Key Terms

Spatter: Bloodstains created from the application of force to the area where the blood originated.

Origin/Source: The place from where the blood spatter came from.

Angle of Impact: The angle at which a blood droplet strikes a surface.

Parent Drop: The droplet from which a satellite spatter originates.

Satellite Spatters: Small drops of blood that break of from the parent spatter when the blood droplet hits a surface.

Spines: The pointed edges of a stain that radiate out form the spatter; can help determine the direction from which the blood traveled.

Q: What is Blood Spatter?

- Projected blood stains = blood spatter
  - Bloodstain patterns can help investigators reconstruct events in a crime scene.
  - Analysis of the blood stain can tell whether it is animal or human.
  - Can be analyzed to determine **patterns** that give investigators clues to how a crime might have happened.

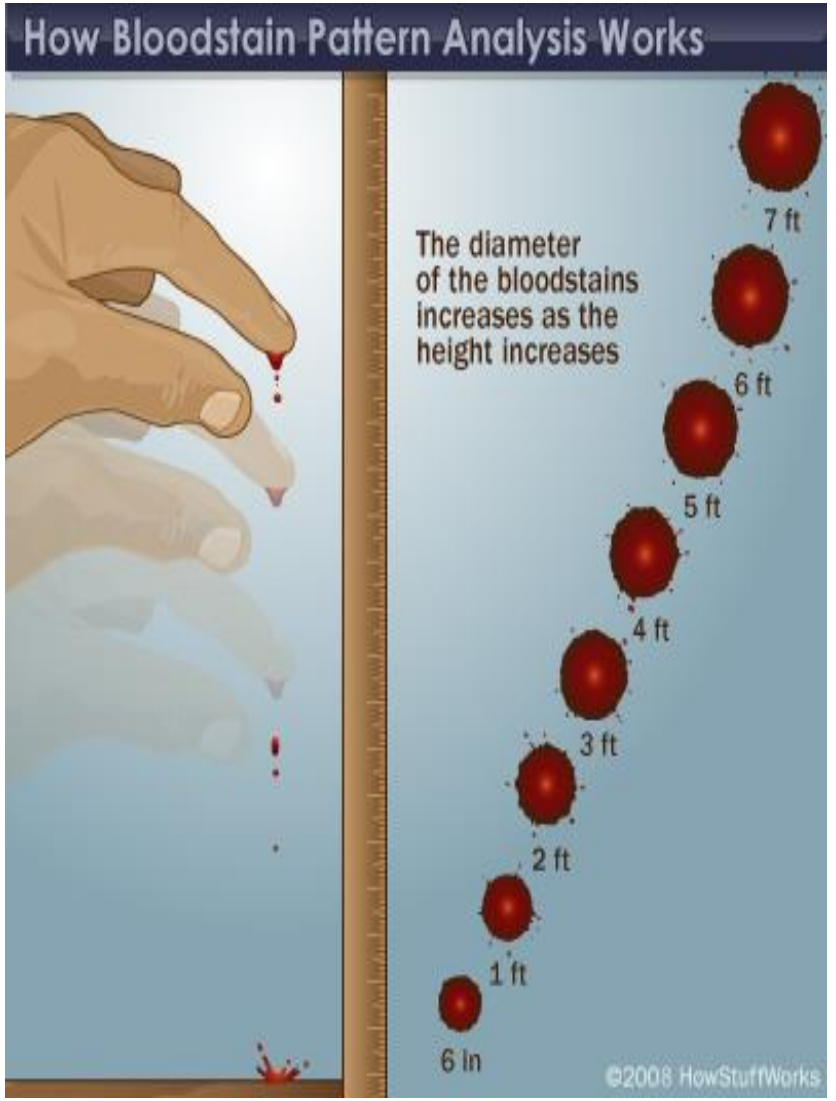
It's All Science…

- **Gravity:** pulls blood to ground
  - Droplets become longer than wider
- **Cohesion:** blood mixture is attracted to similar blood mixtures and sticks together, not separates, as it falls
  - Causes droplet to stay together
- **Adhesion:** attractive forces of two different objects
  - starts as teardrop because of adhesion
- **Surface Tension:** the elastic like property of the surface of the liquid that makes contract
  - Caused by the forces of attraction between the molecules of the liquid
  - Formation of a sphere

Q: What is Blood Spatter Analysis (BSA)?

