

A microscopic view of a DNA gel electrophoresis image, showing numerous dark, horizontal bands of varying lengths and thicknesses arranged in a grid-like pattern against a light blue background. The bands are slightly blurred, suggesting a shallow depth of field.

# Crime Scene Investigation and Evidence

# ***Crime-Scene Investigation and Evidence Collection***

**By the end of this unit you will be able to:**

- 1** Summarize Locard's Principle of Exchange.
- 2** Identify four examples of trace evidence.
- 3** Distinguish between direct and circumstantial evidence.
- 4** Summarize the seven steps (seven S's) of a crime-scene investigation.

# ***Crime-Scene Investigation and Evidence Collection***

**By the end of this unit you will be able to:**

- 5** Explain the importance of securing the crime scene.
- 6** Identify the methods by which a crime scene is documented.
- 7** Demonstrate proper technique in collecting and packaging trace evidence.
- 8** Explain what it means to map a crime scene.

# Vocabulary

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

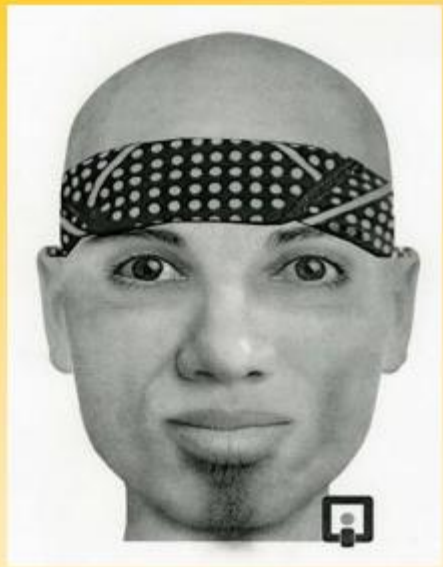
# Principle of Exchange

- 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 or Testimonial Evidence
  - First-hand observations/ statements
  - Remember problems can occur with eyewitness accounts
- Physical Evidence:
  - Indirect evidence found at a crime scene. Toolmarks, shoeprints, fingerprints, etc.
    - Generally more reliable
    - Can link suspects to crime scene
    - Can allow reconstruction of crime scene
    - Can refute or corroborate testimony





*FACES*—a composite program by InterQuest



# 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



# Transient Evidence

**Odor**—putrefaction, perfume, gasoline, urine, burning, explosives, cigarette or cigar smoke

**Temperature**—surroundings, car hood, coffee, water in a bathtub, cadaver

**Imprints and indentations**—footprints, teeth marks in perishable foods, tire marks on certain surfaces



# Pattern Evidence

- o Markings, indentations, deposits, fractures, striations.



## Examples of Conditional Evidence

**Light**—headlight, lighting conditions, lights on or off

**Smoke**—color, direction of travel, density, odor

**Fire**—color and direction of the flames, speed of spread, temperature and condition of fire

**Location**—of injuries or wounds, of bloodstains, of the victim's vehicle, of weapons or cartridge cases, of broken glass

**Vehicles**—doors locked or unlocked, windows opened or closed, radio off or on, odometer mileage

**Body**—position and types of wounds; rigor, livor, and algor mortis

**Scene**—condition of furniture, doors and windows, any disturbance or signs of a struggle

# 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
  - First responder
2. Separating the Witnesses
  - Ask questions
3. Scanning the Scene
  - Primary or Secondary location?
4. Seeing the Scene
  - Take photos
  - Triangulation

**Figure 2-10** *Measuring the position of evidence.*



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# The Seven S'S of Crime-Scene Investigation (continued)

