

CRIME SCENE INVESTIGATION PROCEDURES MANUAL



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1. GENERAL INFORMATION

1.1. Introduction

Response to crime scenes is the primary component of the duties of a Crime Scene Investigator (CSI). The purpose of the Crime Scene Investigation Procedures Manual is to provide a CSI with the methods and protocols needed to provide quality crime scene examination and documentation. This manual provides procedures for the work conducted by a CSI at crime scenes, post crime scene related responsibilities, or anywhere the duties of a CSI might take them. This manual is not intended to cover all situations, or to supersede Department [Standard Operating Procedures \(SOP\)](#), [Regulations](#), [Laboratory Division policies](#) and procedures, or [Physical Evidence Bulletins \(PEB\)](#).

The Crime Scene Investigation Procedures Manual shall serve as one source of information on crime scene procedures commonly encountered by Indiana State Police (ISP) CSIs. This manual is not comprehensive, and should not be considered as an all-inclusive procedure for crime scene response. The procedures set forth in this manual are to be used in conjunction with all relevant [Department regulations, rules, policies, and procedures \(SOP\)](#).

A variation from the procedures described in this manual shall be approved by a Crime Scene Investigations Supervisor prior to use. The variation used, justification, and supervisor's approval shall be documented in the [CSI's Field Guide and Notes](#). The Crime Scene Investigations Supervisor authorizing the variation shall notify the Crime Scene Investigations Section Commander of any such approvals.

1.2. Role and Function of Crime Scene Investigator

The Crime Scene Investigation Procedures Manual takes an interdisciplinary approach to providing systematic methods and procedures. CSI's duties and responsibilities in relation to criminal investigations may include some or all of the following: scene examination, scene documentation, evidence recognition, evidence collection and packaging, bloodstain pattern documentation and analysis, and shooting incident documentation and reconstruction. Indiana State Police Crime Scene Investigators document, preserve and collect evidence using controlled scientific processes that minimize the opportunity for mistakes or biases that could cause harm to an investigation.

1.3. [Crime Scene Investigator Call – Out Procedure](#)

Requests for CSI assistance at crime scenes generally come from Investigators or Troopers within the Indiana State Police, or from county, city, or local law enforcement agencies investigating crimes. Agencies may request an ISP CSI by contacting their nearest ISP District. When a CSI is needed, a systematic call-out roster has been developed in order to ensure a timely response to crime scenes. This roster designates who is the first, second, and third calls. The first call-out is the primary CSI for the county in which the request for service has been made. The second and third call-outs, if needed, progress to the appropriate Crime Scene Investigations Supervisor or the Crime Scene Investigations Section Commander who will dispatch an available CSI. A CSI may be called at any time after normal business hours, unless scheduled vacation or out of service time off has been approved. The end result provides that an available CSI always responds to a crime scene.

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- a. Each CSI is assigned a select number of counties for which they are the primary first call CSI (1st call).
- b. When a CSI is requested, contact is made with the primary CSI (1st call), based upon the county in which the request has been made.
- c. If the primary first call CSI is unable to respond, or does not reply in a reasonable time, then contact is made (2nd call) with the appropriate Crime Scene Investigations Supervisor.
- d. When a second call Crime Scene Investigations Supervisor is contacted, the Supervisor shall take responsibility for contacting a CSI.
- e. The Crime Scene Investigations Supervisor shall utilize the CSI Call-Out Roster and to contact a CSI for a timely response.
- f. If the second call Crime Scene Investigations Supervisor is unable to respond, or does not reply in a reasonable time, then contact is made (3rd call) with the Crime Scene Investigations Section Commander.
- g. When a third call Crime Scene Investigations Section Commander is contacted, the Section Commander shall take responsibility for contacting a CSI.
- h. Once a CSI is assigned, the CSI shall immediately notify the appropriate ISP District who is responding.

1.4. Initial Crime Scene Response

Once a CSI arrives at the scene, they follow the method for the examination and documentation of the crime scene known as the Crime Scene Investigation Guidelines, which is described in [ISP SOP LAB-005 “Crime Scene Investigation Guidelines – Evidence Collection and Preservation”](#).

For all crime scenes, including death investigations, crimes against persons, and property crimes, CSIs shall ensure the scene is thoroughly and completely documented by using the following procedures:

1. Establish the dimensions of the scene and identify potential hazards.
2. Establish security of the scene.
3. Plan and organize tasks and responsibilities.
4. Conduct an initial examination of the crime scene to evaluate the probative value of potential crime scene investigation activities.
5. Document and examine the crime scene.
6. Collect and preserve the evidence.
7. Conduct a final evaluation to complete a thorough investigation of the crime scene.

The scene shall be thoroughly examined and searched for potential items of evidence. It is essential to evaluate each of the examinations listed on the [ISP CSI Field Guide and Notes](#)

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2. CRIME SCENE SECURITY AND SAFETY

2.1. Introduction

The law enforcement agency requesting crime scene assistance is responsible for providing scene security. The Crime Scene Investigator (CSI) shall not begin scene examination until security has been established and maintained. All crime scenes shall be approached cautiously with initial attentiveness to safety and continued alertness to potential hazards.

2.2. Security

- 2.2.1. Prior to entering the crime scene, the legality of the search shall be confirmed with the investigator and/or prosecutor of jurisdiction.
- 2.2.2. If security of the crime scene has not been established before the arrival of the CSI, it shall be the CSI's responsibility to ensure it is established prior to conducting any scene examination.
- 2.2.3. The perimeter of the crime scene shall be secured with an appropriate barrier, such as with a crime scene barrier tape or by security personnel. The area secured should be larger than is the expected immediate area of the crime.
- 2.2.4. A crime scene log should be maintained at an established single entry control point when appropriate.

2.3. Safety

- 2.3.1. The CSI shall be aware of safety and health hazards at the crime scene and take appropriate measures to reduce the risk of exposure. Personal protective equipment (PPE) shall be considered.
- 2.3.2. PPE, germicides, and hand sanitizer may be obtained from a Regional Laboratory or the Quartermaster Section and shall be used when appropriate.
- 2.3.3. Gloves shall be worn while examining a crime scene and changed when appropriate.
- 2.3.4. Double disposable gloves shall be worn when handling infectious material or infectious material containers.
- 2.3.5. Additional PPE, such as disposable full body suits, hood, surgical mask, eye protection, and shoe covers, shall be considered and worn when appropriate.
- 2.3.6. Biohazard labels shall be affixed to all evidence containers or packaging containing potentially infectious biohazard materials.
- 2.3.7. Discard PPE into a disposable biohazard material bag. No PPE shall be left behind.

2.4. Releasing the Scene

- 2.4.1. When the scene is released by the ISP CSI, the CSI shall ensure the person it is released to is aware that potential biohazard material may still be present at the scene.
- 2.4.2. If the CSI needs to leave the scene before the examination has been completed or if there is a possibility the scene may need further examination, the CSI shall coordinate a plan with the investigator for securing the scene.

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2.4.2.1. All windows and doors shall be secured to prevent unauthorized entry.

2.4.2.2. The CSI should consider placing a tamper-evident seal and their initials on all entry doors.

2.4.2.3. A law enforcement officer shall be stationed at the scene if it cannot be secured by other means.

2.4.3. The CSI shall ensure all identified evidence has been collected, CSI equipment, crime scene tape, other materials and trash generated by the investigation are not left behind prior to leaving the crime scene.

2.4.4. The CSI should coordinate with the investigator for the proper release of the scene.

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3. EVIDENCE

3.1. Introduction

Crime scene examination requires a systematic and thorough search of the scene. It is the Crime Scene Investigator's responsibility to identify and collect, or to direct collection, of evidence. Courts require proof the evidence collected at a crime scene, or recovered by an individual, is the same evidence which was analyzed and is being presented in court. Proper packaging of evidence prevents contamination, alteration, and preserves the integrity of the evidence for court.

3.2. Procedure

- 3.2.1.** Items of evidence shall be packaged in a manner which enables a laboratory analyst to remove and reseal the item of evidence without difficulty.
- 3.2.2.** The CSI shall package evidence according to the [Physical Evidence Bulletins \(PEB\)](#). In circumstances where a PEB does not apply, they should coordinate with the Laboratory Manager.
- 3.2.3.** The chain-of-custody shall demonstrate the date, time, location, and names of who possessed the evidence.
- 3.2.4.** Evidence needing further laboratory analysis shall be packaged in an approved container, for example: paper bags, plastic bags, boxes, envelopes, metal cans, and glass vials. [Refer to PEB-20 Evidence Packaging and Submission Guidelines.](#)
- 3.2.5.** The evidence package shall be properly sealed. This means if someone is to gain access to the contents, either the package or seal will be noticeably altered. Acceptable seals are packaging tape (Mylar or reinforced packaging tape), evidence tape, or a heat seal. Staples may also be used, but only in conjunction with packing tape. Do not use masking tape, duct tape, medical tape, rubber bands, or twist ties.
- 3.2.6.** Any seal shall be identifiable to the person who sealed the item. Initials or signatures, using indelible ink, shall be across the border of the seal and the package, in such a way that it cannot be opened without obvious signs of tampering.
- 3.2.7.** At a minimum, the following information shall be included on the evidence package: item number, case number, CSI's name and PE number, date collected, a brief description of the contents, location of recovery, and ISP District number of where the case will be prosecuted. When helpful, a diagram should be included on the packaging.
- 3.2.8.** Each item shall have a unique numeric identifier. Do not duplicate item numbers within the same case.
- 3.2.9.** Do not put multiple items in one sealed package, e.g., items #1 and #2 sealed in one plastic bag. Placing multiple items in one package could cause cross contamination and unnecessary confusion.
- 3.2.10.** Consider packaging small items such as hair, fiber, paint samples, glass fragments, or latent impression lifts together, when recovered from the same location.

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- 3.2.11.** Evidence with identifying numbers (e.g., serial numbers) shall be documented with digital photography and recorded on the [Property Record and Receipt Form \(PR&R\)](#). The identifying numbers should also be recorded on other forms or notes, prior to packaging.
- 3.2.12.** Package sharp objects (e.g., knives, needles, or razor blades) in puncture resistant containers to ensure the safety of anyone handling the package.
- 3.2.13.** Firearms shall be unloaded/rendered safe before packaging and storing. “UNLOADED” shall be written on any package being submitted to a Regional Laboratory for additional analysis. Contact the Firearms Unit at a Regional Laboratory for assistance or guidance if necessary.
- 3.2.14.** Explosives or more than 1 ounce per item of ignitable material shall not be stored in evidence storage facilities. Follow the procedures in [Evidence Policy 031](#) and [PEB-05 Ignitable Liquid Residues](#) for submission of explosive evidence.
- 3.2.15.** For Taser cartridges, package each probe separately in a pill box leaving the wire leads attached. Place the two pill boxes, wires, and cartridge all together in a paper package. Do not cut the wire leads.
- 3.2.16.** Money shall be counted with a witness following the procedure in [SOP-LAB-010](#).
- 3.2.17.** Jewelry shall not be described as diamonds, emeralds, rubies, etc. Jewelry shall be described by the colors of the stones and mounting.
- 3.2.18.** When the CSI is examining a crime scene for an outside agency, all evidence shall be properly packaged, sealed, labeled, and documented on a [PR&R Form](#) prior to transferring the evidence to the outside agency. Exceptions to this policy would include when the other agency’s representative collected/removed the item themselves. In these instances, the other agency is responsible for documenting their own chain-of-custody.
- 3.2.19.** For specific recommendations on evidence packaging, refer to [Indiana State Police Standard Operating Procedures](#), [Laboratory Policies](#), and [Laboratory PEBs](#).

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4. CRIME SCENE PHOTOGRAPHY

4.1. PHOTOGRAPHY

4.1.1. Introduction

4.1.2. Photography is a means of crime scene documentation. Photographs provide a permanent record and document the locations of specific items and evidence within the context of a scene. This documentation shall be conducted with the CSI's camera issued to them by the Laboratory Division. Exceptions to this policy would include a camera failure or an exigent or emergency circumstance to document an item of evidence that could be fleeting.

4.2. Procedure

4.2.1.1. The Crime Scene Investigator (CSI) shall photograph the initial condition of the scene as found, all items of physical evidence in detail, and all related surroundings to the crime scene prior to examining the scene or evidence collection.

4.2.1.2. The CSI shall format the memory card (e.g., SD card) in the camera.

4.2.1.3. All crime scenes shall be photographed.

4.2.1.4. Crime scene photographs should depict the scene in a logical sequential manner.

4.2.1.5. The photographs shall include general overall and medium range orientation. Close-up and technical photographs shall be taken when appropriate.

4.2.1.5.1. Overall photographs show overlapping views of the general layout of the scene and where evidence is located within the entire context of the scene. The scene location should be established by identifiable landmarks.

4.2.1.5.2. Medium range photographs show evidence within its immediate surroundings and position relative to other adjacent items or evidence.

4.2.1.5.3. Close-up photographs show specific items of evidence and documenting more specific detailed patterns or impressions.

4.2.1.5.4. Technical photographs show fine, detailed information for possible comparison of pattern evidence.

4.2.1.5.4.1. Utilizing a macro-lens should be considered for technical photographs.

4.2.1.5.4.2. Technical photographs shall be taken with and without a measuring scale. The scale shall be on the same plane as the evidence with the camera back parallel to the item being photographed. The scale shall not cover any portion of the evidence.

4.2.1.5.5. When photographing an item for comparison such as a latent impression, footwear impression, or tire impression, shadows may accentuate detail and highlight impressions. Oblique lighting techniques from different angles using a detachable flash or external light source may be used to enhance contrast.

4.2.1.6. Crime scene photographs should be free of foreign items, crime scene equipment, and personnel.

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4.2.1.7. No photographic image shall be altered or deleted.

4.2.1.8. The CSI shall ensure that photographic images captured by the CSI are uploaded into Evidence.com under the proper CAD number within 30 days.

4.2.1.9. Memory cards can be cleared of images for reuse after uploading to Evidence.com

4.2.2. NIGHT PHOTOGRAPHY

4.2.2.1. Introduction

Night scenes pose a challenge because the area may be too large to be illuminated by a single flash. A proper exposure may be created by painting the area with light. This technique may effectively illuminate a large area with one exposure. Like all specialized photographic techniques, it is better to bracket a number of exposures to ensure sufficient lighting detail is obtained in the image. The use of a flashlight or other external light source may be used to illuminate the area of interest without using a camera flash.

4.2.2.2. Procedure

4.2.2.2.1. Multiple people may be required to perform this procedure. Designate a CSI as the camera operator and others to provide an external light source.

4.2.2.2.2. Place the camera on a tripod.

4.2.2.2.3. Set the camera on manual mode and focus on the subject matter.

4.2.2.2.4. Set the ISO at a low setting such as 50 and adjust as needed.

4.2.2.2.5. Place the shutter on Bulb setting or a designate time exposure.

4.2.2.2.6. Start with an f/stop setting of f/8 and adjust accordingly.

4.2.2.2.7. Determine how many external flashes will be needed to properly light up the area.

4.2.2.2.8. Ensure the flash operator does not point the flash in the direction of the camera.

4.2.2.2.9. Once an appropriate number of flashes have properly lit the area, end the exposure.

4.2.2.2.10. Repeat with other exposures until the desired results are obtained.

4.2.3. PHOTOGRAPHY OF LUMINOL

4.2.3.1. Introduction

Some crime scenes may require the use of Luminol to detect latent blood (see procedure in [Section 14.3.2](#)). The chemiluminescence may be photographed to record the reactions. The darkened environmental conditions necessary for photographing these chemiluminescence reactions are the same as viewing.

4.2.3.2. Procedure

4.2.3.2.1. This procedure generally requires two individuals, one CSI to operate the camera and another to spray the blood enhancement reagent.