- Blood spatter analysis (BSA) can approximate:
  - distance from the source of the blood to the pattern
  - direction from which the blood impacted
  - speed the droplet was traveling
  - location of the point of origin
  - movement of a bleeding individual throughout the scene

- After close analysis, blood spatters can indicate important information such as:
  - **Type and velocity of weapon**
  - **Number of blows**
  - **Handedness of assailant** (assailants tend to strike with their dominant hand on the opposite side of the victim's body)
  - **Position and movements of the victim and assailant during and after the attack**
  - Which wounds were inflicted first
  - Type of injuries
  - **How long ago the crime was committed**
  - Whether death was immediate or delayed



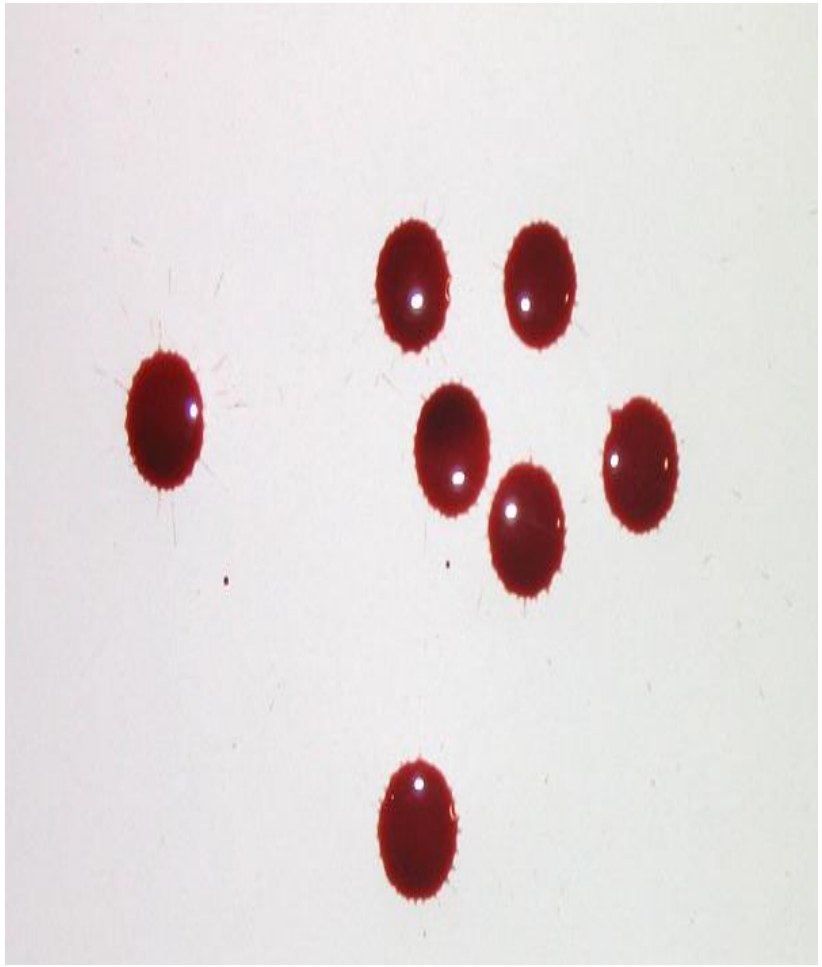
Q: What are the types of blood evidence?

- **Blood samples**
  - Can be analyzed to determine **blood type** and **DNA**, which can be matched to possible suspects.
- **Blood droplets**
  - Can be analyzed to give clues to the location of a **crime**, movement of a **victim**, and type of **weapon**

Blood Droplets

- **Flat surface:** edge of blood drop appears smooth and circular
  - Glass, marble
- **Porous surface:** edge of drop of blood may form small spikes (extensions) or satellites
  - Spikes: attached to make droplet
  - Satellites: not attached to main droplet

Blood Droplet Patterns



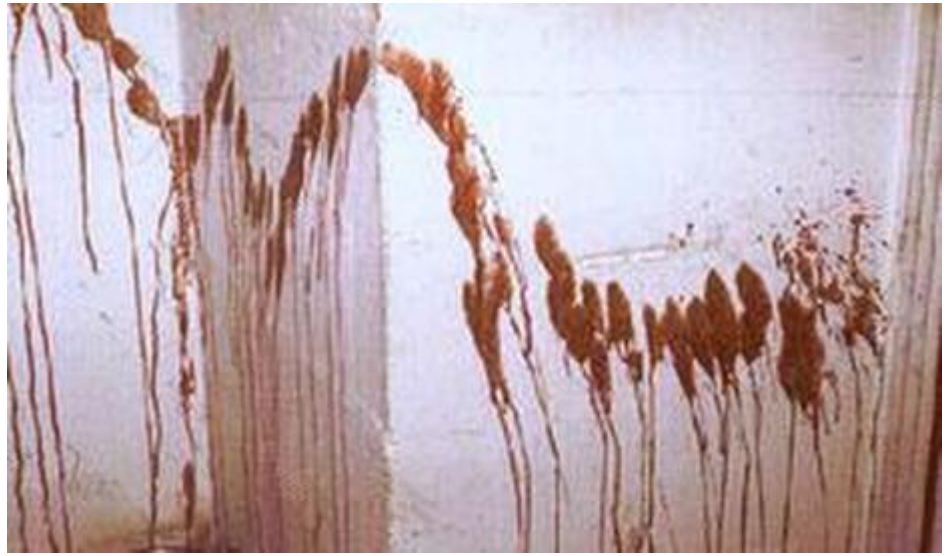
Passive Fall

- Blood falling directly to floor at 90-degree angle will produce circular drops
- Secondary satellites being more produced if surface hits is textured

Blood Droplet Patterns

Arterial spurts or gushes

- Typically found on walls or ceilings
- Caused by pumping action of the heart



Blood Droplet Patterns

Splashes

Shaped like exclamation points.

