

## Forensic Terminology

- Accelerant**—agent, often an ignitable liquid, that acts to initiate a fire or increase its rate of spread
- AFIS**—Automated Fingerprint Identification System
- Agar (agarose)**—multiple sugar extracted from seaweed used to make the gel that supports DNA fragments during separation
- Algor mortis**—the postmortem cooling of the body
- Allele**—one of two alternate forms of a gene occurring at a locus on homologous chromosomes
- Amylase**—an enzyme found only in salivary and pancreatic secretions
- Anagen stage**—growth period of hair
- Angle of impact**—angle formed by the direction of a blood drop and the plane of the surface it strikes
- Antemortem**—before death
- Anthropometry**—method of identification, devised by Alphonse Bertillon in the late 19<sup>th</sup> century, consisting of a set of body measurements thought to form a unique Profile; obsolete for a century, but is an important precursor of fingerprint identification.
- Aorta**—largest artery in the body
- Autoradiogram**—x-ray film image of DNA fragments or bands identified by labeled DNA molecules
- Autosome**—any of the 22 chromosomes not involved in sex determination
- Back spatter**—blood directed back toward the source of energy or force that caused the spatter; often associated with entrance gunshot wounds
- Ballistics**—branch of physics that deals with the flights of projectiles
- Base line**—method for measuring a crime scene and the evidence present; after a fixed line is identified, the items of evidence are measured from that line at right angles
- Base pair**—combination of 2 nucleotides (A and T or G and C) held together by weak hydrogen bonds; the DNA double helix is formed when a base pair of nucleotides in the DNA strands are connected by these bonds
- Bite marks**—usually horseshoe-shaped pattern left in inanimate objects or the pattern injury left in the tissue of a victim
- Bloodstain**—transfer resulting when liquid blood comes into contact with a surface
- Blow flies**—large metallic looking flies often attracted to a dead body immediately after death
- Castoff pattern**—bloodstain pattern created when blood is released or thrown from a blood-bearing object in motion
- Cause of death**—disease or injury that initiates the lethal train of events leading to death
- Chain of custody**—the documented process the evidence goes through from the point of gathering to the final presentation in court; intended to assure that there has been no tampering or altering of the evidence
- Chromosome**—a long DNA molecule that also contains RNA and protein
- Circumstantial evidence**—a collection of facts that, when considered together, can be used to infer a conclusion about something unknown; usually a theory, supported by a significant quantity of corroborating evidence
- Clot**—gelatinous mass formed by a complex mechanism involving red blood cells, fibrinogen, platelets, and other clotting factors
- CODIS**—Combined DNA Index System; a DNA database system
- Computer crime**—a criminal act where the computer is involved; such as the introduction of a virus
- Congenital anomaly**—an abnormality, such as a spinal column defect, present at birth
- Contact wound**—a skin injury produced by a weapon in contact with or a fraction of an inch from the skin when discharged

**Control**—a test with predictable results performed with an experimental procedure to confirm the reliability of the experimental results

**Coroner**—an elected official with death investigation duties

**Corroborating evidence**—evidence that tends to support a proposition that is already supported by some evidence.

**Cortex**—the main body of hair containing protein and pigment

**Crime scene**—location of a crime; multiple crime scenes are possible for the same crime

**Criminalistics**—application of physical sciences to criminal investigation

**Cuticle**—outermost layer of hair formed by overlapping scales

**Cyanoacrylate**—important fuming method for the visualization of latent prints; also called Super Glue fuming

**Diaphysis**—shaft of a developing long bone prior to union with the ends (epiphyses)

**Direct evidence**—information that established fact, for example, an eyewitness' testimony that the defendant fired the fatal shot

**Directionality**—indicates the direction the blood was traveling when it impacted a target surface; established by the shape of the bloodstain

**Direction of travel**—trajectory or flight directionality of a blood drop that can be established by its angle of impact and directionality

**Disarticulated joint**—a joint that is no longer held together by soft tissue

**Distant wound**—firearm wound that lacks stippling, smoke, or soot; indicates a distance of 1 meter or more from the skin to the gun muzzle at time of discharge