4.2.3.2.2. Consider video recording also.

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- 4.2.3.2.3. Darken indoor scenes as much as possible.
- 4.2.3.2.4. Outdoor scenes should be photographed at night with as few lights illuminated as possible.
- 4.2.3.2.5. Place the camera on a tripod.
- 4.2.3.2.6. Set the camera on manual mode and focus on the subject matter.
- 4.2.3.2.7. Photograph the area prior to applying Luminol.
- 4.2.3.2.8. The camera and tripod should not be moved until sufficient photographs of a subject area have been taken.
- 4.2.3.2.9. Ensure the built-in flash is turned off and set the aperture and shutter speed to appropriate settings. In most cases, an aperture setting of approximately f8, and a shutter speed of 15 to 30 should be sufficient
- 4.2.3.2.10. Start with an ISO of 800 and adjust accordingly.
- 4.2.3.2.11. Spray the reagent.
- 4.2.3.2.12. When the chemiluminescent reaction becomes visible, begin the exposure.
- 4.2.3.2.13. Continue spraying reagent as needed throughout the exposure.
- 4.2.3.2.14. Sometime during the exposure, an external flash or flashlight may be manually fired above the area. This may provide a small amount of light to illuminate the area without overpowering the chemiluminescence. If the ceiling is high or dark, the flash may need to be bounced off an adjacent wall or object.
- 4.2.3.2.15. The chemiluminescence will start to diminish after approximately 30 seconds.

4.2.4. PHOTOGRAPHY OF IMPRESSION EVIDENCE

4.2.4.1. Introduction

In cases of fragile impressions (such as impressions in snow, dirt, or blood), it is important to photograph the impression as soon as possible to prevent loss through environmental changes or other factors. Photographs of impressions for the purpose of comparison are critical for preservation and documentation of impression evidence.

4.2.4.2. Procedure

- 4.2.4.2.1. Take overall and mid-range photographs of the impression to show scene context.
- 4.2.4.2.2. Place the camera on a tripod. Place the tripod over the impression ensuring the back of the camera is parallel to the impression.
- 4.2.4.2.3. Take close-up photographs, without scale, making sure the impression is filling the photographic frame.
- 4.2.4.2.4. Place a measuring scale(s) that runs the length and width of the impression, on the same plane as the bottom of the impression without covering it. The use of a large L-shaped scale is best. Align the scale with the edges of the viewfinder of the camera.

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- 4.2.4.2.5. To indicate the direction of lighting, place a golf tee or similar type object with the scale.
- 4.2.4.2.6. Set proper exposures on the camera. When in doubt, take bracket exposures.
- 4.2.4.2.7. Ensure proper focus. Use remote shutter release if possible.
- 4.2.4.2.8. For three-dimensional impressions, use a detachable flash held at approximately 25°, 45°, and 65° angles approximately three feet away from the impression. Take at least one photograph of the impression at each angle, repositioning the flash around the sides of the impression (between tripod legs), for a total of nine photographs of the impression.
- 4.2.4.2.9. Shade the impression if in bright sunlight.
- 4.2.4.2.10. When dealing with a lengthy tire impression, utilize a measuring tape along the length of the impression, taking overlapping photographs for at least 8 feet.

4.3. VIDEOGRAPHY

4.3.1. Introduction

Crime scene videography may be used as an additional investigative or demonstrative tool. Videography may also augment still photography by providing a portrayal of the crime scene that may give a jury a sense of being there. Crime scene videography may provide the context of the crime scene and give perspective of the entire relevant area. It may also depict the relationships between evidentiary items and the physical landmarks within the scene. It shall not replace or take precedence over still photography.

4.3.2. Procedure

- 4.3.2.1. When using crime scene videography, the following procedures shall be followed.
- 4.3.2.2. Each scene shall begin with a placard or handwritten card containing the case number, date, location, time, and CSI name. A brief audio recording of this information is also acceptable.
- 4.3.2.3. Unless circumstances dictate otherwise, audio should not be recorded during documentation. In instances where audio is required, it should be monitored for proper recording.
- 4.3.2.4. All camera movements including pans, tilts and zooms should be conducted in a slow, smooth, and deliberate manner. When panning to show an overall shot, it should be done left to right with the lens zoomed to a wide angle. Video documentation should never occur while walking.
- 4.3.2.5. Recordings may be paused and restarted. If possible, similar landmarks or items should be used as points of reference between segments.
- 4.3.2.6. Documentation of the scene should begin with a slow pan of the exterior and surrounding area from a fixed position to document landmarks, lighting, overall exterior evidence, and other investigative factors.

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- 4.3.2.7. Record video throughout the scene showing location and proximity of important items of evidence in relation to one another. Starting with the main point of entry, capture general images, proceeding to medium range images, and concluding with close-ups.
- 4.3.2.8. Though the length of the video will be dependent on the complexity of the scene, an effort shall be made to be as concise as possible.
- 4.3.2.9. Upon completion of the scene investigation, the video shall be uploaded to Evidence.com within 30 days.

4.4. REFERENCES

- 4.4.1. [SOP-LAB-008 “Photography - Accepted Procedures and Retention Requirements”](#)

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5. CRIME SCENE DIAGRAMMING

5.1 MEASUREMENT DEVICES

5.1.1. Introduction

Crime Scene Investigators (CSIs) shall be supplied with measuring devices needed for the examination and documentation of crime scenes.

5.1.2. Measurement Uncertainty

Crime scene investigations are qualitative in nature. Conclusions shall be based on training, experience, and professional judgment, which are demonstrated by competency and proficiency testing, along with administrative and technical reviews of casework. All measurements reported in crime scene investigation reports are approximate or within a range of measurements. Estimation of uncertainty of measurement will not be determined in the Crime Scene Investigations Section since all measurements are an approximation or a range. When a quantity is included in the report, it shall clearly state that the number is an approximation or a range and not a precise measurement.

5.1.3. Performance Verification

All measuring devices shall be uniquely identified and recorded as to the assigned personnel. New measuring devices shall be compared to a certified ruler prior to use at a crime scene or in casework. Certified rulers shall have certificate of calibration traceable to the National Institute of Standards and Technology (NIST). The reference standards and equipment maintained at a regional laboratory may be used.

5.1.4. Procedure

- 5.1.4.1. The following provides a brief overview of the comparison and/or performance checks.
- 5.1.4.2. Measuring devices may include rulers, retractable tapes, 100-foot tape, laser measuring device, and surveyor's wheel.
- 5.1.4.3. All measurement devices and equipment influencing the accuracy or validity of crime scene documentation shall be uniquely identified, properly maintained, and performance checked.
- 5.1.4.4. Performance checks of measurement devices shall be completed and traceable to NIST standards with reported measurement uncertainty values within plus or minus (+/-) 0.005 per foot (12 inches).
- 5.1.4.5. The Crime Scene Investigations Section Commander shall ensure new measuring devices are compared to a certified ruler prior to use at a crime scene or in casework.
- 5.1.4.6. All measurement devices shall be performance checked before being placed into service by comparison to a NIST certified ruler.

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- 5.1.4.7. All electronic measurement devices shall be performance checked annually by comparison to a NIST certified ruler.
- 5.1.4.7.1. Devices measuring in inches shall be within +/- 1/32 inch in comparison to a NIST ruler to be considered acceptable.
 - 5.1.4.7.2. Devices measuring in millimeters shall be within +/- 1 millimeter in comparison to the NIST certified ruler to be considered acceptable.
 - 5.1.4.7.3. Rolling measuring devices do not display smaller than a foot increments. For this reason, these devices shall be compared to an ISP verified tape measurer and shall be within +/- 1 foot, and shall not be a direct comparison against the NIST certified ruler.
 - 5.1.4.7.4. Any device with actual measurement outside of range stated shall immediately be taken out of service and the CSI shall notify their Crime Scene Investigations Supervisor and the Crime Scene Investigations Section Commander. The Crime Scene Investigations Section Commander shall ensure the measuring device which cannot pass a performance check is repaired and/or replaced.
- 5.1.4.8. The [Measuring Device Verification Form](#) and the [Measuring Device Verification Log](#) shall be completed for each performance check completed and upload the documentation to a network drive.
- 5.1.4.9. The appropriate Crime Scene Investigations Supervisor shall ensure that the documentation associated with the [Measuring Device Verification Log](#) is properly uploaded to network drive.
- 5.1.4.10. The guidelines set forth in the [Quality Assurance Manual](#) shall be followed.

5.1.5. References

- 5.1.5.1. [Quality Assurance Manual - Equipment Section](#)

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5.2. SKETCHING and DIAGRAMMING

5.2.1. Introduction

The crime scene sketch is typically a hand-drawn depiction of the crime scene and is part of the CSI's Field Guide and Notes. The sketch serves as an additional method to document the crime scene. The crime scene diagram may be drawn by hand or with CAD software and visually documents the setting of a crime scene as it appeared when it was discovered. It is derived from the crime scene sketch or 3D scan of the scene and typically includes the layout of the crime scene environment. Sketches and diagrams compliment photographs, clarify the appearance of the crime scene, and depict relationships between objects and evidence in the crime scene.

5.2.2. Procedure

- 5.2.2.1. Sketching shall be completed for all crime scenes. Exceptions to this requirement may include crime scenes with no physical evidence and tertiary crime scenes (i.e., autopsies) where no crime has occurred.
- 5.2.2.2. Crime scene diagramming shall be created for all death and crimes against persons scenes, to include officer-involved shootings. The CSI should consider the benefit of using a FARO scanner or other similar device for homicides or suspicious deaths. Exceptions to this are suicide, natural deaths, and non-traffic accidental death scenes when the investigative team agrees that there are no leads to follow, and the investigation shows no evidence or indications of foul play.
- 5.2.2.3. One or more of the following examples of diagrams should be used: floor plan, vertical view, exploded view, or three-dimensional.
 - 5.2.2.3.1. The floor plan diagram (i.e., bird's eye view) is easiest for laypersons to comprehend and is drawn on a horizontal plane.
 - 5.2.2.3.2. The elevation diagram portrays evidence on a vertical plane, such as blood stain patterns on a vertical surface.
 - 5.2.2.3.3. The exploded view diagram depicts a combination of floor plan and vertical diagrams, with the vertical surfaces "folded down" onto the horizontal plane.
 - 5.2.2.3.4. The perspective diagram is usually a 3D view or orthographic view of the scene.
- 5.2.2.4. The Crime Scene Investigator (CSI) is not limited to one sketch or diagram, it may be necessary to draw more than one.
 - 5.2.2.4.1. For example, one sketch or diagram may be devoted to the room containing the victim's body and items of evidence.
 - 5.2.2.4.2. Additional sketches or diagrams could depict the layout of the rest of the scene with respect to the point of entry/exit and other items of evidence.
- 5.2.2.5. Based on the complexity of the scene and seriousness of the crime being investigated, the CSI must determine the value of just completing a sketch or diagram.

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- 5.2.2.5.1. The crime scene diagram should be hand-drawn or computer-generated. For those scenes requiring a diagram, the default CAD application for generating crime scene diagrams is Faro Zone 3D®. This does not prohibit a CSI for creating additional computer-generated diagrams utilizing alternative software.
- 5.2.2.5.2. Depending on the simplicity of the scene, a sketch may be sufficient to properly document and represent the scene. More complex scenes may require a detailed diagram for court purposes.
- 5.2.2.5.3. The sketch should include measurements, notations depicting conditions, probative items of evidence, notes, and critical features of the crime scene.
- 5.2.2.5.4. The location of items should be indicated by measurements from at least two fixed points or planes. When the sketch is drawn on the [CSI Field Guide and Notes](#), only that information not recorded elsewhere on the form is required to be included on the sketch.
- 5.2.2.6. A diagram should be completed at the request of the investigator and/or prosecutor for presentation in court.
 - 5.2.2.6.1. A proper crime scene diagram shall include the following case identifying information: case number, date, location, a scale or notation that the diagram is not to scale, name and PE number of the person creating the diagram, and a north compass direction indicator when appropriate.
 - 5.2.2.6.2. The victim's name, suspect's name, and the type of crime are recommended.
 - 5.2.2.6.3. The CSI should ensure that the original or "working" Faro Zone® Project (.fzproj) file is saved in the CSI Archive in the appropriate case file, for future editing or revisions should the need arise. A PDF® version of the diagram shall be added to the case report as an attachment within 30 days of working the scene.
 - 5.2.2.6.4. 3D laser scanning may be utilized; however, it is the primary CSI's responsibility to ensure that the most probative measurements are recorded that would enable the CSI to complete a diagram should the FARO scanner fail.
- 5.2.2.7. Measurements recorded on sketches or diagrams shall be considered approximations unless otherwise documented.
 - 5.2.2.7.1. General crime scene measurement increments shall be made at a minimum to the nearest ½ inch.
 - 5.2.2.7.2. Exceptions of this may be made for outdoor scenes.
 - 5.2.2.7.3. Examples of circumstances that may dictate using closer measurements would be detailed sketching of bullet hole locations, or individual bloodstains for purposes of possible reconstruction.
 - 5.2.2.7.4. For ease of comprehension, distances greater than thirty-six inches should be recorded in feet and inches.

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5.2.2.7.5. The rectangular coordinate method is easiest to comprehend. However, the triangulation method is useful in the outdoor situation where there are no easily identifiable reference points.

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5.3. LASER SCAN

5.3.1. Introduction

The laser scanners are a secondary way of documenting a crime scene. Sketches and measurements of critical evidence shall be taken using traditional methods. Laser scanners are capable of collecting millions of measurements in a short period of time dependent upon the resolution settings established by the operator. The laser scanners may be used for interior and exterior scenes. The laser scanners operate based on line-of-sight requiring the scanner to be moved to various locations within the scene to capture data to create a three-dimensional (3D) model.

Equipment

- 5.3.1.1. The Crime Scene Investigations Section utilizes three models of FARO brand laser scanners, the Focus M70, Focus S70, and Focus Premium.
- 5.3.1.2. The Focus M70, Focus S70, and Focus Premium captures data in a 70-meter radius. All are weather resistant; allowing the device to be used in rain or snow, however doing so will create additional “noise” within the scan and is not recommended.
- 5.3.1.3. The M70 and S70 have a High Dynamic Range (HDR) camera which captures detailed imagery while providing a natural colorization of the individual points of the scan data, if the operator deems it is needed.

5.3.2. Procedure

- 5.3.2.1. The laser scanners use a Class 1 laser operating at a wavelength of 1550 nanometers which does not require eye protection. The scanners may collect photographic images to colorize the point cloud and create panoramic images of the scan location when sufficient ambient light is present. The camera may be disabled when scanning scenes with insufficient ambient light or photographic images are deemed unnecessary by the operator.
- 5.3.2.2. Operators shall have attended training by a qualified operator or outside training specific to the hardware and software utilized. All officer-involved shooting scenes shall be documented by a department-issued device or devices capable of collecting point cloud data for diagramming purposes or to facilitate the reconstruction of the incident. Homicide scenes should be scanned if possible. Trained operators shall make the determination whether a scene should be scanned and how it will be scanned. They shall also determine if a scene is unable to be scanned due to inclement weather, danger to the operator/equipment or other unforeseen circumstances. Operators should conduct a walkthrough of the scene to determine best laser scanner placement.
- 5.3.2.3. If necessary, targets should be placed within the scene to assist with registration. Targets may consist of spheres, checkboard targets, and/or National Institute of Standards and Technology (NIST) traceable targets. Targets shall be placed at varying locations and heights within the scene that align with the scanner between 45 and 90 degrees for proper detection.
- 5.3.2.4. The memory card shall be formatted in the laser scanner prior to the scanning of each scene. A case number shall be requested and used to name the scanning project. The operator shall adjust the resolution and quality settings, as necessary. The operator

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may also activate or deactivate the onboard camera as needed. While scanning, keep the scene as static as possible and avoid personnel walking through the area being scanned. The operator shall place a known scale or NIST traceable target discreetly within the scene to assist in verification of the laser scanner's accuracy within the Scene[®] software for at least one or more scans.