- Shape and position of spatter pattern can help locate the position of the victim time of the attack

Blood Droplet Patterns

Smears

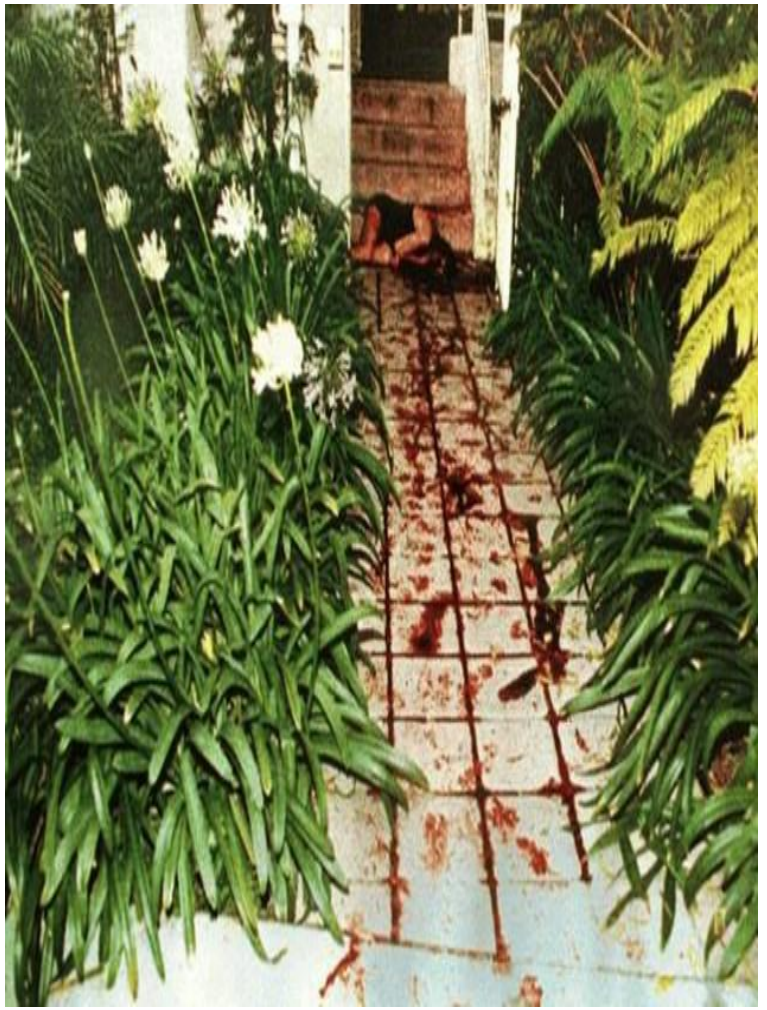
Left by bleeding victim depositing blood as he or she touches or brushes against a wall or furniture

- “Transfers”

Blood Droplet Patterns

Trails

- Can be left by bleeding victim depositing blood as he or she moves from one location to another.
- Can be round, smeared, appear as spurts



Blood Droplet Patterns

Pools: Form around victim who is bleeding heavily and remains in one place.

- If victim is moved to another location, there may be droplets or smearing connecting the first location with a second

Velocity Spatter Patterns

High Velocity Impact

- They travel more than 100 ft/sec and usually look like a fine spray of tiny droplets
- Less than 1 mm in diameter.
- Usually caused by gunshot wounds
- Can be caused by other weapons if the assailant exerts an extreme amount of force.

Velocity Spatter Patterns

Medium-Velocity Spatter

- Had a force of anywhere from 5 – 100 ft/sec,
- Diameter is usually no more than 4 mm.
- This type of spatter can be caused by a blunt object, such as a bat or an intense beating with a fist.
- Can also result from a stabbing.

Velocity Spatter Patterns

Low-Velocity Impact

- Usually the result of dripping blood.
- The force of impact is 5 ft/sec or less
- Size of the droplets is somewhere between 4-8 mm (0.16 to 0.31 inches).
- This type of blood spatter often occurs after a victim initially sustains an injury, not during the infliction of the injury itself.