**DMORTs**—Disaster Mortuary Operational Response Teams that process mass fatalities for the Federal Emergency Management Agency (FEMA)

**DNA band**—visual image on an autoradiogram or agarose gel showing a DNA fragment

**DNA fingerprinting**—series of techniques using the base sequence of an individual's DNA for identification purposes

**DNA sequence**—order of DNA subunits (A, T, G, and C) in a DNA molecule, e.g., ATAAGGC.....

**Drip pattern**—bloodstain pattern resulting from blood dripping into blood

**DRUGFIRE**—a database used for acquiring, storing, and analyzing images of bullets and cartridge casings

**Druggist fold**—primary or inner container used to hold evidence

**Electrophoresis**—a technique for the separation of charged molecules by migration on a support medium under the influence of an electrical charge

**Epiphyseal union**—joining of one bone growth center or epiphysis at either end of a long bone to another, commonly the diaphysis or shaft of a long bone

**Epiphysis**—bone growth centers at the ends of long bones, some flat bones, and as projecting areas (processes) connected to the main parts of bones by cartilage and eventually fusing them

**Equivocal death**—manner of death (homicide, suicide, accident) remains undetermined after a complete investigation

**Exemplar**—representative item usually in undamaged or less damaged condition to which a damaged item can be compared

**Expired blood**—blood propelled from the nose, mouth, or a wound as a result of air pressure and/or air flow

**Exsanguination**—bleeding to death

**Fibers**—common class of microscopic evidence; classified as animal, vegetable, or mineral, or natural, manufactured, or synthetic

**Forensic**—the application of scientific knowledge to legal problems

**Forensic anthropology**—application of anthropology theory and methods, primarily human skeletal biology, taphonomy, and archeological methods, to solve medicolegal problems

**Forensic archeology**—application of methods to recover human remains and interpret their related associations

**Forensic entomology**—the application of scientific study of insects to legal cases and insects associated with a dead body

**Forensic odontology**—application of the arts and sciences of dentistry to the legal system

**Forensic pathology**—a medical specialty dealing with investigating the causes of sudden and unexpected deaths

**Forensic taphonomy**—the study of the processes (as burial, decay, and preservation) that affect human remains

**Forensic toxicology**—the study of drugs and poisons that may have legal implications

**Forward spatter**—blood that travels in the same direction as the source of energy or force; often associated with exit gunshot wounds

**Friction ridge**—skin on the soles of the feet, palms of the hands, and fingers in humans and some primates that form ridges and valleys; friction ridge skin forms classifiable patterns on the end joints of fingers

**Gas chromatography**—gas flowing through a coated tube separates compounds by their size, weight, and chemical reactivity with the coating of the tube or column

**Gel**—support medium (agarose) that holds DNA molecules in place during the separation phase of electrophoresis

**Gene**—DNA passed on to descendents; it functions by specifying the creating of proteins

**Genome**—the totality of an individual's DNA or genetic material

**Graphology**—study of handwriting and how it relates to personality

**Henry system**—classification of 10-fingerprint cards so that they could be stored in large files; AFIS has rendered this system mostly obsolete

**High velocity impact spatter**—bloodstain pattern caused by a high velocity force or impact of approximately 100 feet or more per second, such as the force produced by a gunshot; the spatter is characterized by a mist-like dispersion; most mist-like droplets are usually 0.1 mm or smaller

**IBIS**—Integrated Ballistics Information System—a database used for acquiring, storing, and analyzing images of bullets and cartridge casings

**Ilium**—upper blade-like portion of the adult pelvis

**Impact site**—point on a bloody object or body that receives a blow; used interchangeably with *point of origin*

**Impact spatter**—bloodstain pattern created when blood receives a blow or force resulting in the random dispersion of smaller drops

**Incendiary fire**—fire intentionally caused by human activity

**Inference**—conclusion or deduction of a fact from the examination of other case facts, e.g., the DNA found at the crime scene allows us to infer that the defendant was at the crime scene