- 5.3.2.5. While scanning, scans may be deleted, as necessary. The operator shall document in the CSI Field Guide and Notes the reason why the scan was stopped and deleted. Prior to departing the scene, the operator should remove the memory card and check the properties of each scan taken to determine that the scene was successfully scanned.
- 5.3.2.6. The data collected on the memory card is to be saved as soon as possible on the designate network drive. A file will be created using the case number associated with the scene followed by the operator PE number. The area scans collected by the laser scanner associated with the case shall be saved on the server under the appropriate case number. All other Scene[®] or FAROZone[®] files shall be saved on the CSI's issued external backup drives. The file shall be updated as necessary by the original operator or designee.
- 5.3.2.7. To create a 3D view, import collected scan data into the Scene[®] software. Scene2Go[®] is a portable file sharing function which allows the operator to virtually navigate the scene utilizing the point cloud data and images created in the Scene[®] software. The scans are processed and registered using the Scene[®] software. Once a model is created, measurements may be obtained, and orthographic images captured for analytical or demonstrative purposes. The process of registering scans may take several minutes to several hours depending on the number of scans taken at a scene and the resolution settings. The model, or point cloud, may be imported into software, i.e., FARO Zone 3D[®], to create diagrams and other features not found in the Scene[®] software.
- 5.3.2.8. Annually, the assigned CSI shall check laser scanners for accuracy of +/- 3 millimeters using known distances of between 10 to 30 meters and NIST traceable devices.
 - 5.3.2.8.1. Laser scanners that are out of calibration shall be removed from service immediately and Crime Scene Investigations Supervisor and the Crime Scene Investigations Section Commander shall be notified.
 - 5.3.2.8.2. The certified calibration certificates shall be maintained on the network drive.
- 5.3.2.9. The CSI should update the laser scanners firmware when updates are available.
- 5.3.2.10. When deployed to scan a crime scene, the operator shall create a Scene2Go[®]/Zone2Go[®] and a diagram. These shall be provided to the investigating officer. Additional deliverables can be created at the operator's discretion or upon request from the investigator or prosecutor. If being assisted by the ISP Crash Reconstruction Unit, they may create the diagram if they agree to do so. This shall be documented in the operator's notes.

5.4. Bullet Trajectory with Faro3D

- 5.3.3.1 A laser scanner and accompanying software (Faro3D[®]) can be used to document shooting incident scenes.
- 5.3.3.2 The operator must be released to document scenes independently and shall have successfully completed training in the deployment and utilization of the issued

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trajectory spheres, prior to being authorized to document bullet trajectories with the laser scanner.

- 5.3.3.3 Operators shall have attended an approved Shooting Incident Reconstruction (SIR) course and understand the utilization of trajectory rods prior to being authorized to document bullet trajectories with the laser scanner.
- 5.3.3.4 When there are projectile holes present at a shooting incident that are suitable for utilization in determining trajectories, the operator can choose to document them with the laser scanner or by traditional hand measurements.
- 5.3.3.5 Any projectile holes used in determining trajectories shall be documented with digital photography with a scale prior to inserting a trajectory rod. Photographs should also be taken after the insertion of trajectory rods.
- 5.3.3.6 The operator shall place a known scale or NIST traceable target discreetly within the scene to assist in verification of the laser scanner's accuracy within the Scene® software for at least one or more scans.
- 5.3.3.7 Only issued trajectory spheres shall be utilized. Two (2) spheres should be placed on each trajectory rod with as much space between them as the trajectory rods will allow without deflecting from its natural position.
- 5.3.3.8 A minimum of three (3) scans should be taken when documenting trajectory. These scans should be taken to capture left, right, and center of each trajectory rod. These scans shall be at a minimum resolution of one-quarter (¼) and 3x quality. The remainder of the scene can be scanned at an appropriate resolution and quality, as determined by the operator.
- 5.3.3.9 The data collected on the memory card shall be saved as soon as possible on the designate network drive. A file will be created using the case number associated with the scene followed by the operator PE number. The area scans collected by the laser scanner associated with the case shall be saved on the server under the appropriate case number. A project point cloud shall be created in Scene® and saved within the file with the raw scan data.
- 5.3.3.10 The operator shall import a copy of the project point cloud into FAROZone® and utilize the Bullet Trajectory Tool to generate a "Trajectory Report". The Trajectory Report shall be saved with the raw scan data and point cloud on the network drive.
- 5.3.3.11 Once all information is saved on the network file and before the Trajectory Report may be attached to the RMS Case Report, the originating Scanner Operator shall request a second approved operator review their findings. This review shall include the verification of all trajectories and shall be documented on the **Faro 3D Bullet Trajectory Analysis Technical Review Worksheet**. The completed review worksheet shall be saved in the network drive folder with the scan data and point cloud. The reviewing operator shall notify the originating operator of their findings.
 - 5.3.3.11.1 If the reviewing operator concurs with the originating operators findings the Trajectory Report shall be attached to the RMS Case Report.
 - 5.3.3.11.2 If the reviewing operator disagrees with the originating operator findings, the Faro Laser Scanner Coordinator shall be notified, who will review the case and work with the Crime Scene Section Commander to resolve.

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6. BIOLOGY

6.1. BIOLOGICAL EVIDENCE

6.1.1. Introduction

Biological evidence may be found in many forms and conditions. A crime scene may yield, in addition to liquid blood or dried bloodstains, other biological evidence such as semen, saliva, tissue, hair, urine, perspiration, tears, bones, teeth, and skin cells. There is great potential for productive deoxyribonucleic acid (DNA) analysis of these biological sources. Crime solvability increases exponentially when such materials are properly recovered and compared to known standards from victims and suspects and the Combined DNA Index System (CODIS) database. Due to degradation, potential for contamination, and biological hazards associated with this type of evidence, proper recovery, handling, packaging, and storage is essential.

6.1.2. Safety

The Crime Scene Investigator (CSI) shall exercise universal precautions when handling blood, semen, and other biological material. Disposable gloves and surgical masks shall be worn when working with these substances. Biohazard suits, shoe covers, and eye protection shall be considered in scenes where there is a possibility of transfer or splattering. CSI's shall take precautions to not talk over a potential DNA sample. Refer to [Laboratory Safety Policy #008](#).

6.1.3. Procedure

- 6.1.3.1. All areas of bloodstains, semen, or other biological material shall be documented by photography, and, when applicable, sketching and videography.
- 6.1.3.2. Conducting presumptive field tests (e.g., Hemastix and Luminol) for the presence of blood should be considered on questionable stains. When a field test would consume the stain(s), field testing shall not be conducted. [See Section 14.3 - Chemical Reagents](#) for further information on presumptive blood identification tests.
- 6.1.3.3. Dried stains on a non-porous surface that are not removable, shall be collected by one of the following options:
 - 6.1.3.3.1. Moisten a sterile swab with deionized or distilled water, swab the stain, air dry and package in a breathable container;
 - 6.1.3.3.2. Scrape the stain onto a clean piece of paper using a sterile scalpel, fold into a bundle and package in paper; or
 - 6.1.3.3.3. Place a fingerprint lifter over the stain, press and lift, and place it on a fingerprint backer. Package in paper.
- 6.1.3.4. For wet/liquid stains use a sterile swab to absorb the liquid, air dry and package in a breathable container.
- 6.1.3.5. If wet items are received from a third party, such as another agency, police officer, or hospital personnel, that have been packaged in plastic, remove the evidence from the plastic packaging, air dry the items, and repackage in a breathable container. The original packaging should be dried and retained and/or photographed.

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- 6.1.3.6. Wet garments/items shall be air dried, then wrapped so the stains are not transferred to unstained areas. Package each article in separate paper bags. An exception would be if the CSI received more than one article packaged together from a third party.
- 6.1.3.7. Utilizing an alternate light source (ALS) shall always be considered when evaluating for stains.
- 6.1.3.8. Before removing stained bed sheets, blankets or pillows from a bed, the CSI should, when applicable, mark the items to show positioning, i.e., “head”, “foot”, and “side”.
- 6.1.3.9. Stains that have been absorbed into surfaces, such as carpet, fabric, vinyl, wood, paper, cardboard, etc., may be cut out. Consider checking with the prosecutor before cutting surfaces of value.
- 6.1.3.10. The CSI shall change gloves, use disposable tweezers, or clean the tweezers with alcohol wipes between recovering each new item of biological evidence to prevent cross-contamination.
- 6.1.3.11. Equipment used at a crime scene shall be cleaned with alcohol wipes or 10% bleach solution prior to examining the next crime scene.
- 6.1.3.12. Biological evidence shall have biohazard warning stickers affixed to the outside packaging.

6.1.4. References

- 6.1.4.1. [Laboratory Safety Policy #008 - Universal Precautions](#)
- 6.1.4.2. [Physical Evidence Bulletin \(PEB\) 15 - CODIS](#)
- 6.1.4.3. [PEB-17 DNA](#)
- 6.1.4.4. [PEB-21 Missing Persons-Unidentified Human Remains](#)

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6.2. BLOODSTAIN PATTERN DOCUMENTATION

6.2.1. Introduction

It is common to find bloodstain evidence associated with crimes of violence. The physical characteristics of bloodstain evidence may provide information about the events that created them. The shape, size, and distribution of bloodstain evidence may provide useful information. When applicable, proper documentation of bloodstain evidence sufficient to enable an authorized bloodstain pattern analysis (BPA) analyst to conduct a reconstruction of the events that caused the stains shall be considered.

Possible determinations that may be made from examining bloodstain evidence are:

- a) the position and/or movement of persons or objects;
- b) sequencing of events;
- c) an approximate number of blows struck or shots fired; and
- d) the area of origin of a blood source in three-dimensional space, and the type of weapon involved.

6.2.2. Procedure

- 6.2.2.1. When examining a crime scene where bloodstain evidence may assist in the reconstruction of the crime, an authorized BPA analyst should be contacted. It is preferable for the BPA analyst to examine the original scene; however, analysis may be performed from a well-documented scene.
- 6.2.2.2. The shape of a bloodstain, (e.g., round verses oblong), may be used to determine its angle of impact. The more elongated the bloodstain, the sharper the angle of impact from its origin.
- 6.2.2.3. The directionality of bloodstains may also be determined. With well-formed teardrop shaped stains, the pointed end will point towards the direction of travel.
- 6.2.2.4. The size of the bloodstains within a pattern may indicate the amount of force used. Thus, the smaller the stains, the higher the force and the larger the stains, the lower the force.
- 6.2.2.5. The Crime Scene Investigator (CSI) shall document bloodstain evidence through a combination of notes, diagrams, and photographs. Recording the location, stain sizes, and distribution of bloodstain patterns with respect to the overall crime scene, is vital for analysis.
- 6.2.2.6. Collection of the actual substrate containing a bloodstain pattern is a valid method to document this evidence.
- 6.2.2.7. When documenting bloodstain evidence, the CSI should consider an attempt to segregate patterns that were created by separate bloodletting events.
- 6.2.2.8. Measure the overall size of the patterns and their locations from walls, floors, etc.

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- 6.2.2.9.** Assigning stain patterns a label such as “A” and choosing well-formed stains within the pattern and assigning labels such as “A-1”, “A-2”, “A-3”, etc., is recommended to assist with reconstruction. Also, place a scale (millimeter) next to each stain that was labeled with the pattern. Measure the locations of each of the chosen stains from walls, floors, etc., and take perpendicular overall, medium, and technical photographs of the chosen stains within each pattern.
- 6.2.2.10.** Representative stains within separate patterns shall be collected for DNA analysis, for reconstruction purposes.
- 6.2.2.11.** The CSI shall consider collecting clothing from any persons involved in a bloodshed incident. Bloodstain pattern analysis on clothing is best suited for examination in the laboratory.
- 6.2.2.12.** No CSI shall state opinions, or issue a written report stating conclusions based upon bloodstain patterns, unless that CSI has successfully completed an approved bloodstain pattern analysis school and been authorized by the Laboratory Division Commander.
- 6.2.2.13.** Stains that have the obvious and reasonable appearance of being blood due to the physical characteristics present, scene context, and the CSI knowledge, training, and experience may be referred to as being blood if combined with a preceding qualifier (i.e., apparent blood, appeared to be blood, etc.) within the CSI written report.
- 6.2.2.14.** A single, general qualifying statement may replace overly repetitive usage of a preceding qualifier within the CSI written report.
- 6.2.2.15.** When obvious physical characteristics are insufficient and/or scene context is limited to reasonably refer to stains as ‘apparent blood’ etc., it is recommended that the CSI conservatively refer to the stain(s) only by the physical characteristics present within the CSI written report.
- 6.2.2.16.** If presumptive testing for blood is conducted by the CSI at the scene, the CSI may refer to that stain and associated stains with similar physical characteristics and scene context as being ‘presumptive blood’ and/or ‘apparent blood,’ etc. Results of positive presumptive testing shall be included in the CSI written report.
- 6.2.2.17.** When laboratory results confirm the presence of blood, the CSI may refer to that stain and associated stains with similar physical characteristics and scene context as being blood within the CSI written report.
- 6.2.2.18.** The CSI written report shall concentrate primarily on the physical characteristics of apparent bloodstain patterns (i.e., size, shape, distribution, location).
- 6.2.2.19.** When an authorized CSI performs BPA, the Bloodstain Pattern Analysis Procedures Manual shall be followed.

6.2.3. References

- 6.2.3.1.** [Bloodstain Pattern Analysis Procedures Manual](#)

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7. LATENT PRINTS

7.1. LATENT PRINT IMPRESSIONS

7.1.1. Introduction

7.1.1.1. The ridge detail of fingerprints, including but not limited to, ridge endings, bifurcations, dots, islands, and their relationship to each other constitutes the basis for identification of fingerprints.

7.1.1.2. Latent prints are divided into two categories, Invisible and Visible.

7.1.1.2.1. Invisible prints – prints made by perspiration and other substances on the skin surface and which require development by physical or chemical methods (Latent Prints).

7.1.1.2.2. Visible prints are divided into two categories, Plastic and Patent.

7.1.1.2.2.1. Plastic prints – prints made in soft pliable substances such as putty or clay, etc.

7.1.1.2.2.2. Patent prints – prints made by contamination of the skin with such substances as blood, paint, ink, etc.

7.1.2. Equipment

7.1.2.1. District facilities may have a fuming cabinet for latent print processing.

7.1.2.2. The following maintenance shall be performed for the fuming cabinets:

7.1.2.2.1. The pre-filter shall be inspected annually and changed if any discoloration is found. The inspection and, if necessary, the pre-filter change, shall be documented in Maintenance Log.

7.1.2.2.2. When the pre-filter is changed, the humidifier filter shall be inspected and changed if any signs of use are found. The inspection and, if necessary, the humidifier filter change, shall be documented in the Maintenance Log.

7.1.2.2.3. The main carbon filter shall be changed after the fuming cabinet is used 100 times. The change of the main carbon filter shall be documented in the Maintenance Log.

7.1.2.2.4. A Chamber Cycle Log should be completed each time the fuming cabinet is used.

7.1.2.3. If there is a problem with a fuming cabinet, the Crime Scene Investigations Supervisor shall be notified.

7.1.2.3.1. The fuming cabinet shall be labeled “out of service”.

7.1.2.3.2. Repairs shall be documented in the Maintenance Log.

7.1.3. Procedure

7.1.3.1. The Crime Scene Investigator (CSI) shall evaluate all surface areas in and around the scene of a crime that has potential of retaining latent or patent impressions, such as areas identified as the point of entrance/exit, and any place where there was apparent activity by a perpetrator. Individual evidence items that require latent print

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examination may be collected and submitted to a Regional Laboratory for examination or examined later by the CSI.

