search strategies. Scene types

include but are not limited to:

a. **buildings** – houses, offices, shops, stadiums, kiosks,

jails/prisons

b. **open areas** – lawns, yards, parks, parking lots, streets,

school grounds, maintenance yards, etc.

c. **vehicles** – cars, trailers, buses, airplanes, etc.

d. **persons** – victim(s), suspect(s)

4. **Search Evidence** – again, the nature of the crime will determine

what you search for. Physical evidence can be anything from massive objects to microscopic traces. Evidence collection can take place at may levels:

a. **At the crime scene** – large items and those smaller items visible by eye search and with the use of different reagents can be collected and inventoried at the scene.

b. **Trace evidence** and those items associated with

cross- transfer usually have to be evaluated back at the laboratory. These include:

1) **clothing** – including victim’s clothing and

suspect’s clothing

2**) trace evidence** collected by vacuum

sweeping the crime scene area when practical.

3**) biological evidence**– including blood, skin, saliva, semen and other body fluids.

1. **Collect and Package Physical Evidence** – physical evidence must be

handled and packaged in a way that prevents any change from occurring. The evidence must be properly packaged according to type and properly labeled and sealed with appropriate initials to maintain chain of custody. The integrity of evidence is best maintained when it is kept in its original condition as found at the crime scene. Trace evidence should not be removed from the objects it’s found on unless it is impossible to transport the item.

1. **Proper Packaging**– The crime scene investigator should bring

several different types of packaging with them to the scene. Small packages to contain hairs, fibers, bullets, glass or other items should be available typical types of small packaging include:

a. screw-cap or pressure-lid plastic bottles

b. coin envelopes/manila envelopes

c. small pill boxes

d. “druggist fold” paper bindles

– Bloodstained evidence should not be

packaged in airtight containers due to the moisture content of the blood. The blood will start to mold very quickly and this mold will damage the evidence item and the associated bloodstains. For damp or bloody items one should use:

a. brown paper bags of appropriate size

b. earth-guard bags

c. butcher paper that can be folded and properly taped shut.

2. **Proper Labeling** – Once items have been properly packaged, they

must be properly labeled. Proper labeling includes the following:

a. The investigating agency’s case number

b. the scene site (especially if more than one scene is involved)

c. a brief description of the evidence or the evidence item

number which correlates to an evidence log

1. the location where the evidence was obtained within the

scene

e. the collector’s name or badge no. and initials

f. the date and time collected

3. **Chain of Custody** – Once items have been properly packaged and

labeled, they must be transported to the crime lab for further evaluation. A complete and correct chain of custody must be maintained for all items. Often it is not the evidence collector who transports the evidence to the lab so a chain of custody log must be maintained indicating the transfer of custody to and from every individual who is involved in transporting or storing the evidence until it gets to the crime lab. These include:

a. the collecting officer

b. the transportation officer

c. any evidence storage officer if the evidence is stored prior to taking it to the lab

d. any further transportation officer

e. anyone who gets into the evidence for any reason

f. the laboratory evidence collection person(s)

1. **Crime Scene Safety** – In crime scene investigation as in all other areas of

law enforcement, the top priority item is **officer safety**. Due to changes in the social milieu, deadly, communicable diseases such as AIDS and Hepatitis are things officers can come into contact with on a frequent basis. Following proper safety guidelines is crucial for maintaining officer safety at the crime scene and beyond to the crime lab itself.

F. **Legal Considerations at the Crime Scene** –

Since the 1960’s, the Supreme Court has been defining the circumstances under which the police can search for evidence in the absence of a search warrant. A number of allowances have been made for warrantless searches (which would normally violate the 4th Amendment):

1. the existence of emergency circumstances

2. the need to prevent the immediate loss or destruction of evidence

3. a search of a person and property within the immediate control of

the person provided it is made incident to a lawful arrest (probable cause)

4. a search made by consent of the parties involved

**Two cases were decided in 1978 on these issues:**

* + ***Mincey* v. *Arizona*** – The court decided that a 4-day search following a warrantless entry in response to an officer-involved shooting was not legal and the evidence obtained which was used to convict Mincey was thrown out and the conviction was overturned.
  + ***Michigan* v. *Tyler*** – Following the burning of a building, three additional searches of the premises turned up evidence of owner-initiated arson. The court ruled that the three subsequent trips into the premises without a warrant being obtained were illegal searches and the conviction was overturned. The search of the buildings following the initial response to the fire was allowed though warrantless since it immediately followed the initial entry by firefighters.

G. Beyond The Crime Scene

* The search for physical evidence must extend beyond the crime scene to the autopsy room of a deceased victim.
* Here, the medical examiner or coroner will carefully examine the victim to establish a cause and manner of death.
* As a matter of routine, tissues and organs will be retained for pathological and toxicological examination.
* At the same time, arrangements must be made between the examiner and investigator to secure a variety of items that may be obtainable from the body for laboratory examination.
* **The following are to be collected and sent to the forensic laboratory:**

1. Victim’s clothing
2. Fingernail scrapings
3. Head and pubic hairs
4. Blood (for DNA typing purposes)
5. Vaginal, anal, and oral swabs (in sex related crimes)
6. Recovered bullets from the body
7. Hand swabs from shooting victims (for gunshot residue analysis)

**Assignment: Chapter 2 case analysis questions #1-3**