**Intermediate range gunshot wound**—firearm wound that shows stippling but no smoke; generally indicates a distance of a few mm to a meter from the skin to gun muzzle at the time of discharge

**Iodine fuming**—nondestructive method of visualizing latent fingerprints based on the interaction of iodine vapors with lipids in the latent residue

**Junk DNA**—the discovery that much of the DNA in every cell was repeated sequence DNA that doesn't code for proteins and led to speculation that the repeat sequence DNA had no function

**Latent print**—fingerprint that cannot be seen under normal ambient lighting; requires some type of enhancement to clarify ridge details to allow comparison and identification

**Livor mortis**—postmortem reddish discoloration of the body due to the settling of red blood cells due to gravity

**Locard's exchange principle**—according to Edmond Locard, when 2 objects contact each other, materials are transferred from one object to another; the basis for proving contact by the analysis of microscopic evidence

**Locus**—chromosomal position where a particular gene is found; the plural is *loci*

**Low velocity impact spatter**—bloodstains produced when the source is subjected to low velocity force (5 feet per second or less)

**Maggot**—fly larva prior to the maturation of the adult fly

**Mandible**—lower jaw

**Manner of death**—death occurs in one of four manners: *natural*, if caused solely by disease; *accidental*, if it occurs without apparent intent; *suicide*, if caused by the deceased; *homicide*, if someone other than the deceased caused it

**Maxilla**—upper jaw

**Mechanism of death**—abnormality produced by the cause of death which is incompatible with life

**Medical examiner**—government official, always a physician and often a forensic pathologist, charged with investigating sudden and unexpected deaths or deaths from injuries

**Medium velocity impact spatter**—bloodstains produced when a blood source has been subjected to a medium velocity force (5-25 feet per second); beating usually produces this type of spatter

**Medulla**—lengthwise central canal of a hair shaft

**Minutiae**—ending ridges, bifurcations, and dots in ridge patterns of fingerprints; the quality and quantity of these features serve as the bases of comparison and latent print identification

**Misting**—blood produced to a fine spray as the result of the application of energy or force

**Modus operandi (MO)**—method of operation of a criminal

**mtDNA**—mitochondrial DNA; the DNA found in mitochondria; inherited maternally

**Ninhydrin**—a chemical that reacts with amino acids to form a bluish-purple compound called Ruhemann's purple; widely used to visualize latent prints

**Nucleotide**—One of the structural components, or building blocks, of DNA and RNA; consists of a base (one of four chemicals: adenine, thymine, guanine, and cytosine) plus a molecule of sugar and one of phosphoric acid

**Oblique lighting**—lighting cast at angle almost parallel with an object to show detail by creating shadows

**OSHA**—Occupational Safety and Health Administration; regulates universal precautions for all types of work environments

**Ossification**—formation of bone from cartilage or other fibrous tissue

**Patent**—term used by latent print examiners to indicate visible; the opposite of latent

**Pathology**—medical specialty dealing with the diagnosis of disease by examining tissues and fluids

**PCR**—polymerase chain reaction; copying strands of target DNA in a series of cycles to produce a large number of copies of the original strands

**Perimortem**—at or around the time of death

**Plasma**—the fluid portion of blood

**Plastic**—indentation fingerprint impressed into a soft surface; has 3 dimensional character

**Point of origin**—three dimensional point or area from which the blood that produced a bloodstain originated; determined by projecting angles of impact or well-defined bloodstains back to an axis constructed through the point or area of convergence

**Point of convergence**—a point or area to which a bloodstain pattern can be projected on a two dimensional surface; determined by tracing the long axes of well-defined bloodstains within the pattern back to a common point or area

**Polymerase**—enzyme that serves as a catalyst in the formation of DNA and RNA

**Postmortem**—after death

**PPE**—personal protective equipment; such as gloves, face or eye shields, face masks, protective suits, and shoe covers that help minimize exposure to hazardous products

**Presumptive test**—a chemical test which, by production of color or light, indicates the presence of a body fluid of forensic interest (blood, semen, etc)