## 5. Sketching the Scene

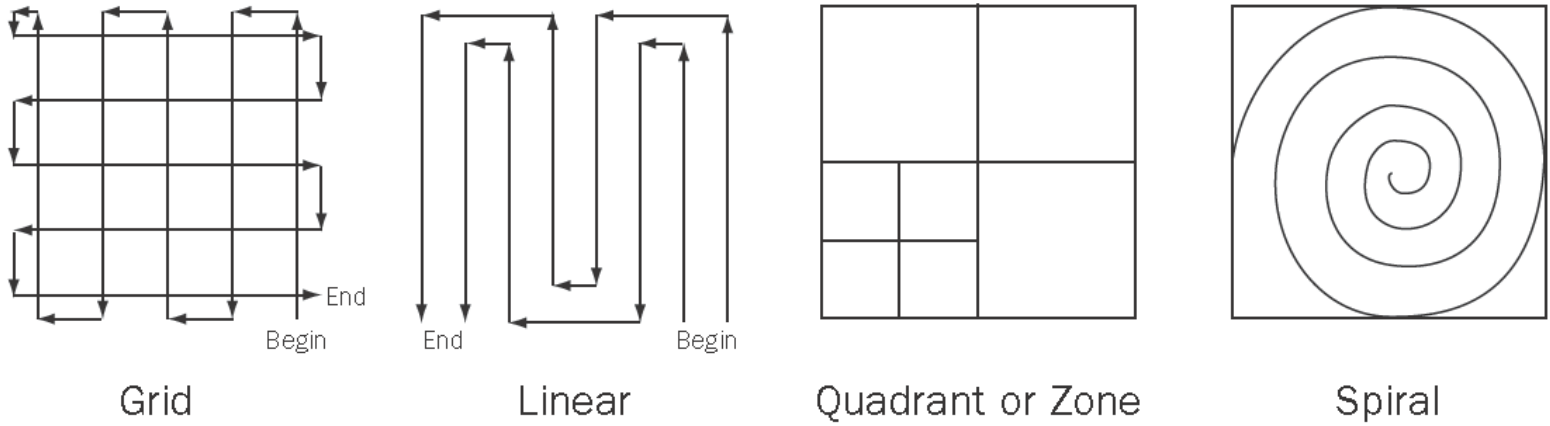
- Date, Location, SCALE, direction of North included

## 6. Searching for Evidence

## 7. Securing and Collecting Evidence

- Bindles for dried biological evidence
- Airtight unbreakable containers for liquids and arson remains
- Chain of Custody

**Figure 2-4** Four crime-scene search patterns.





**Figure 2-5** *Thermal image of the alleged Boston Marathon bomber, Dzhokhar Tsarnaev, hiding in a boat just before being captured.*

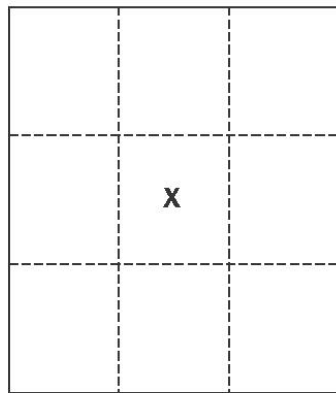


Handout/Getty Images

# Packaging Evidence

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

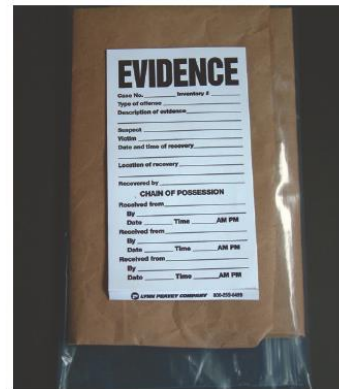
**Figure 2-6** *Demonstration of packaging of dry evidence.*



a. Placement of evidence.



b. Place dried evidence on bindle paper.



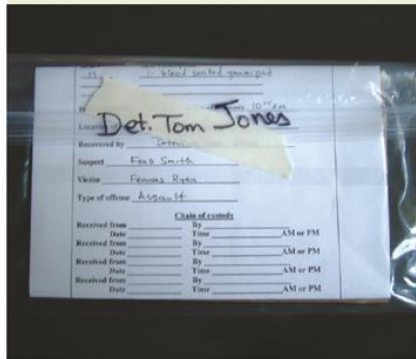
c. Secure bindle in labeled evidence bag using stick-on label.



d. Write the collector's signature across the bag's taped edge.

# Chain of Custody

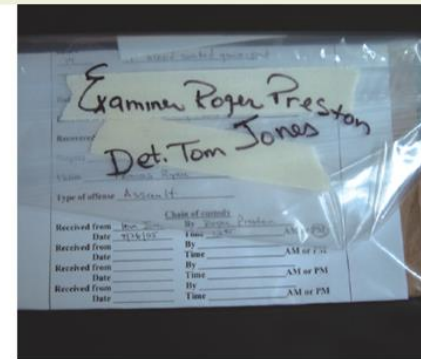
Figure 2-7 Chain-of-custody procedures.



