use blood spatter interpretation to determine what events occurred; when and in what sequence they occurred; who was or was not present; and what did not occur.\(^2\)

Officers or crime technicians can record the measurements of the stains needed and leave it to the experts to interpret them. However, officers and technicians should have a basic idea of what the blood spatter means, including—

- an understanding of the three classifications of blood spatter velocity and what they indicate;
- how to tell which way a drop was traveling;
- how to measure the length and width of a stain;
- how to measure from the stain to the point of convergence; and
- how to properly photograph blood stains.

**VELOCITIES OF BLOOD SPATTER**

The velocity of the blood spatter when it strikes a surface is, within certain limitations, a strong and reasonably reliable indicator of the speed of the force that set the blood in motion in the first place. The classification of the velocity (whether high, medium, or low) is that of the initial force causing the blood to move, rather than the speed of the blood itself as it moves, and is measured in feet per second (fps). High velocity blood spatter, for instance, may have come from a gunshot wound inflicted by a bullet moving at 900 fps, whereas medium velocity may have resulted from a spurting artery or a blunt instrument striking the already bloody head or limb of a victim, and low velocity blood may have dripped from a wound or blood-soaked item.

**High Velocity**

High velocity blood spatter is produced by an external force greater than 100 fps. The stains, sometimes referred to as a mist, tend to be less than 1 millimeter. Usually created by gunshots or explosives, high velocity patterns also may result from industrial machinery or even expired air, such as coughing or sneezing. In any case, the spatter tends to come from tiny drops of blood propelled into the air by an explosive force. High velocity droplets travel the shortest distance because of the resistance of the air against their small mass.

**Medium Velocity**

An external force of greater than 5 fps but less than 25 fps causes medium blood spatter. The stains generally measure 1 to 3 millimeters. Blunt or sharp trauma, often
from knives, hatchets, clubs, fists, and arterial spurts, can produce such stains.

Most medium velocity stains found at crime and accident scenes form patterns created by blood flying from a body to a surface as a result of blunt or sharp trauma or the body colliding with rounded or edged surfaces. It may result from a punch, stabbing, or a series of blows or, in the case of an accident, the body striking surfaces inside or outside a vehicle. Any object that blocks the blood from falling on the surface where it would have landed, including the victim or the attacker’s body or a piece of furniture moved to stage the scene, creates a void space in the stain.

**Low Velocity**

Low velocity blood spatter is created by an external force less than 5 fps (normal gravity) with the stains generally 3 millimeters and larger. It usually results from blood dripping from a person walking or running or from a bloody weapon. Dripping blood often falls at a 90-degree angle and forms a 360-degree circumference stain when it hits a flat surface, depending, of course, on the texture of the surface. Investigators also may find low velocity blood spatter in the trail of an individual who is bleeding with larger pools of blood indicating where the person paused.

**THE BLOOD DROP IN FLIGHT**

Experiments with blood have shown that a drop of blood tends to form into a sphere, rather than a teardrop, when in flight. Fresh blood is slightly more viscous than water and, like water, tends to hold the spherical shape in flight.

This spherical shape of blood in flight is important for the calculation of the angle of impact of blood spatter when it hits a surface. That angle determines the point from which the blood originated, called the point of origin (PO).

When a drop of blood strikes a flat surface, the diameter of the drop in flight will be the same as the width of the spatter on the surface. The length of the spatter will be longer, depending on the angle at which the drop hit.

**POINT OF CONVERGENCE**

A fan-shaped blood pattern found on a floor as the result of a gunshot wound to the head can illustrate the point of convergence. When blood disperses in various directions from a wound, the blood drops tend to fan out. As the drops strike the floor, they elongate into oval shapes. An imaginary line drawn lengthwise through the middle of the oval shape will trace back to the area where the blood came from. Lines drawn through several of the blood spatters will cross at the point where the
CONCLUSION

Blood spatter analysis experts can develop important information from the patterns of blood at a crime scene. First-responding officers, crime scene technicians, and detectives can learn to photograph and preserve the measurements of blood spatter evidence at crime and accident scenes, gleaning a great deal of information without becoming experts themselves. If they properly photograph and accurately measure the length and width of the individual blood spatters and the distance from each spatter to the point of convergence, they can provide the expert analysts with data to make the necessary calculations and draw their conclusions. If agencies fail to obtain measurements and photographs, they risk losing critical information forever. Therefore, the collection of blood spatter evidence must be brought into today’s world of technological advances and treated as important, but common, crime scene evidence easily preserved by law enforcement personnel who have acquired the necessary skills with a minimum of time and effort.

Endnotes


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