- 7.1.3.2. Refer to [Physical Evidence Bulletin # 10](#) for fingerprint evidence, packaging, and handling.
- 7.1.3.3. The CSI should consider requesting a Latent Print Examiner from a Regional Laboratory when examining a major crime scene for latent impressions. The Examiner may be able to further enhance latent prints with dyes and/or stains or other techniques.
- 7.1.3.4. Latent impressions recovered from different objects shall be packaged separately. Multiple lifts from the same object or side of a glass may be packaged together as one item, (e.g., three latent lifts recovered from the inside of the driver's window may be packaged as one item).
- 7.1.3.5. Developed latent impressions shall be photographed for orientation purposes. Technical photography of developed latent impressions for comparison purposes shall be taken.
- 7.1.3.6. Developed latent impressions shall be lifted when possible and properly identified with markings that include the case number and location. When applicable a diagram and orientation arrow should be included.
- 7.1.3.7. Latent impressions shall be submitted to a Regional Laboratory for comparison to known standards when available, or for Automated Fingerprint Identification System (AFIS) entry if standards are not available.
- 7.1.3.8. Evaluate less obvious areas and items such as drawers, knobs, handles, light switches, tabletops, food items, or drinks, etc. A person familiar with the layout of the scene may be allowed to observe a preliminary walk-through and to point-out items that appear out of place or identify objects that were potentially brought into the scene by the perpetrator.
- 7.1.3.9. Visible prints in blood, ink, paint, grease, dirt, putty, etc. shall be technically photographed before being recovered. The surface on which the impression rests shall then be collected and packaged, when possible, in a way to protect the fragile evidence.
- 7.1.3.10. The lift tab shall be placed on a black or white backer, whichever shows best contrast. If the CSI leaves their own impression on a lift tab, it shall be crossed-out and initialed. If removing the lift tab may damage the impression, it shall be left on the surface and the entire object collected.
- 7.1.3.11. Nonabsorbent, hard, smooth surfaces should be examined using powders of contrasting color to the surface. If the surface is non-metallic, magnetic powder and brush should be used. Magnetic powder and brush should also be used on semi-porous surfaces such as slick paper or cardboard.
- 7.1.3.12. Cyanoacrylate "superglue" fuming shall be considered on nonabsorbent surfaces i.e., glass, plastic, metal, plastic bags, foil, vinyl, rubber, lacquered wood, etc.

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Cyanoacrylate fuming at the crime scene is preferred over transporting items to be fingerprinted at another location or the laboratory.

- 7.1.3.13. Objects to be submitted for laboratory latent examination shall be packaged so they are immobile. Absorbent items not yielding obvious prints at the scene should be collected and properly packaged for laboratory examination.
- 7.1.3.14. Use of alternate light sources (ALS) should be considered, see [Section 14.1](#). ALS may enhance impressions that are not developed by other techniques. The use of fluorescent powder should be used in conjunction with an ALS.
- 7.1.3.15. Surfaces with biological contaminants should be cyanoacrylate fumed or dusted with a sterile brush and an aliquot of powder prior to swabbing the area for DNA evidence. The aliquot of powder shall be discarded when finished and not returned to the original powder container. Consider consulting with a DNA Analyst or Latent Print Examiner.
- 7.1.3.16. Small Particle Reagent (SPR) should be considered for wet, non-porous surfaces.
- 7.1.3.17. Leuco Crystal Violet (LCV), should be considered for faint bloody impressions, see [Section 14.3 Reagents](#).
- 7.1.3.18. The use of Mikrosil should be considered for rough or curved surfaces.

7.1.4. Developing Latent Prints On Human Skin

- 7.1.4.1. Obtaining identifiable latent impressions from human skin is typically performed by the CSI, however a Latent Print Examiner should be considered to assist.
- 7.1.4.2. The types of investigations when latent prints on skin should be considered are when the victim was moved, undressed, sexually assaulted, restrained, or strangled. Smooth, hairless skin is most conducive for developing latent prints, (e.g., the neck, head, wrist, upper arms, thighs, and ankles).
- 7.1.4.3. Development of latent fingerprints on skin is most successful when completed within approximately 48 hours of the time of death.
- 7.1.4.4. Optimum skin temperature is between 70 and 80 °F.
 - 7.1.4.4.1. Avoid subjecting the body to refrigeration or dramatic temperature change.
 - 7.1.4.4.2. When temperatures exceed 110 °F positive results are unlikely.
- 7.1.4.5. If the location where the body is discovered is conducive for examination, the examination should be conducted at the scene.
- 7.1.4.6. If the location is not conducive to the latent print examination and the victim is going to be transported, movement/handling shall be conducted in a manner to preserve potential latent impressions.
- 7.1.4.7. Avoid contacting areas on the body that may contain prints and keep the body bag from contacting the body.

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7.1.4.8. Examine the victim with white light and ALS. Potential DNA and trace evidence shall be considered when examining the skin for latent impressions.

7.1.4.9. Lift Transfer Method

7.1.4.9.1. Apply a section of glossy photographic paper, large fingerprint backer, glass, mirror, or metal plate as a transfer surface, directly over the area to be examined for latent prints. Hold in place applying uniform pressure for approximately 20 seconds.

7.1.4.9.2. If the skin surface is warm, apply a cool transfer surface against the skin. If the skin is cool, apply a warm transfer surface against the skin. Remove from skin and examine with magnetic or regular fingerprint powder.

7.1.4.9.3. An alternative method is to cyanoacrylate fume the transfer surface to develop latent prints which may have transferred. Condensation on the body is acceptable, as any water in the latent print residue will aid polymerization with cyanoacrylate fumes. After fuming, further development of the nonporous transfer surface may include luminescent dye stain, ALS examination, or fingerprint powder.

7.1.4.9.4. Cash register or thermal paper may also be used as a transfer medium by applying uniform pressure for approximately 20 seconds. A hand sponge or soft pad should be placed between the CSI's hand and the thermal paper to improve contact with the skin.

7.1.4.10. Powdering Method

7.1.4.10.1. Apply magnetic powder (best results) or regular fingerprint powder directly to the skin.

7.1.4.10.2. Avoid over powdering areas on the body.

7.1.4.10.3. Single use, sterile powder and brushes shall be used to prevent cross contamination for DNA.

7.1.4.10.4. Developed impressions shall be technical photographed and collected by utilizing Mikrosil™ casting material following the manufacturer's instructions.

7.1.5. References

7.1.5.1. [Physical Evidence Bulletin \(PEB\) 10 Latent Prints](#)

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7.2. *ROLLED FINGERPRINT IMPRESSIONS (including Major Case Prints)*

7.2.1. Introduction

Major Case Prints consist of recording all the friction ridge detail present on the palm surfaces of the hand and the inner surfaces of the fingers. Obtaining rolled fingerprint impressions and/or Major Case Prints from suspects, as well as from all person(s) who legitimately would be expected to leave latent impressions at the crime scene should be evaluated.

Major Case Prints are used to make comparisons with latent impressions. This includes the extreme sides of the palms and the extreme tips, sides, and lower joints of the fingers.

7.2.2. Procedure

7.2.2.1. Obtaining Prints on a Fingerprint Card

7.2.2.1.1. Fingerprint card from a Live Scan Automated Fingerprint machine may be obtained from law enforcement agency or the CSI may collect the prints manually.

7.2.2.2. Manual Fingerprinting Procedure

7.2.2.2.1. The subject shall sign the fingerprint card. If the subject refuses to sign, the CSI shall write "Refused" in the signature block.

7.2.2.2.2. Have the subject wash and dry his/her hands.

7.2.2.2.3. The CSI should wear gloves to avoid getting ink on his/her hands.

7.2.2.2.4. Roll black printer's ink over the entire ridged surface of the fingers, from tip to below first joint and from fingernail to fingernail.

7.2.2.2.5. Instruct the subject to relax arm and hand muscles.

7.2.2.2.6. Grasp the subject's hand, hold the four fingers back, and print the thumb by rolling it toward the body. Immediately roll the inked thumb in the designated space on the card and repeat the process for each of the fingers, rolling them away from the subject's body.

7.2.2.2.7. To make simultaneous impressions, the prints are not rolled; rather the four fingers, extended and joined, are inked and the print is made by exerting a straight-down pressure. The process is repeated for the thumbs (again no rolling).

7.2.2.2.8. Repeat the process above with subject's other hand.

7.2.2.3. Major Case Prints Procedure (Rolled)

7.2.2.3.1. Use a standard 8½ x 11 inches, or similar, piece of white paper. Obtain as many sheets as are necessary to achieve satisfactory impressions. At least two will be needed, using one for each hand.

7.2.2.3.2. Have the subject sign the paper. If the subject refuses to sign, the CSI shall write "Refused" in the signature block.

7.2.2.3.3. Have the subject wash and dry his/her hands, if not already accomplished.

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- 7.2.2.3.4. Roll black printer's ink over all ridged surfaces on palm side of the hands.
- 7.2.2.3.5. Attach the paper to the edge of a table so as to allow no movement of the paper.
- 7.2.2.3.6. Record the prints of each entire finger, by rolling from one side to the other, onto the paper.
- 7.2.2.3.7. Above or next to each rolled finger impression, place an impression from the corresponding fingertip.
- 7.2.2.3.8. Place an impression of the edge of the palm that corresponds to the little finger.
- 7.2.2.3.9. Hold the thumb horizontally and firmly press the outer edge of the thumb onto the paper, being sure that the areas between the joint make contact with the paper. Remove the thumb from the paper by lifting up from the palm all the way to the nail.
- 7.2.2.3.10. Place the center portion of the thumb on the paper. Again, press down firmly and rise from the palm to the nail.
- 7.2.2.3.11. Place the inner edge of the thumb on the paper. Apply firm pressure and again raise the thumb from palm to nail.
- 7.2.2.3.12. Place the outside edge side of the tip of the thumb on paper and roll completely from one side to the other.
- 7.2.2.3.13. Label the right hand series of fingerprints as "Rt thumb, Rt index, Rt middle, Rt ring, Rt little". Repeat this labeling process with the left hand series. Attach the paper, or an additional piece of paper, on a cylindrical object three or more inches in diameter and eight to ten inches in length.
- 7.2.2.3.14. The paper should be affixed to the tube on each edge.
- 7.2.2.3.15. Place the heel of the palm on the upper edge of the paper with the fingers together and pointed straight ahead. The person taking the prints should lay his/her hand over the hand being printed, using just enough pressure to ensure firm contact of the subject's palm surface with the paper.
- 7.2.2.3.16. Roll the cylinder backward toward the subject until the tip areas of the fingers are recorded. Keep the hand in a horizontal position so the areas of the palm and fingers are recorded. The hand will automatically be removed from the paper by rolling the tube.
- 7.2.2.3.17. Packaging shall be a large envelope or similar object that prevents the prints from being folded during storage.

7.2.2.4 Major Case Prints Procedure (Powder/Transparency)

- 7.2.2.4.1. Use an issued 8½ x 11", Major Case Print Transparency Sheet. Obtain as many sheets as necessary to achieve satisfactory impressions; at least two will be needed, using one for each hand.
- 7.2.2.4.2. Have the subject sign the transparency sheet. If the subject refuses to sign or becomes noncompliant the CSI can write "refuse to sign" in the box.

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- 7.2.2.4.3. Have the subject wash and dry his/her hands, if not already accomplished.
- 7.2.2.4.4. Apply black powder over all ridged surfaces on palm side of the hands with a brush.
- 7.2.2.4.5. Apply an issued white label to each finger, bending the label to capture the tip of the fingers.
- 7.2.2.4.6. Remove each white label and affix it to the corresponding location on the transparency.
- 7.2.2.4.7. Apply additional black powder to the palms and edges of the hand.
- 7.2.2.4.8. Apply the issued gray label to the entirety of the hand, bending the label around the edges of the hand and up the wrist to capture the edges of the palm and creases of the wrist.
- 7.2.2.4.9. Remove the gray label and affix it to the corresponding location of the transparency.
- 7.2.2.4.10. Packaging shall be a large envelope or similar object that prevents the prints from being folded during storage.

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8. TRACE

8.1. TRACE EVIDENCE

8.1.1. Introduction

Trace evidence may be any substance that may or may not be visible to the unaided eye. It is transferred from one person, place, or thing to another person, place, or thing as a result of contact or near contact (Locard's Exchange Principle). Trace evidence may be overlooked due to its microscopic size.

The Crime Scene Investigator (CSI) should observe for paint, glass, hairs, fibers, and safe insulation, which are some of the common types of trace evidence. However, any substance should be considered as potential trace evidence, such as powders, gels, adhesives, soils, minerals, plasterboard dust, wood splinters, plastic, rubber, metals, vegetation, and lamps.

8.1.2. Procedure

- 8.1.2.1. The CSI should evaluate the scene for trace evidence. The CSI should consider an Alternate Light Source (ALS) or flashlight with oblique lighting.
- 8.1.2.2. The CSI shall document the locations where the trace evidence and standards were recovered by photography and sketching.
- 8.1.2.3. The CSI shall be aware of the possibility of secondary or tertiary transfer of trace evidence.
- 8.1.2.4. Trace evidence standards shall be recovered from the crime scene for comparison purposes.
- 8.1.2.5. Obtain the standard samples of the known substance near, but not in contact with the suspected trace evidence recovery.
- 8.1.2.6. Methods of collecting trace evidence include by hand, with tweezers, post it notes, lifting tape, scraping, cuttings, or vacuum sweeping.
 - 8.1.2.6.1. When possible, the CSI shall collect and properly package all visible trace evidence by hand or with tweezers before using the other collection methods.
 - 8.1.2.6.2. Vacuum sweeping shall be last method of trace evidence collection and used only when necessary.
- 8.1.2.7. When practical, collect and submit the entire item, e.g., floor mats or truck liners, for the examination of trace evidence at the laboratory.
- 8.1.2.8. When packaging, the size of the container should correspond to the size of the object. Paper bindles should be considered when dealing with very small particles. If bindles are used, they shall be placed into a larger package. Tape edges (e.g., ends of envelopes and all-around pill boxes) container to prevent loss.
- 8.1.2.9. Never package damp evidence in plastic bags.
- 8.1.2.10. The clothing of the suspect may contain trace evidence. Clothing and shoes should be recovered as soon as possible. Other sources of trace evidence may be automobile seats and interiors, pry tools, and fingernail scrapings.

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8.1.2.11. The CSI should be aware of possible cross contamination of evidence during packaging. Keep questioned samples and standards separated during collection, examination, and packaging.

8.1.3. References

8.1.3.1. [Physical Evidence Bulletin \(PEB\) 02 Paint and Plastics](#)

8.1.3.2. [Physical Evidence Bulletin \(PEB\) 03 Glass](#)

8.1.3.3. [Physical Evidence Bulletin \(PEB\) 04 Fiber](#)

8.1.3.4. [Physical Evidence Bulletin \(PEB\) 05 Ignitable Liquid Residues](#)

8.1.3.5. [Physical Evidence Bulletin \(PEB\) 06 Lamps](#)

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8.2. FOOTWEAR AND TIRE IMPRESSIONS

8.2.1. Introduction

Footwear and tire impressions usually form in soil, mud, snow, or as latent or visible prints on floors, doors, glass, etc. Impression evidence may be fragile in nature; therefore, the Crime Scene Investigator (CSI) shall document, collect, or preserve this evidence in a timely manner. Photograph all visible impressions prior to casting or lifting.

