Chapter 2 Crime-Scene Investigation and Evidence Collection

By the end of this chapter you will be able to:

2.1 Summarize Locard’s Principle of Exchange.
2.2 Identify four examples of trace evidence.
2.3 Distinguish between direct and circumstantial evidence.
2.4 Identify the types of professionals who might be present at a crime scene.
2.5 Summarize the seven steps (seven S’s) of a crime-scene investigation.
Chapter 2 Crime-Scene Investigation and Evidence Collection
By the end of this chapter you will be able to:

2.6 Explain the importance of securing the crime scene.
2.7 Identify the methods by which a crime scene is documented.
2.8 Demonstrate proper technique in collecting and packaging trace evidence.
2.9 Explain what it means to map a crime scene.
2.10 Describe how evidence from a crime scene is analyzed.
Chapter 2

Vocabulary

- chain of custody
- circumstantial evidence
- class evidence
- crime-scene investigation
- crime-scene reconstruction
- datum point
- direct evidence
- first responder
- individual evidence
- paper bindle
- primary crime scene
- secondary crime scene
- trace evidence
- triangulation
Principle of Exchange

- Locard's Principle of Exchange
  - When a person comes in contact with an object or another person, a cross-transfer of physical material can occur.
  - The *intensity*, *duration*, and *nature* of the entities and contact determine the extent of the transfer.
Types of Evidence

- **Direct evidence**
  - First-hand observations

- **Circumstantial evidence**
  - Indirect evidence that can be used to imply a fact but that does not prove it
Figure 2-1 *Classification of types of evidence.*

Evidence

Direct  Circumstantial

Physical  Biological
Types of Evidence (continued)

- **Class evidence**
  - Narrows an identity to a group of persons or things

- **Individual evidence**
  - Narrows an identity to a single person or thing
The Crime-Scene Investigation Team

- Police officers
- Crime-scene investigators
- Medical examiners
- Detectives
- Specialists
The Seven S’S of Crime-Scene Investigation

1. Securing the Scene
2. Separating the Witnesses
3. Scanning the Scene
4. Seeing the Scene
5. Sketching the Scene
6. Searching for Evidence
7. Securing and Collecting Evidence
Figure 2-5 Thermal image of the alleged Boston Marathon bomber, Dzhokhar Tsarnaev, hiding in a boat just before being captured.
Packaging Evidence

- The paper bindle is ideal packaging for small, dry, trace evidence.

Figure 2-6 Demonstration of packaging of dry evidence.

a. Placement of evidence.

b. Place dried evidence on bindle paper.

c. Secure bindle in labeled evidence bag using stick-on label.

d. Write the collector’s signature across the bag’s taped edge.
Chain of Custody

Figure 2-7 Chain-of-custody procedures.

a. Original evidence bag.

b. Opened evidence bag maintaining signature on first seal.

c. Original evidence bag with uncut seal and signature, updated chain-of-custody log in a new sealed and signed evidence bag.
Grid—basically a double-line search; effective, but time-consuming

**Line or strip method**—best in large, outdoor scenes

**Quadrant or zone method**—most effective in houses or buildings; teams are assigned small zones for searching

**Spiral method**—may move inward or outward; best used where there are no physical barriers
Mapping the Outdoor Crime Scene

- Datum Points and Subdatum Points

*Figure 2-8 Establishing a crime scene.*
Mapping the Outdoor Crime Scene (continued)

- Marking Evidence Collecting Limits

Figure 2-9  Evidence collecting limits.

North

NW Corner #1  NE Corner #3

SW Corner #2  SE Corner #4
Figure 2-10 Measuring the position of evidence.
Figure 2-11  Probing a collection site for evidence belowground.
Mapping the Outdoor Crime Scene (continued)

- Measuring and Marking Evidence Positions

Figure 2-12  Establishing the location of evidence at the collection site.
*Crime Scene Sketch*

Date: August 14, 2005  
Time: 11:35 am  
Criminalist: Ann Wilson  
Location: 4358 Rockledge Dr., St. Louis, Mo.

1 inch = 5 feet

Not to scale
Analyze the Evidence

- Forensic lab technicians are specialized to process only one type of evidence.

Figure 2-13 *A modern forensics laboratory.*
Crime-Scene Reconstruction

- Crime scene reconstruction involves:
  - Forming a hypothesis of the sequence of events from before the crime was committed through its commission
  - Comparing the evidence to witnesses statements
- Investigators need to maintain an open mind as they examine all possibilities.
*Corpus Delicti
“Body of the Crime”

Authorities must prove:
  That a crime occurred
  That the person charged with the crime was responsible for the crime

Top reasons for committing a crime
  Money
  Revenge
  Emotion—love, hate, anger

Source of evidence
  Body
  Primary and/or secondary crime scene
Staged Crime Scenes

- Commonly staged types of crime scenes include:
  - Arson
  - Murder staged to look like a suicide
  - Burglary
*The Medical Examiner and the Coroner

A medical examiner is a medical doctor, usually a pathologist, and is appointed by the governing body of the area. There are 400 forensic pathologists throughout the U.S.

A coroner is an elected official who usually has no special medical training. In four states, the coroner is a medical doctor.
*Medical Examiner’s Responsibilities

Identify the deceased
Establish the time and date of death
Determine a medical cause of death (the injury or disease that resulted in the person dying)
Determine the mechanism of death (the physiological reason that the person died)
Classify the manner of death
  - Natural
  - Accidental
  - Suicide
  - Homicide
  - Undetermined
Notify the next of kin
Locard’s Principle of Exchange states that contacts between people and objects during a crime can result in a transfer of material.

Evidence may be direct, as in eyewitness accounts, or circumstantial, which does not directly support a fact.

Evidence may be physical or biological. Trace evidence is a small amount of physical or biological evidence.
A crime-scene investigation team consists of police officers, detectives, crime-scene investigators, medical examiners, and specialists.

A crime-scene investigation consists of recognizing, documenting, photographing, and collecting evidence from the crime scene.

First-responding officers must identify the extent of a crime scene, including primary and secondary scenes when possible, secure the scene(s), and segregate witnesses.
After examining the crime scene(s) and identifying evidence, the crime-scene investigators document the scene(s) with photographs and sketches.

Crime scene(s) are sometimes precisely mapped to ensure that no evidence is overlooked.

Evidence must be properly handled, collected, and labeled so that the chain of custody is maintained.

Evidence is analyzed in a forensic laboratory, and the results are provided to detectives, who develop a possible crime-scene scenario.