**Primary crime scene**—description of a crime scene based on the location of the original criminal activity; the original scene

**Projected blood pattern**—pattern created when blood is projected or released as the result of force

**Pubic symphysis**—joint formed by fibrous tissue and cartilage where the pubic bones (right and left pelvis) meet in the middle in front of the abdomen

**Pupa (pl. pupae)**—stage between the larvae and the adult in insects having a complete metamorphosis

**Pupal casings**—the covering from which adult flies emerge and leave the body

**Qualitative analysis**—determination of the identity of a substance

**Quality assurance**—guarantee of value

**Quantitative analysis**—determination of the amount of a particular substance present in a material substance

**Restriction enzyme**—endonuclease that will recognize a specific target sequence of nucleotides in DNA and break the DNA chain at that point

**Rigor mortis**—stiffening of the body after death due to the chemical breakdown of actin-myosin and the depletion of glycogen from muscles; a time dependent change that helps determine time of death

**Saliva**—oral secretion comprised of water, mucus, proteins, salts, and enzymes; functions to moisten the mouth, lubricate chewed food and aid digestion

**Satellite spatter**—small droplets of blood projected around a drop of blood upon impact with a surface

**Scallop pattern**—bloodstain produced by a single drop characterized by a wave-like, scalloped edge

**Scanning electron microscope (SEM)**—microscope that permits viewing of samples at much greater magnification and resolution than is possible by light microscopes; 10-100,000x magnification possible

**Secondary crime scene**—crime scene location after the primary crime scene

**Serum**—fluid portion of blood minus the clotting factors and formed elements; contains antibodies and other serum proteins

**Serum stain**—clear, yellowish stain with a shiny surface often appearing around a bloodstain after the blood retracts due to clotting; separation is affected by temperature, humidity, and/or air movement

**Skeleton bloodstain**—bloodstain consisting only of an outer periphery after the central area is removed by wiping when the liquid was partially dry

**Smear**—large volume of blood, usually 0.5 ml or more, that is distorted so that further classification is impossible; similar to a smudge, but produced by a larger blood volume

**Smudge**—bloodstain so distorted that no further classification is possible

**Spatter**—dispersion of small blood droplets due to the forceful projection of blood

**Spines**—pointed edge characteristics that radiate away from the center of a bloodstain; dependent on impact velocity and surface texture

**Splash**—bloodstain pattern (0.1 ml or more) created by a low velocity impact on a surface

**Stippling**—disposition of fragments of powder into the skin as the result of a gunshot wound of relatively close range; also called powder tattooing

**Striation**—fine scratch used in the microscopic comparison of bullets and tool marks; made by minute imperfections inside a gun barrel or on the surface of a tool

**Subpubic angle**—angle formed where the left and right pubic bones meet in the middle front of the body

**Swipe**—transfer of blood onto a surface not already contaminated with blood

**Taq polymerase**—polymerase that can function at very high temperatures, typically above 95 degrees Celsius; made from the thermophilic bacterium, *Thermus aquaticus*

**Target**—surface upon which blood is deposited

**Telogen phase**—dormant or resting phase of hair growth; hair in this phase is shed naturally

**Terminal velocity**—maximum speed at which a free-falling drop of blood can accelerate in air; about 25.1 feet per second

**Trace evidence**—a term used to describe any evidence small in size, such as hairs, fibers, and soil samples, that would be analyzed using a microscope

**Transfer evidence**—evidence exchanged or transferred from one location or source to another

**Transfer pattern**—contact bloodstain created when a wet, bloody surface contacts a second surface as the result of compression or lateral movement; may be recognizable

**Vitreous humor**—ocular fluid (from within the eye) that is often used as a sample for testing in postmortem toxicology

**Void**—absence of bloodstain in an otherwise continuous bloodstain pattern; may suggest an outline of the object that intercepted the blood, such as a person

**Walk-through**—preliminary crime scene survey performed to orient the crime scene investigator to the scene and the physical evidence at the scene

**Wipe**—bloodstain pattern created when an object moves through an existing bloodstain, removes blood from the existing stain, and alters its appearance