8.2.2. Procedure

- 8.2.2.1. Evaluation for footwear and tire impressions should be completed at points of entry to buildings, interior rooms, areas of activity by the perpetrator, and exit routes by using oblique lighting.
- 8.2.2.2. Impressions shall be photographed using techniques outlined in the Crime Scene Photography [Section 4.1](#).
- 8.2.2.3. Sketches shall reflect the position of the impressions to fixed reference points.
- 8.2.2.4. When available, known footwear standards should be collected from the scene or from individuals for comparison.

8.2.3. Latent Impressions

- 8.2.3.1. Latent footwear and tire impressions may be recovered using the techniques described in the [Section 7.1](#), by utilizing powder and brush with large adhesive lift tabs or gelatin lifters.

8.2.4. Bloody Impressions

- 8.2.4.1. Leuco Crystal Violet (LCV), or other appropriate reagents, shall be considered to enhance faint bloody footwear or tire impressions using the technique in [Section 14.3](#).

8.2.5. Impressions in Soil

- 8.2.5.1. Prepare the impression by removing loose debris prior to casting. Embedded debris should be left in place. No debris should be removed if there is a possibility of altering any portion of the impression.
- 8.2.5.2. The CSI shall evaluate the need to pre-treat the impression prior to casting. If needed, the impression shall be pre-treated before casting by spraying an aerosol releasing agent, such as gray spray paint or hair spray, across the impression at a distance allowing the spray mist to fall into the impression. Allow to dry. Repeat until the top layer of particles are coated.
- 8.2.5.3. When needed, metal frames may be set around the impression, to contain the casting mixture.
- 8.2.5.4. Mix dental stone powder with water until it has the consistency of pancake batter in a plastic bag. Ensure all lumps are eliminated.
- 8.2.5.5. Slowly pour the mix to the side of the impression, and then on top of the casting material itself, following the flow across the impression. Care shall be taken to not

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damage the impression by force of the casting material. The dental stone should be poured to a thickness of at least one inch.

- 8.2.5.6. When the cast is set, carefully lift by digging around the perimeter so that pressure is not applied to the cast itself.
- 8.2.5.7. Do not clean the cast. Cleaning will be done by the laboratory analyst.
- 8.2.5.8. Label the back of the cast with identifying information, as any other type of evidence.
- 8.2.5.9. Package in a cardboard box.

8.2.6. Underwater Impressions

- 8.2.6.1. Impressions underwater may be cast using dental stone.
- 8.2.6.2. If the water cannot be drained away, sprinkle dry dental stone powder slowly into the water, over the impression, until it is covered by at least one inch of material.
- 8.2.6.3. Mix additional dental stone material to a slightly thicker consistency than typical, and pour the mixture on top of the previously powdered area. Allow to set until hard.
- 8.2.6.4. Recover and label casting as describe above.

8.2.7. Impressions on Concrete

- 8.2.7.1. Mud or soil impressions may be found on concrete. These impressions may sometimes be successfully lifted using a minor modification of the dental stone mixture method.
- 8.2.7.2. Utilizing duct tape, outline the perimeter of the impression on the concrete to aid in the release of the cast from the concrete.
- 8.2.7.3. When needed, place a metal frame around the impression to contain the casting material.
- 8.2.7.4. Pour the casting material onto the impression assuring that it flows onto the duct tape. Allow to set.
- 8.2.7.5. Lift the duct tape to free the cast from the concrete.

8.2.8. Impressions in Snow

- 8.2.8.1. Footwear or tire impressions in snow should be sprayed with layers of Snow Print Wax, hair spray, or spray paint prior to casting to preserve the detail.
- 8.2.8.2. Do not hold the spray can so close to the impression that the aerosol damages detail.
- 8.2.8.3. Be sure the entire impression is sealed with spray or the dental stone may seep through causing damage.
- 8.2.8.4. Mix and use a slightly thicker than typical dental stone mixture than usual.
- 8.2.8.5. The dental stone powder and water should be made as cold as possible before pouring onto the snow impression. Consider using some snow in the mixture.
- 8.2.8.6. Another method for impressions in snow is utilizing (Great Stuff Window and Door[®]) insulation spray foam.

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- 8.2.8.6.1. If the snow impression is somewhat loose or powdery, prepare the print with an aerosol spray fixative, the same as if using dental stone.
- 8.2.8.6.2. If the snow impression is frozen, no preparation is needed.
- 8.2.8.6.3. Spray the foam across the impression using the same technique as dental stone, allowing it to flow onto the impression.
- 8.2.8.6.4. Spray a thickness of approximately one inch, realizing the foam will expand further.
- 8.2.8.6.5. Once sprayed, place a sheet of plastic over the entire foam area to act as a releasing medium, (i.e., a large plastic evidence bag).
- 8.2.8.6.6. Then place a flat weighted object on top of the layer of plastic, similar in size as the impression, (e.g., a board or book).
- 8.2.8.6.7. The weight will assist with condensing the foam to fill-in the fine details of the impression.
- 8.2.8.6.8. When the foam becomes set, carefully remove the weighted object and then the foam cast from the impression.
- 8.2.8.6.9. The plastic releasing medium may be removed.
- 8.2.8.6.10. Mark the back of the cast with identifying information, package in a cardboard box or paper bag.

8.2.9. Making Exemplar Tire Impressions

- 8.2.9.1. Exemplar tire prints, for comparison to questioned impressions at a crime scene, should be taken while the tires are on the vehicle.
- 8.2.9.2. Assistance from another individual may be required to move the vehicle while collecting exemplars.
- 8.2.9.3. If tires have already been removed, when possible place the tires on a similar vehicle before making exemplars.
- 8.2.9.4. The best surfaces for creation of tire impression exemplar are a smooth concrete or asphalt. Sweep the surface where the tires will be rolled to remove debris.
- 8.2.9.5. Wipe the tires with heavy work gloves or rags to remove any surface debris. Be careful not to dislodge rocks or other objects embedded in the tread.
- 8.2.9.6. Prepare poster board, cardstock, or similar type material longer than a full continuous rotation of the tire. The typical circumference for a passenger car tire is approximately 8 feet. Tape may be used to attach the separate lengths of poster board together on the backside.
- 8.2.9.7. Place the poster board on the ground in front of the tire. It does not matter which tire is started with.
- 8.2.9.8. Mark the locations of the wear bars on the side wall of the tire using chalk or tape.
 - 8.2.9.8.1. Label each wear bar with 1, 2, 3, 4, etc.
 - 8.2.9.8.2. These are then used to indicate the location on the poster board.

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- 8.2.9.8.3. Photographs shall be taken to record the locations of these markings to assist in the comparison process.
- 8.2.9.9. The CSI shall record on the front poster board, the tire manufacturer, make, size, Department of Transportation (DOT) number, date, case number, item number, location of tire on the vehicle, the direction the vehicle was rolled (i.e., forward or reverse), and any other relevant information.
- 8.2.9.10. Using a gloved hand or shoe polish sponge apply, apply black printers ink or petroleum jelly evenly over the entire surface of the tire tread.
- 8.2.9.11. Roll the vehicle over the poster board by pushing while the vehicle is in neutral.
- 8.2.9.12. Record each wear bar location by number, and location of the air valve stem, on the poster board as the tire rotates.
- 8.2.9.13. As the tire rotates, finish spreading the ink (or petroleum jelly) over the portion of the tire that initially was in contact with the ground.
- 8.2.9.14. When examining the front tires, ensure the rear tires do not run-over the poster board used in the examination of the front tires.
- 8.2.9.15. If the exemplars do not reflect sufficient tire tread details, prepare additional exemplars. Retain all exemplars prepared.
- 8.2.9.16. Allow the ink to dry before folding or rolling-up the poster board for packaging.
- 8.2.9.17. If petroleum jelly was used, develop the tire impression with magnetic fingerprint powder only. (Regular powder with a regular brush will damage the impression).
- 8.2.9.17.1. Remove excess powder.
- 8.2.9.17.2. Spray the impression with a clear acrylic spray or hairspray to fix the powdered impression to the poster board.
- 8.2.9.17.3. Allow the spray to dry before folding or rolling-up the poster board for packaging.
- 8.2.9.18. The CSI should consider consulting with or requesting a Footwear and Tire Impression Examiner from a Regional Laboratory when examining a major crime scene.

8.2.10. References

- 8.2.10.1. [Physical Evidence Bulletin \(PEB\) 12 – Footwear and Tire Impressions](#)

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8.3. ELECTROSTATIC DUST PRINT LIFTER

8.3.1. Introduction

Electrostatic dust print lifter works on the principle of the effect of static electricity on particles of dust. This device produces an electrically charged environment onto Mylar paper to which particles are attracted. Dust prints are commonly not visible to the unaided eye without oblique lighting.

8.3.2. Safety

Although high voltages are used in the recovery of dust print evidence, the amperage is quite low. Thus, an inadvertent shock from the device is not dangerous.

8.3.3. Procedure

8.3.3.1. Crime scenes will be routinely evaluated for dust print impressions.

8.3.3.1.1. The CSI shall evaluate all surface areas in and around the scene of the crime that have the potential of retaining dust print impressions.

8.3.3.1.2. These areas include entry points or attempted points of entry and possible access or attempted access to interior rooms.

8.3.3.1.3. Doors that may have been kicked or areas where the suspect likely stepped should be routinely evaluated for dust prints.

8.3.3.2. Oblique lighting shall be used in the evaluation for dust prints.

8.3.3.3. Orientation photographs should be taken.

8.3.3.4. Dust prints shall be technically photographed with and without scale using oblique lighting before lifting.

8.3.3.5. The electrostatic dust print lifter procedure:

8.3.3.5.1. Place black side of Mylar paper onto the print, insuring enough coverage.

8.3.3.5.2. Place metal plate approximately 3 inches from the paper.

8.3.3.5.3. Place the two device nodes onto edge of Mylar paper and single node onto the metal plate.

8.3.3.5.4. Turn on the device until Mylar paper begins to adhere to the print.

8.3.3.5.5. Using a roller, roll out air bubbles and creases in the Mylar paper.

8.3.3.5.6. Turn off the device.

8.3.3.5.7. Lift corner of Mylar paper.

8.3.3.5.8. Dust prints shall be properly packaged and sealed so the impression is not easily wiped away or diminished, for example tape the lift in a pizza type box with the dust impression side up so that nothing is touching the impression.

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8.4. FIRE SCENES

8.4.1. Introduction

Fire scenes are unique in the amount of destruction that may be present. Items readily identifiable as evidence under normal circumstances may be totally or partially destroyed by fire or by extinguishing the fire. The Crime Scene Investigator (CSI) shall be mindful of improvised explosive devices/booby traps and hazardous materials at crime scenes.

8.4.2. Procedure

- 8.4.2.1. The CSI shall work with a trained fire investigator, e.g., the Indiana Department of Homeland Security's Fire Investigations Section, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), and local fire departments. The CSI shall assist the investigation with documentation and evidence recovery expertise in crimes such as homicide, burglary, or other crimes that may be connected to a fire.
- 8.4.2.2. When an improvised explosive device is suspected, or materials associated with the manufacturing of explosive devices, the Indiana State Police Explosive Ordnance Disposal (EOD) Unit, ATF, or Federal Bureau of Investigation (FBI) shall be contacted.
- 8.4.2.3. The scene shall be rendered safe prior to proceeding with the examination of the crime scene.
- 8.4.2.4. General chemical materials may be toxic, poisonous, or caustic and may be dangerous in a liquid, gas, or solid form. Assume that any unknown chemical material is hazardous and make personal safety the highest priority.
- 8.4.2.5. Any hazardous or unknown chemical that has the potential for becoming hazardous and needs to be collected at a crime scene, collection should be performed by someone that specializes in hazardous materials, such as a Clandestine Laboratory Team or a Hazmat Team.
- 8.4.2.6. Scene documentation shall include, but not limited to, burn patterns, areas of origin, ignitable materials, valuables including heirlooms, or locations where these items reportedly had been prior to the fire/explosion, appliances, fire-setting mechanisms, layering, toolmarks, trace evidence, any deceased individuals, and spectators.
- 8.4.2.7. Photographs taken while the fire was in progress should be considered as potential evidence.
- 8.4.2.8. Suspected ignitable materials shall be collected in an unused fire debris collection can. Suspected ignitable/flammable liquids shall be collected in glass vials. Refer to the [Ignitable Liquids PEB #005](#).
- 8.4.2.9. Samples shall be collected from each area of origin. Place each sample in a separate labeled container. Wipe the equipment and tools clean with a disposable towel between collection of each sample.
- 8.4.2.10. Always attempt to obtain comparison samples of any liquids that could have been used as an accelerant. Consider obtaining control samples of unburned carpets, upholstery, drapes, etc., as they may contribute to the residues detected in laboratory results.

8.4.3. References

- 8.4.3.1. [Physical Evidence Bulletin 005 Ignitable Liquids](#)

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8.5. BOTANICAL EVIDENCE

8.5.1. Introduction

Botanical evidence typically involves small, often incomplete fragments of leaves, woody and non-woody fibers, needles, grass, stems, thorns, weeds, flowers, seeds, pollen, and spores which are found as associative evidence on or in clothing, vehicles, and soil. Plants tend to cluster by type depending on the environment of the site. Locard's exchange principle asserts that an assailant will take plant evidence from an outdoor crime scene.

A Forensic Botanist may be able link an assailant to a crime scene, determine the original site of a scene, describe the plant life of an unknown crime scene, locate burial sites, track pathways, and estimate time since burial.

8.5.2. Procedure

- 8.5.2.1. If botanical evidence is suspected of being on clothing or embedded in shoe soles, do not attempt to remove.
 - 8.5.2.1.1. Handle the clothing so the fragments are not lost or transferred to other items.
 - 8.5.2.1.2. Package each article in paper separately.
 - 8.5.2.1.3. Do not vacuum botanical evidence.
- 8.5.2.2. Suspects may damage vegetation on the way into and out of a crime scene. Physical matches may be made with torn or broken plants.
- 8.5.2.3. Pieces of plant material caught on or under vehicles should be carefully removed and packaged in breathable containers.
- 8.5.2.4. Collect standard samples from botanical sources observed along suspected pathways leading to and from a crime scene. Collect whole plants if possible, including seeds, leaves, roots, etc. Press live plants in a large book.
- 8.5.2.5. To collect small vegetation along a path, obtain a clean bath towel or blanket of similar size and drag it through the pathway along the ground. Small seeds, thorns, etc. will adhere to the fabric material. Package in a suitable container.
- 8.5.2.6. Photograph plants and trees in the area of the scene. Take close-ups of nuts, twigs, leaves, and buds.
- 8.5.2.7. The Indiana State Police Laboratory Division does not perform botanical examinations. Therefore, when necessary, botanical evidence should be submitted to a forensic laboratory or expert specializing in this type of evidence.

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8.6. SOIL EVIDENCE

8.6.1. Introduction

Soil consists of loose aggregates of rock, mineral, and botanical substances. Due to its tendency to adhere to most materials, soil is commonly present on physical evidence.

8.6.2. Procedure

- 8.6.2.1.** Examine clothing or other materials for soil stains, smears, or clumps of soil.
- 8.6.2.2.** Clumps of soil may be found under vehicles, on the exterior or inside vehicles.
- 8.6.2.3.** Tools and weapons may have soil adhering to them. Tools with soil shall be protected to avoid loss or contamination of the questioned soil. The area containing the soil shall be covered and protected.
- 8.6.2.4.** Do not vacuum soil evidence.
- 8.6.2.5.** If the soil is moist or wet upon collection, it should be completely air dried prior to packaging. Containers shall be sealed to ensure no leakage occurs.
- 8.6.2.6.** To collect standard soil samples, use a suitable tool to scrape about four tablespoons of soil from a surface area of about 6 inches by 6 inches into a container. Wipe the equipment and tools clean with a disposable towel between collection of each sample. Do not scrape below $\frac{1}{2}$ inch except when there is indication that the questioned sample may have come from a deeper layer of soil.
- 8.6.2.7.** When there is footwear impression evidence at a crime scene, collect a sample directly from it after all photographs have been taken. If the impression is to be cast, collect a soil sample adjacent to the cast.
- 8.6.2.8.** Additional soil samples should be collected from locations where events may have taken place for possible crime scene reconstruction purposes.
- 8.6.2.9.** The Indiana State Police Laboratory Division does not perform soil examinations. Therefore, when necessary, soil evidence should be submitted to a forensic laboratory or expert specializing in this type of evidence.