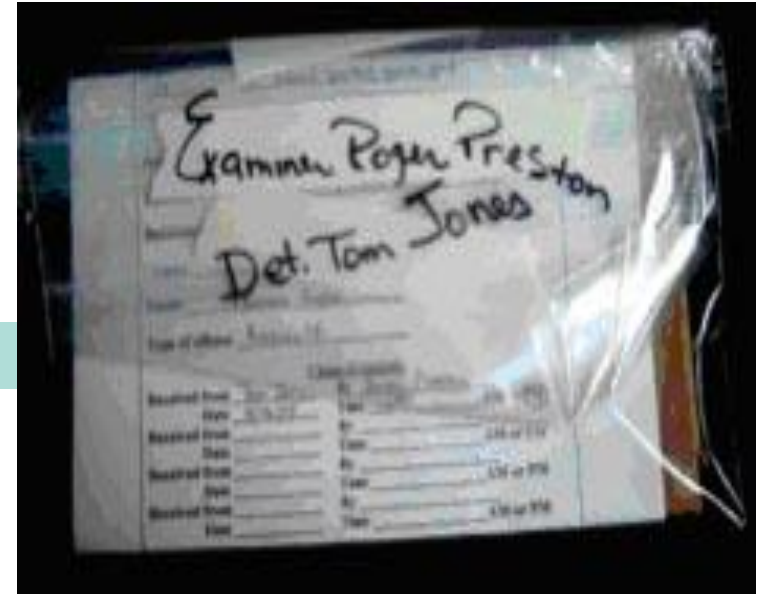
a. Original evidence bag.



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.



1. Bag the evidence  
Add identification  
Seal it  
Sign it across the sealed edge
2. Sign over to a lab technician  
Open bag on non-sealed edge
3. Return items to the evidence bag  
Seal evidence bag in another bag  
Sign the evidence log

# Mapping the Outdoor Crime Scene

- o Datum Points and Subdatum Points

**Figure 2-8** *Establishing a crime scene.*

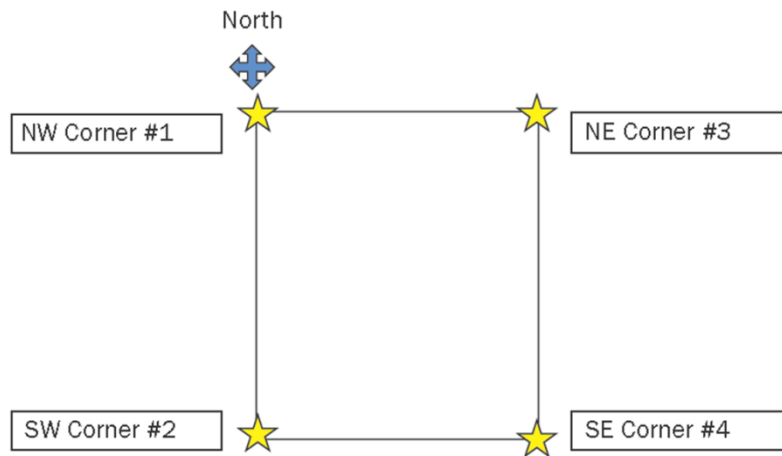


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# Mapping the Outdoor Crime Scene (continued)

- o Marking Evidence Collecting Limits

Figure 2-9 Evidence collecting limits.





**Figure 2-11** *Probing a collection site for evidence belowground.*

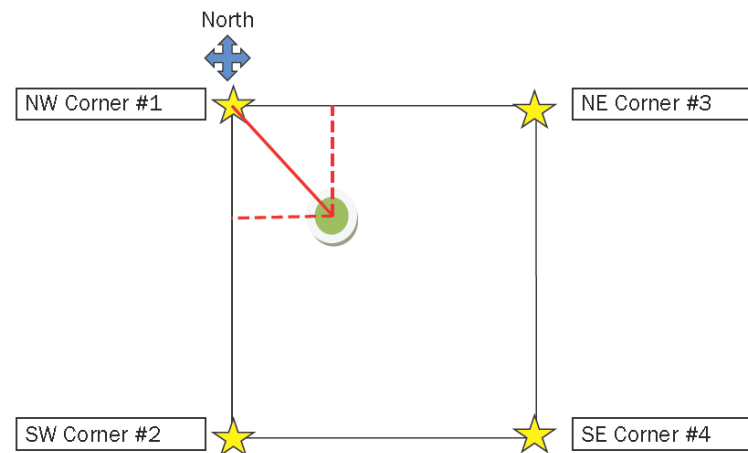


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# Mapping the Outdoor Crime Scene (continued)

- Measuring and Marking Evidence Positions

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





# Analyze the Evidence

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

**Figure 2-13** *A modern forensics laboratory.*



Dean Golja/Getty Images

# 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.

# Staged Crime Scenes

- Commonly staged types of crime scenes include:
  - Arson
  - Murder staged to look like a suicide
  - Burglary