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9. FIREARMS EVIDENCE

9.1. FIREARMS

9.1.1. Introduction

Firearms evidence may be used to reconstruct the circumstances of the crime and corroborating accounts of the crime by witnesses, suspects, and victims. Firearms evidence may be useful in relating different crime scenes and connecting suspects to crimes.

Firearms evidence is not limited to only one crime category and may be found associated with different types of crime. Firearms evidence includes guns, gunpowder residue, cartridge components, or even the damage caused by the discharge of a firearm. The recovery of firearms evidence may involve specialized handling techniques due to the presence of biological, trace, latent impression evidence and the environment in which the firearms evidence was located.

9.1.2. Procedure

- 9.1.2.1. The Crime Scene Investigator (CSI) shall document all firearm locations and conditions found (hammer position, safety position, action open/closed, etc.), shell and cartridge, cartridge cases, bullet holes, bullets and fragments, and gunshot patterns through photography, sketching and/or notes. Photographs shall include the headstamps of cartridges and cartridge cases as well as the serial numbers of firearms.
- 9.1.2.2. When a firearm is moved prior to CSI's arrival, a note in the [Field Guide and Notes](#) shall be made as to its reported original position, along with the name of the individual who reportedly moved it, reason moved, and the name of the individual providing the information.
- 9.1.2.3. The CSI shall handle the firearms found at a scene in such a way that minimizes the loss of biological, trace, or latent impression evidence.
- 9.1.2.4. If the deceased is holding the firearms, the grip and position of the firearms in the hand shall be documented before recovery of the firearm.
- 9.1.2.5. If the firearm is a revolver, the position of the cylinder in relation to the barrel and cartridge cases/cartridges cases shall be documented.
- 9.1.2.6. The firearm shall be rendered safe ensuring no live rounds are chambered, removing all ammunition and, when possible, placing a zip tie through the action of the firearm. If a firearm cannot be made safe, contact a firearms examiner at the Indiana State Police Regional Laboratory for direction, prior to submission.
- 9.1.2.7. The firearm should be packaged in a heavy rigid container (gun box). Secure the firearm to the box utilizing zip ties. "UNLOADED" shall be written on the exterior of the package.
- 9.1.2.8. Record in the [Field Guide and Notes](#) the type of ammunition, number of cartridges and cartridge cases in the firearm.
- 9.1.2.9. All cartridges may be placed in a secured container and placed inside the package with the firearm.

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- 9.1.2.10. If a firearm is recovered from water, mud, etc., it should be submitted in a container with the same water, mud, etc. from the same environment. Do not clean, rinse, or wipe guns before submitting to the laboratory.
- 9.1.2.11. Projectiles and cartridge cases shall be handled with care to avoid damaging the microscopic striations/impressions on the item.
- 9.1.2.12. Each ammunition component should be packaged and sealed separately in a pillbox with tissue or soft material. The CSI, due to the possibility of damaging the evidence, shall not make markings on ammunition components.
- 9.1.2.13. Plastic or glass airtight containers shall never be used for projectiles or cartridge cases. Moisture could cause corrosion on the projectile and/or cartridge cases.
- 9.1.2.14. Cartridges found in a removable magazine may be left in the magazine and may be submitted in the same evidence container as the firearm from which it was removed.
- 9.1.2.15. Projectiles should be recovered by removing adjacent material to prevent damage.
- 9.1.2.16. Cartridges, if relatively few, should be packaged in the same manner as projectiles and cartridge cases. Larger quantities may be grouped together by location of recovery and may be listed as a single item.
- 9.1.2.17. The CSI shall attempt to locate shot shell components. The recovery of shot shell components should be handled exactly as projectiles and cartridge cases.
- 9.1.2.18. Clothing recovered for the purpose of muzzle to target distance determination shall be air dried prior to packaging in paper.
- 9.1.2.18.1. The clothing should be individually packaged in clean paper, sealed, and individually marked for identification.
- 9.1.2.19. Consider recovering any cartridges and cartridge cases associated with the case as potential standards for use at the laboratory.

9.1.3. References

- 9.1.3.1. [Physical Evidence Bulletin \(PEB\) 11 Firearms](#)

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9.2. TOOLMARKS

9.2.1. Introduction

A toolmark is any impression, scratch, gouge, cut, or abrasion made when a tool is brought into contact with another object. Impressions may be left, for example, in wood, metal, plastic, putty, paint, doorknobs, locks, latches, wire, chains, windowsills or doorsills, striker plates, and cash drawers. Tools that may leave identifiable marks include screwdrivers, pry bars, pliers, cutters, chisels, knives, axes, hammers, drill bits, or other items. Toolmark evidence may be present at various types of crime scene, from burglary to homicide.

9.2.2. Procedure

- 9.2.2.1. Evaluation for toolmarks should be made at points of entry, or attempted points of entry, and accesses or attempts to access made to interior rooms and areas or items of interest.
- 9.2.2.2. Any broken, forced, or cut locks, latches, bolts, and any cut wire should be evaluated for toolmark evidence.
- 9.2.2.3. Cut wires shall have the ends to be examined differentiated from the cut ends created by the CSI.
- 9.2.2.4. Sketches are useful for depicting the position of all toolmarks to include a fixed reference point(s), and the height from the floor or ground.
- 9.2.2.5. Toolmarks should be evaluated for any trace evidence, such as paint transfers, hair, or fibers, prior to examining for latent impressions or casting. Trace evidence may be both removed and packaged separately.
- 9.2.2.6. Toolmarks shall be photographed for orientation purposes prior to casting or removal.
- 9.2.2.7. It is preferable to remove and submit the entire object, containing the toolmark, to the laboratory for comparison when possible. If this is not possible, cast impressions of the toolmark should be obtained.
- 9.2.2.8. Mikrosil™ or other similar casting material of a darker color should be used when collection impressions of the toolmark. However, light color can be used when a darker color is unavailable.
- 9.2.2.9. Toolmark evidence shall be handled and packaged in such a manner as to guard against any contact between a hard object or surface, and the mark itself, to avoid potential loss of trace evidence or damage to the potential microscopic striations.
- 9.2.2.10. Samples of paint or metal from the original item should be obtained and submitted as reference standards because trace evidence may adhere to the suspect tool.
- 9.2.2.11. When a suspect tool is recovered, it shall never be fitted into the impression to see if it could have made the mark.
- 9.2.2.12. The suspect tool shall be packaged as to avoid damage or lose trace evidence. Never clean a tool.
- 9.2.2.13. Consider that fingerprint examination and/or DNA analysis may be needed on a suspect tool.

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9.2.2.14. Immobilize the tool to reduce contact with packaging material.

9.2.3. References

9.2.3.1. [Physical Evidence Bulletin \(PEB\) 13 Toolmark](#)

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9.3. Shooting Incident Documentation

9.3.1. Introduction

The documentation of the shooting incident is critical in the evaluation of the scene. A shooting incident scene must be properly documented with photographs, notes, and measurements consistent with requirements noted in this manual. A Crime Scene Investigator (CSI) must successfully complete a Laboratory Division approved course on shooting incident reconstruction.

9.3.2. Procedure

- 9.3.2.1. When a shooting scene is examined, the evidence located may assist with the reconstruction of the events. It is preferable for the shooting incident reconstructionist to examine the original scene; however, examination may be performed from a well-documented scene. The CSI shall evaluate the probative value of measuring every projectile hole. When there is no additional probative value to measuring additional holes, the CSI shall obtain supervisor approval to deviate from hole measurements and/or trajectory analysis. The supervisor's approval shall be documented in the CSI's notes.
- 9.3.2.2. The CSI shall document a shooting scene with a combination of notes, diagrams, and photographs. The locations of projectile defects, holes, bullets, and cartridge cases shall be documented with measurements to fixed positions.
 - 9.3.2.2.1. When projectile holes are present, the CSI should include a description of the holes in the case report. Example: I observed an elliptical shaped hole with a pinch point on the left edge. The edges of the hole were pushed inward towards the interior of the vehicle.
 - 9.3.2.2.2. If a positive chemical test for copper and/or lead is obtained by the CSI the presumed bullet strike, the CSI may refer to that bullet strike as being a "bullet strike" in notes and his/her report. Results of chemical testing should also be included in the report.
- 9.3.2.3. The location of cartridge cases could possibly assist with the approximate range, position, and orientation of the firearm at the moment of discharge.
- 9.3.2.4. The number of shots could be determined and possibly the sequence of shots in glass.
- 9.3.2.5. Structures, vehicles, interior and exterior surfaces, the ground, and other surrounding objects shall be examined for projectile impacts.
- 9.3.2.6. The shape of a projectile defect may be used to determine the angle of impact and assist in an area of origin determination. When possible, trajectory rods shall be placed through projectile holes to visually demonstrate the flight path of the projectile through an object. When trajectory rods cannot be used but the hole is well defined, it shall be photographed with a scale and be measured for length (major axis) and width (minor axis) so it may be used to determine the area of origin.
- 9.3.2.7. The following shall be documented: the location of the hole(s) used to establish the trajectory, the horizontal angle (azimuth), and the vertical angle (inclination). The horizontal angle is measured at the scene with the use of a zero-edge protractor, a level, and a plumb bob with attached line. The vertical angle is measured with an inclinometer or a zero-edge protractor. Photographs shall be taken at a 90-degree

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angle of the protractor, the horizontal, and at a 90-degree angle of the inclinometer for the vertical angle. If a FARO laser scanner with accompanying trajectory spheres is utilized, hand measurements are not required.

- 9.3.2.8. Trajectory rods or laser pointers may assist in documenting the path of a projectile. A minimum of two defects from the same projectile are required to determine a trajectory on thin substrates. The use of trajectory rods may also assist in locating missing projectiles.
- 9.3.2.9. Photographs shall be taken when using trajectory rods, protractors, or other tools to measure horizontal and vertical angles of the path of a projectile.
- 9.3.2.10. Assigning labels to evidence is recommended to assist with a reconstruction. Examples: "I-1", "I-2", "I-3", for Impacts, "C-1", "C-2", "C-3", for Cartridge Cases, "Hole 1", (Hole 1A, Hole 1B, Hole 1C), for projectile holes.
- 9.3.2.11. Technical photographs of impact areas and projectile holes shall be taken with a scale.
- 9.3.2.12. The CSI should consider collecting any clothing that may have probative value to the shooting investigation.
- 9.3.2.13. The CSI shall state no opinions or issue a written report stating conclusions, unless the CSI has successfully completed at least one Laboratory Division approved shooting incident reconstruction (SIR) course and successfully completed a presentation before a panel. The CSI must then be authorized by the Laboratory Division Commander to give opinions and issue written reports stating conclusions related to SIR. See Section 9.4.2.4 for the complete process for authorization.

9.3.3. References

- 9.3.3.1. Shooting Incident Reconstruction, Second Edition, Michael G. Haag and Lucien C. Haag

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9.4. Shooting Incident Reconstruction

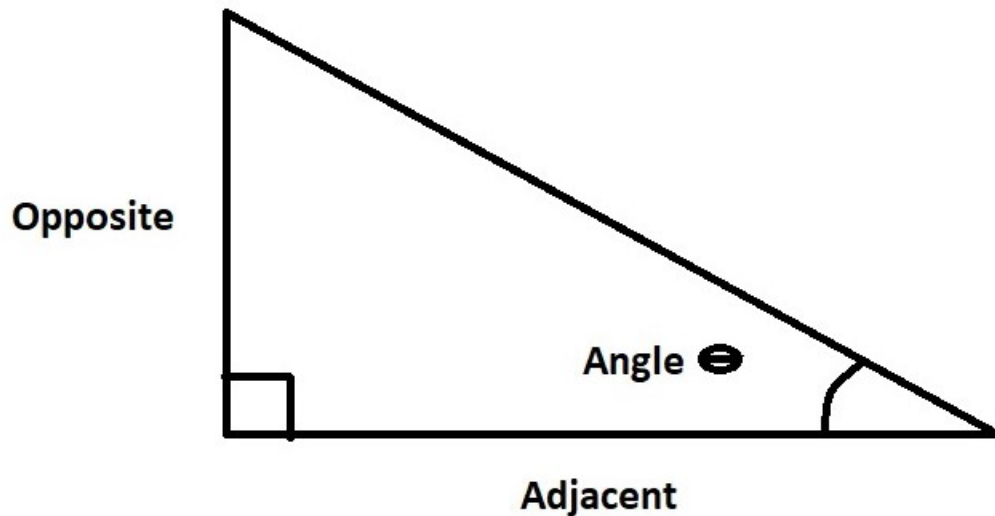
9.4.1. Introduction

Shooting incident reconstruction is using the physical evidence at a crime scene to determine: the range, position, and orientation of a firearm when discharged; the position and orientation of the victim at impact; the number and possible order of shots; the effect of the projectile striking an intervening material. In order to be a Shooting Incident Reconstructionist, the Crime Scene Investigator (CSI) must complete the procedures listed below.

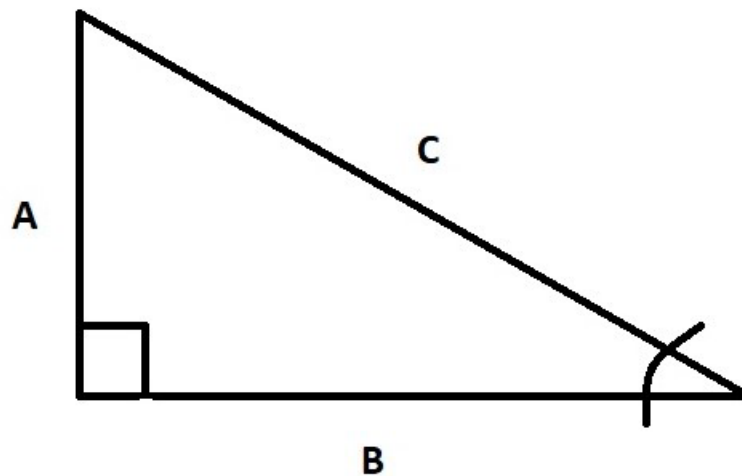
9.4.2. Procedure

- 9.4.2.1. For a CSI to be considered a shooting incident reconstructionist (SIR), they must have successfully completed a Laboratory Division approved shooting incident reconstruction course.
- 9.4.2.2. After the completion of the course, a competency test shall be administered by the ISP Laboratory Division.
- 9.4.2.3. Any SIR report should be technically reviewed by another qualified shooting reconstructionist prior to the Case Report being approved in the Record Management System (RMS).
- 9.4.2.4. No CSI shall state opinions, or issue a written report stating conclusion, unless that CSI has successfully completed a Laboratory Division approved Shooting Incident Reconstruction course, a competency test, successfully completed a presentation before a panel, and has been authorized by the Laboratory Division Commander.
- 9.4.2.5. A combined BPA/SIR kit is issued to every CSI. The supplied equipment shall be used to document and collect the information needed for a reconstruction.
- 9.4.2.6. The following shall be documented: the location of the hole(s) used to establish the trajectory, the horizontal angle, and the vertical angle. The horizontal angle is measured at the scene with the use of a zero-edge protractor, a level, and a plumb bob with attached line. The vertical angle is measured with an angle finder or a zero-edge protractor. Photographs shall be taken at a 90-degree angle of the protractor, both horizontal and vertical angles. If a FARO laser scanner with accompanying trajectory spheres is utilized, hand measurements are not required.
- 9.4.2.7. Mathematics may also be used to determine the angle of impact. A measurement of the width and length of the hole should be done. $\text{Angle of impact} = \text{Sin}^{-1}[\text{width of hole (W)}/\text{length of hole (L)}]$. If the hole is not well defined on one side, a half measurement may be taken and then doubled for an estimated total length. Not all holes are suitable for measurements.
- 9.4.2.8. The Tangent method may also be used to determine heights, distances, or impact angles. If the angle of impact and one side of a right triangle are known, then the other side of the triangle may be calculated. $\text{Tangent of angle } \theta = \text{opposite}/\text{adjacent}$.
 $\text{Tan}^{-1} = \theta$.

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- 9.4.2.9. The Pythagorean Theorem relates to the length of the sides of a Right Triangle. The squaring of baselines may be used in estimating distances when some measurements can be obtained at the scene. $A^2 + B^2 = C^2$ where side C is the length of the Hypotenuse and side A and side B are the lengths of the other two sides.



- 9.4.2.10. The primary purpose of a reconstruction is to determine the area of origin for shot or shots. When the evidence at a scene is clear, the area of origin may be relatively small. If the evidence is not as clear, the area of origin could be more general. Any angles reported shall show a plus or minus of 5 degrees (5^0) from the *Shooting Incident Reconstruction*, Second Edition, by Michael G. Haag and Lucien C. Haag.
- 9.4.2.11. Each of the Crime Scene Investigations Supervisors is issued a Bullet Hole Examination Kit. These kits are set up to test for the presence of lead and copper. In the absence of other firearms related evidence [i.e., firearms, cartridge case(s), bullet(s), etc.] or reports of gunfire, these kits should be used to test apparent bullet wipes. Positive tests should be photographed and collected as evidence.

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9.4.3. References

9.4.3.1. Shooting Incident Reconstruction, Second Edition, Michael G. Haag and Lucien C. Haag

9.4.3.2. SIR Terminology List

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10. DRUGS EVIDENCE

10.1. DRUGS AND CLANDESTINE LABORATORIES

10.1.1. Introduction

Drugs are frequent physical evidence in a wide variety of criminal cases. Controlled substances appear in a variety of forms: liquids, tablets, capsules, powders, plant material, and invisible deposits on paper when examining crime scenes. Drugs may be illicit (e.g., LSD), or legal (e.g., Vicodin), and may be controlled or non-controlled.

Crime scenes shall be routinely evaluated for drug evidence that may include paraphernalia and evidence of drug dealing. When requested, the Crime Scene Investigator (CSI) shall assist the Indiana State Police Clandestine Laboratory Enforcement Team with examining scenes.

Clandestine laboratories and illegally manufactured controlled substances normally have little or no quality control program. Flammable liquids and explosive compounds may be used in the manufacturing process, as well as carcinogenic substances. Clandestine laboratories may be “booby-trapped” with mechanical and/or chemical devices. The chemical wastes produced are an environmental concern and biohazards that are consistent with intravenous drug use may be present.

Clandestine laboratories may involve various manufacturing procedures. Methamphetamine being the most common, but cocaine base, PCP (phencyclidine), LSD (lysergic acid diethylamide), and explosive manufacturing may be encountered as well. Common chemicals found at methamphetamine lab are pseudoephedrine, muriatic acid, anhydrous ammonia, and sodium dichromate.

There is a potential serious safety threat to the CSI at clandestine laboratories. Additionally, proper disposal of waste product is required for compliance with Federal and State environmental laws. Improper disposal may lead to severe penalties for the investigating agency.

10.1.2. Procedure

- 10.1.2.1.** When searching a dwelling, the investigation should be done in a systematic manner. In addition to hidden contraband, the CSI should be alert for intelligence information such as telephone numbers, address books, pieces of paper, sums of money, and possible stolen property.
- 10.1.2.2.** Drug paraphernalia can be in a variety of forms. If it is necessary to collect syringes or a syringe with a needle, a puncture-proof container shall be used for packaging such as a specially designed syringe tube with protective Styrofoam ends.
- 10.1.2.3.** Water should be removed from water pipes prior to packaging.
- 10.1.2.4.** Orientation photographs shall be taken of the drug evidence prior to recovery.
- 10.1.2.5.** Never sniff or taste drug evidence. Never handle suspected drug evidence without appropriate personal protective equipment (PPE).

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- 10.1.2.6. Live marijuana plants shall be photographed, leaves stripped from the plants and the stripped material allowed to dry. The dried plant material shall be packaged in paper bags or cardboard boxes.
- 10.1.2.7. Drug evidence shall be packaged separately to prevent cross-contamination. For specific instructions, [ISP Physical Evidence Bulletin PEB-01](#) or [PEB-019](#) shall be followed.
 - 10.1.2.7.1. When safe to do so, CSI's should consider packaging drug material separately from the container in which it is found to allow the containers to be submitted for latent print or DNA analysis.
- 10.1.2.8. Consider looking for booby-traps, carbon dioxide tanks, fertilizers, timers, lighting equipment, irrigation systems, and "how to" publications.
- 10.1.2.9. Drug field test kits allow CSIs in the field to perform presumptive tests of suspected drugs.
 - 10.1.2.9.1. Field test on unknown powder substances should be avoided unless absolutely necessary.
 - 10.1.2.9.2. When a presumptive field test is performed, the results shall be included in the CSI Case Report.
 - 10.1.2.9.3. Submit the substance from which field-tested samples originated to a Regional Laboratory for confirmation.
 - 10.1.2.9.4. When a presumptive field test is performed, the results should be photographed.
- 10.1.2.10. Once it is determined that a possible clandestine laboratory is present, all personnel shall immediately exit the area. The Indiana State Police Clandestine Laboratory Enforcement Team shall be contacted for all suspected clandestine laboratory investigations.
- 10.1.2.11. The CSI shall enter the scene only when authorized by the Clan Lab Team leader.
- 10.1.2.12. When entry is approved, CSI shall document the scene with photography. Sketching and video recording may be used.

10.1.3. References

- 10.1.3.1. [Physical Evidence Bulletin \(PEB\) 1 Drugs](#)
- 10.1.3.2. [Physical Evidence Bulletin \(PEB\) 19 Clandestine Drug Laboratory](#)
- 10.1.3.3. [Special Laboratory Bulletin 2017-01 General Precautions for Dangerous Drugs](#)

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11. DOCUMENT EVIDENCE

11.1. DOCUMENTS

11.1.1. Introduction

Written and typed documents occur in many facets of today's society. Writings may occur on paper such as letters and notes, and may be present on desks, tabletops, walls, floors, doors, and even on bodies. Typed documents may be machine reproduced, computer generated, or typed using a typewriter. Examples of questioned documents include, but not limited to, robbery or demand notes, threatening letters, suicide notes, checks, credit card receipts, counterfeit documents, currency, torn and cut paper, altered and/or obliterated documents, photocopies, forged signatures, forged documents, and blank notepads or documents.

When investigating crimes involving forensic documents, the forensic document evidence shall be properly handled and preserved. Excessive handling may damage the document and smudge or obscure important writing characteristics, which may preclude any possibility of identification and/or eliminate latent impressions. Improper handling may also damage indented writing.

Successful examination of documents of questionable origin or for authenticity begins with obtaining proper handwriting exemplars from suspects or known standards for comparison with the questioned or disputed writing. Also, the known samples shall be comparable, and the questioned writing conditions shall be approximated. If a suspect wrote with chalk on a ceiling rafter, exemplars on paper likely would not be sufficient for comparison. Additionally, the known specimens must be adequate so that normal handwriting variations may be examined.

The most often raised objection to the use of handwriting standards for comparison purposes is that it violates the privilege against self-incrimination. This argument is not applicable since the purpose of handwriting standards is identification. The summation of case law on the matter is that written words used as a handwriting sample and not for their meaning communicates nothing about the knowledge of a crime. Thus, words may be used as physical evidence, apart from their communicative content.

11.1.2. Procedure

- 11.1.2.1.** Questioned documents are often fragile evidence and need to be handled accordingly.
- 11.1.2.2.** Questioned documents shall be packaged separately.
- 11.1.2.3.** Label evidence packaging prior to placing evidence into package.
- 11.1.2.4.** Indicate "Do Not Fold/Bend" on the packaging.
- 11.1.2.5.** Never fold, staple, or bend questioned documents.
- 11.1.2.6.** Standard writings need to be collected for comparison to the questioned document.
- 11.1.2.7.** If the document is written in cursive, then the known standard shall also be written in cursive. Likewise, if the questioned document is printed then the known standard shall be printed.
- 11.1.2.8.** If connecting different crimes is desired and known standards are not available, consult with the Forensic Document Unit at the Indianapolis Regional Laboratory.

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- 11.1.2.9. The known standard may come from numerous sources, including but not limited to, personal checks, credit card statements, forensic document forms, account books, affidavits, job applications, assignments, autographs, and additional sources as identified by the Forensic Document Unit.
- 11.1.2.10. Known standards need to be adequate in quantity. Two or three sentences likely will not be enough for a comparison with several pages of questioned documents.
- 11.1.2.11. Use the exemplar forms to collect known writing and following in the instructions in [Physical Evidence Bulletin \(PEB\) 16 Documents](#).
- 11.1.2.12. Original documents are preferred when possible. Photocopies may be used but the quality must be suitable for comparison.
- 11.1.2.13. In instances where the questioned document needs be evaluated for latent impression or other evidence, the CSI shall indicate on the Request for Laboratory Examination Form. Care should be taken to protect documents for latent impression examination.
- 11.1.2.14. Indented writing standards shall be collected when possible, For example, notebook or paper under questioned document.
- 11.1.2.15. Care should be taken to protect charred documents. A sturdy container is required.
- 11.1.2.16. When collecting envelopes, indicate on the Request for Laboratory Examination Form if biological testing is needed.

11.1.3. References

- 11.1.3.1. [Physical Evidence Bulletin \(PEB\) 16 Documents](#)

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12. HUMAN BODY

12.1. AUTOPSY

12.1.1. Introduction

Autopsies are typically performed by a forensic pathologist. In addition to determining an official cause and manner of death, the forensic pathologist may assist the investigation by determining the type of weapon, whether the wounds were consistent with investigative evidence, and which wound was the fatal wound. Additionally, the forensic pathologist may determine how long the victim could have lived after the assault, if the body was dragged or moved, the direction of force, and/or the position of the victim at the time of the attack, if wounds were ante-mortem or post-mortem, whether there was evidence of sexual assault, if there were projectiles present, and whether there was evidence of struggle. A non-forensic pathologist is not normally trained to make determinations as listed above.

12.1.2. Safety

12.1.2.1. All autopsy investigations shall be treated as a biohazard scene.

12.1.2.2. Personal protective equipment (PPE) shall be considered at all autopsies

12.1.3. Procedure

12.1.3.1. If necessary, hold and secure the crime scene until the autopsy is completed. Sometimes information learned at the autopsy will lead to a secondary examination of the scene.

12.1.3.2. The coroner of venue is the authority as to decide whether an autopsy will be performed. The CSI shall request all questionable deaths be autopsied, preferably by a Forensic Pathologist.

12.1.3.3. The CSI shall ensure communication is established and maintained with the coroner of venue and the forensic pathologists within their coverage area.

12.1.3.4. The CSI should request a detective who is familiar with the investigation, as well as the coroner, to attend the autopsy.

12.1.3.5. If an autopsy is to be performed, the body shall be placed in a new body bag and sealed with a pre-numbered security tag. The security tag number shall be documented with photography and in Field Guide and Notes. The seal will protect the transporting emergency medical technician (EMT) or coroner from being a part of the chain of custody and give integrity to the evidence collected from the body.

12.1.3.6. At the autopsy, the pre-numbered security tag shall be inspected and photographed prior to the body bag being opened.

12.1.3.7. All individuals present at the autopsy shall be documented by the CSI and the autopsy section of the [Field Guide and Notes](#) shall be completed.

12.1.3.8. The CSI shall brief the coroner and/or forensic pathologist on the facts of the case prior to the autopsy, (e.g., body positioning, livor/rigor mortis, insect activity, medications, ligatures, firearms, weapons, and witness statements). The forensic pathologist may be shown scene photographs, and other documentation (i.e., sketches). Physical evidence from the scene shall not be turned over to or

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handled by the forensic pathologist if it is brought into the autopsy room for observation.

- 12.1.3.9. The CSI shall discuss taking X-rays of the body prior to the autopsy and request when necessary.
- 12.1.3.10. The autopsy and the identity of the deceased shall be thoroughly documented.
 - 12.1.3.10.1. The CSI shall ensure that the body is photographed during the autopsy.
 - 12.1.3.10.2. Photography documentation should include, but not limited to, both sides of the hands, damaged clothing, bloodstain patterns, technical photographs of wounds with and without scale, foreign objects removed from the body, x-rays, tattoos, and any artifacts recovered from the body.
 - 12.1.3.10.3. Autopsies shall not be video recorded.
- 12.1.3.11. The CSI shall coordinate with the forensic pathologist to obtain all desired evidence from the autopsy. Evidence recovery is essential before interment.
- 12.1.3.12. Notations shall be made of rigor/livor mortis, stomach content, ante-mortem and post-mortem artifacts, wounds, tattoos, clothing, and valuables. In the event evidence or property is recovered from a body at a time other than during the autopsy, the evidence shall be documented and the coroner of jurisdiction shall be notified
- 12.1.3.13. The CSI shall ensure toxicology samples are collected by the forensic pathologist or coroner and submitted for toxicological examination. When blood is available, the CSI shall also collect a grey-top vial and maintain for secondary toxicology testing if needed.
- 12.1.3.14. The CSI shall collect, at a minimum, a purple-top vial, stain card, or swabs of the decedent's blood for DNA analysis. In a case in which a body is so decomposed that no blood is available, an approximate six-inch section of rib or femur bone may be collected. Teeth and hair with roots are also good sources of DNA to collect.
- 12.1.3.15. Postmortem fingerprints shall be collected at all autopsies, unless all digits are obliterated by fire, decomposition, or other trauma. Infant fingerprints are optional. Methods include, but not limited to, inked impressions, black powder with white tape on a transparency sheet, macro photography, and casting material. A set of Major Case Prints should be considered for future investigative purposes.
- 12.1.3.16. Collect clothing with suspected gunshot residue and from around the wound on skin.
- 12.1.3.17. Package all bullets, shot pellets, and wadding separately. Do not mark projectiles. Rinse blood from projectiles prior to packaging. Do not collect projectiles with a metal instrument.
- 12.1.3.18. Projectiles should be removed with rubber-tipped or plastic forceps or using the fingers to prevent damage. Bloody or tissue covered projectiles should be rinsed off using running water only and not scrubbed. Projectiles removed from an individual should be placed in a box prior to packaging to prevent damage to the projectile surface.

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- 12.1.3.19.** Fingernails are a possible source for suspect DNA. Visually examine for blood or skin under the nails, and for broken fingernails. Use sterile fingernail clippers to collect the nails, or scrape the material from under the nails with a clean scalpel, wooden applicator, or toothpicks, by holding paper bindles under the fingers. Broken nails should be removed for puzzle matching.
- 12.1.3.20.** The CSI shall examine the victim for any potential trace evidence. Any unknown foreign material shall be collected, e.g., hair, fibers, plant material, glass, animal hair, residues, dirt, etc.
- 12.1.3.21.** When a possible sexual assault has occurred, CSI's should request a sexual assault kit be collected. In addition, the CSI should consider obtaining swabs from the decedent's orifices as well as locations a suspect may have fondled or licked (i.e., breasts, neck, lips, ears, inner thighs, feet, or any other exposed area).
- 12.1.3.22.** Autopsies involving the possibility of struggle, an alternate light source (ALS) should be utilized for wound visibility enhancement, evaluating for trace evidence, body fluids, and latent impressions. Procedure for operation of ALS is in [Section 14.1](#).
- 12.1.3.23.** The CSI should consider assisting the lead investigator in obtaining a preliminary autopsy report from the forensic pathologist, as to the cause and manner of death, as well as opinions on the type of firearms used, bullet trajectories, if the firearms wound is contact-type, and approximate time of death.
- 12.1.3.24.** When non-evidentiary valuables exist, (e.g., wallet, money, or jewelry), they shall be photographed and documented in the Field Guide and Notes, to include who the items were retained by. The CSI may also collect these items for safekeeping, if necessary.

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12.2. SKELETAL REMAINS

12.2.1. Introduction

The Crime Scene Investigator (CSI) may be involved in locating, collecting, preserving, and documenting evidence from bodies and human remains at a crime scene. Skeletal remains may consist of a single bone, the entire body, or any variation in between. A forensic anthropologist may assist in the recovery process and may conduct an examination of the remains. Skeletal remains may be used to determine age, sex, race, height, and other individual characteristics, as well as assisting in the determination of cause of death. Proper recovery technique is imperative to ensure that all potential information may be determined. Irreversible damage may result if the remains are improperly exhumed.

12.2.2. Safety

Skeletal remains crime scenes shall be considered biohazard and personal protective equipment (PPE) shall be worn during the recovery process.

12.2.3. Procedure

- 12.2.3.1. The CSI shall ensure that a forensic anthropologist has been contacted, upon learning that a possible skeletal remains scene is encountered.
- 12.2.3.2. The forensic anthropologist shall complete the exhumation and collection of skeletal remains unless the forensic anthropologist directs the CSI otherwise. The CSI shall document in the [Field Guide and Notes](#) all specific instructions received from the forensic anthropologist.
- 12.2.3.3. The CSI should assist the investigating officer with coordinating efforts between pathologist, coroner, forensic anthropologist, the prosecuting attorney, and/or other agencies before and during body examination.
 - 12.2.3.3.1. The CSI shall become the liaison with the coroner of venue in order to ensure cooperation at a skeletal remains crime scene and follow-up examination of the remains.
 - 12.2.3.3.2. The CSI shall evaluate the need to produce X-ray, medical, and/or dental records for identification.
- 12.2.3.4. The CSI should consider, depending on the circumstances, the use of cadaver dogs, search teams, and underground/underwater detection equipment.
- 12.2.3.5. Visual clues may lead to clandestine graves.
 - 12.2.3.5.1. The CSI should initially scan the landscape to discern common or baseline features of the topography and aid in the identification of irregularities.
 - 12.2.3.5.2. These irregularities may consist of broken ground, fresh surface soil, sunken soil, unusual plant locations, disruption of root balls, and/or burial depressions.
 - 12.2.3.5.3. Inconsistencies with the environment such as tire tracks, garbage, animal burrows, clumps of hair or fibers, etc.
- 12.2.3.6. Prior to recovery of the remains, the CSI shall ensure that the scene is documented using photography and sketching, and may utilize videography, if useful.

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- 12.2.3.6.1. Take overall, medium range, and close up photographs.
- 12.2.3.6.2. In remote areas, the CSI should collect GPS coordinates of skeletal remain location.
- 12.2.3.6.3. Document measurements from two or more reference points at the scene of the body.
- 12.2.3.6.4. When the forensic anthropologist generates documentation, the CSI should consider assisting the lead investigator in obtaining a copy of the information. The anthropologist's diagram can be used in lieu of completing a separate diagram.
- 12.2.3.7. Bindings and ligatures shall not to be disturbed unless it attaches the body to the scene.
 - 12.2.3.7.1. Minimize the number of cuts necessary and document the cuts.
 - 12.2.3.7.2. The CSI shall label ends of ligatures or bindings that were cut.
- 12.2.3.8. Entomological activity shall be evaluated, see [Section 12.3](#).
- 12.2.3.9. Botanical activity should be evaluated, see [Section 8.5](#).
- 12.2.3.10. The metal detector should be utilized in searching the scene, after the exhumation, including the area directly under the remains, see [Section 14.2](#).

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12.3. ENTOMOLOGY

12.3.1. Introduction

Forensic entomology is the study and application of insects to criminal matters. With proper collection of entomological evidence, a forensic entomologist may be able to calculate the time of infestation, which could be used to estimate a time of death, whether or not a body has been moved, and other forensically significant information. Conclusions often may be drawn by noting the state of successive colonization of a corpse by local arthropod fauna or by identifying the developmental stage of dead-flesh eating insects collected in, on, or near the body. The time required for insects to undergo their life cycle development is determined largely by the temperature and relative humidity associated with those species present in a particular environment. The life cycle and stages of insect maturity assists the Forensic Entomologist in determining the time and possible location of the victim's death.

12.3.2. Safety

12.3.2.1. Entomology crime scenes are considered a biohazard.

12.3.2.2. Personal protective equipment (PPE) shall be worn.

12.3.3. Procedure

12.3.3.1. The Crime Scene Investigator (CSI) shall evaluate the entomological activity at a scene.

12.3.3.2. A forensic entomologist should be contacted as soon as possible after learning of the existence of entomological evidence to provide specific guidance to the CSI, especially in the area of climate data collection.

12.3.3.3. The CSI shall become the liaison with the coroner of venue in order to ensure cooperation at a crime scene where entomological evidence exists.

12.3.3.4. Prior to recovery of entomological evidence, the CSI shall document the scene using notes, photography, sketching, and may use video recording.

12.3.3.4.1. Documentation should include site description, general observations, insect activity, vegetation description, time, weather conditions, and status of body including clothed, nude, buried, placed in an enclosure, injuries, and state of decomposition.

12.3.3.4.2. The CSI should document the weather conditions through the National Weather Service, including temperature and wind speed and direction, at the time of recovery, as well as several hours or days prior to the collection.

12.3.3.5. Directions and collection supplies are provided in the CSI entomology kit. Kits should contain the following:

12.3.3.5.1. Written directions;

12.3.3.5.2. Documentation forms;

12.3.3.5.3. Insect "kill" jar;

12.3.3.5.4. Collection vials;

12.3.3.5.5. Tweezers;

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- 12.3.3.5.6. Plastic containers;
- 12.3.3.5.7. Labels;
- 12.3.3.5.8. Pencil for labeling (ink will run);
- 12.3.3.5.9. Ethyl alcohol; and
- 12.3.3.5.10. CSI should obtain fresh liver, hamburger or canned tuna for live specimens when needed.

12.3.3.6. Collect each obviously different insect using the following procedure:

12.3.3.6.1. Approximately one-half of the available living organisms that are obviously similar shall be handled as one item for each separate group.

12.3.3.6.1.1. Each item containing living insects shall be placed on top of raw liver, raw hamburger, or canned tuna, which will be placed into a Styrofoam cup.

12.3.3.6.1.2. A lid shall be placed onto each cup, with each lid having small holes placed in it in order to allow air transfer.

12.3.3.6.1.3. These items shall be maintained at room temperature until transferred to the forensic entomologist.

12.3.3.6.1.4. The CSI shall record the time of the kill and collection in the [Field Guide and Notes](#).

12.3.3.6.2. The remaining half of the living organisms that are similar shall be handled as one item for each separate group and killed by placing them into a bottle filled with ethyl alcohol.

12.3.3.6.3. The CSI shall record the time of collection in the [Field Guide and Notes](#).

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13. DIGITAL EVIDENCE

13.1. DIGITAL EVIDENCE AND ELECTRONIC MEDIA

13.1.1. Introduction

Evidence of criminal activity may be found on computers and digital devices. Digital evidence may be involved in a wide variety of criminal cases. Therefore, the Crime Scene Investigator (CSI) needs to properly recover potential digital evidence.

13.1.2. Procedure

13.1.2.1. Personal protective gear should be properly worn when considering the possibility of latent print and/or DNA evidence.

13.1.2.2. When practical, the CSI should consider consulting with the Indiana State Police Cyber Crime Unit (CCU) prior to arriving at the scene.

13.1.2.3. The CSI shall ensure legal considerations prior to the recovery of electronic evidence. To determine whether an individual has a reasonable expectation of privacy of information stored in a computer or other device, treat the computer or device like a closed container such as a briefcase or file cabinet. The Fourth Amendment generally prohibits law enforcement from accessing and viewing information stored without a warrant. The contents of a computer or an electronic device are not in plain view.

13.1.2.4. Crime scenes in general shall be routinely evaluated for presence of digital and electronic evidence, which may include cell phones, tablets, laptops/notebooks, desktop computer (including all-in-one and Apple iMac), digital cameras, memory cards, USB thumb drives or flash drives, CD/DVD/Blu-ray, hard drives (internal and external), disks (floppy 3.5” or 5.25”), gaming consoles (e.g. Nintendo DS, PlayStation, and Xbox), global positioning systems (GPS), vehicle GPS components, printers, removable storage media, copiers, credit card skimmers, access control devices (security keys or swipe cards), surveillance systems, iPods, MP3 players, smartwatches, networking equipment, servers, etc.

13.1.2.4.1. CSI's should document any visible information on monitors, cell phone home screens, landline telephones, or other electronic devices that are readily visible.

13.1.2.5. The seizure of computers and digital media follows the same general principle as other evidence, with some additional considerations:

13.1.2.5.1. For stand-alone computers, if the computer is off, leave it off.

13.1.2.5.2. If the computer is turned-on, document and photograph/video what is on the screen, (“wake up” the system by moving the mouse if there is a screen saver running). Prior to unplugging, the CSI should ensure that the computer is not performing any disk encryption. The CSI shall document all activity they have made to a computer. In addition, this information must be shared with CCU. If the CSI is unsure if the device is encrypted, contact CCU before powering off the computer.

DETERMINING IF A COMPUTER IS DISK ENCRYPTED

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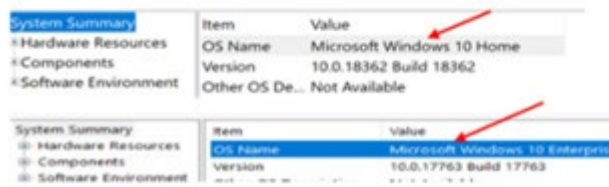
Unlocked Windows Computer

Check the version of your Windows operating system

Click on the **Start Menu** at the bottom left hand corner of the screen:



In the **Type here to search** box, type "system information" and click on the **System Information** tab to display the version of Windows used on your device:



Check if your device is encrypted (Windows 10 Home edition)

Click on the **Start Menu** at the bottom left hand corner of the screen:

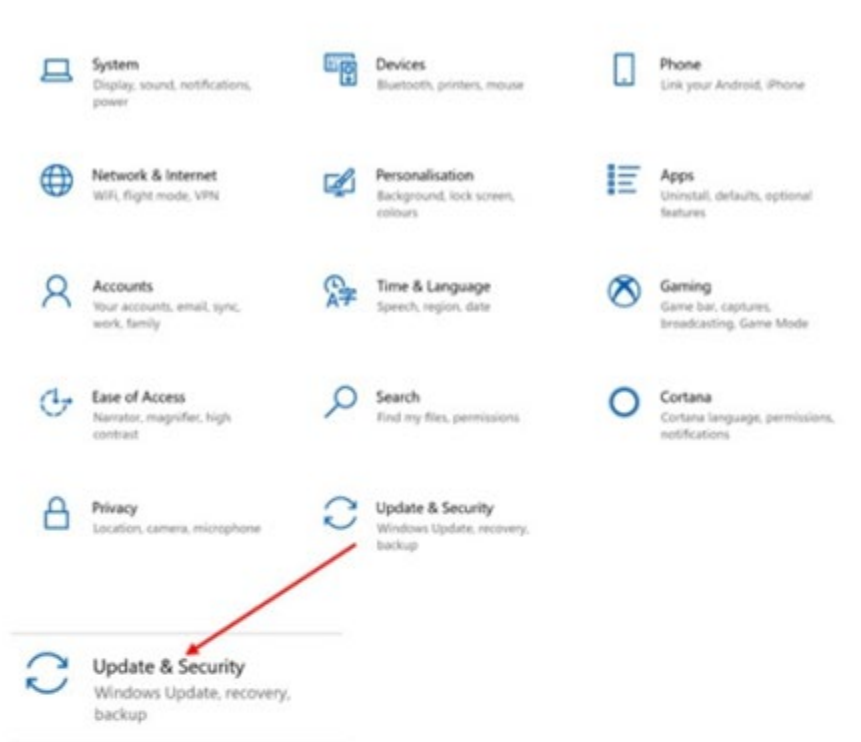


Click on the Settings cogwheel icon:

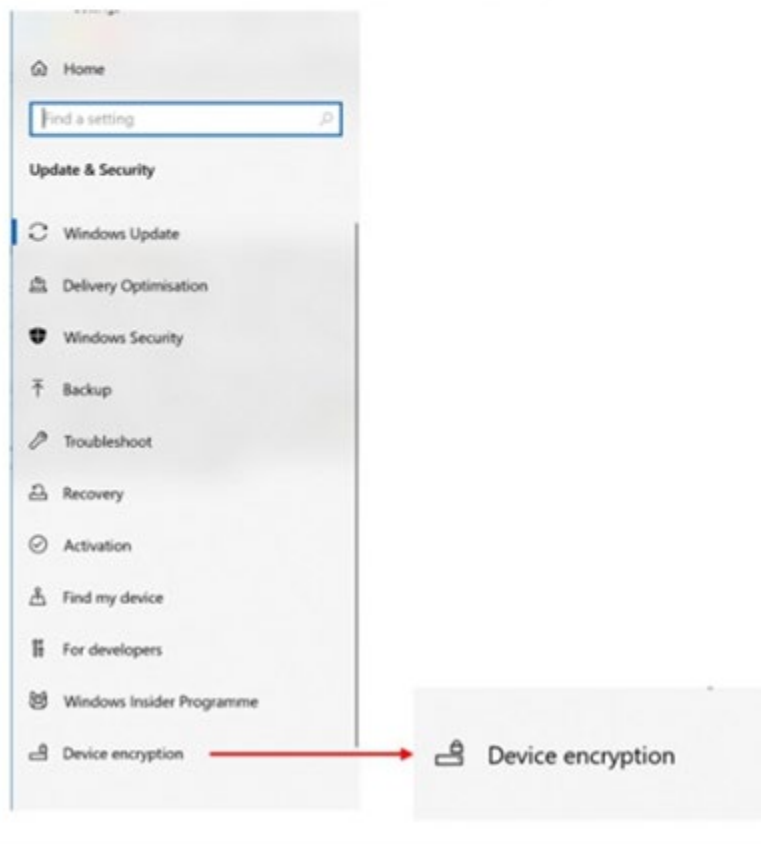


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Click on **Update & Security**:



In the left-hand column Click on **Device encryption**:



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If you see the message **Device encryption is on** with the option to **Turn off**, your hard drive **IS** encrypted:

Device encryption helps protect your files and folders from unauthorised access in case your device is lost or stolen.

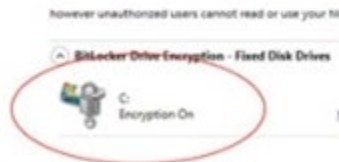


Check if your device is encrypted (Windows 10 Pro/Enterprise/Education editions)

In Windows Explorer in the left hand column, click on **This PC** and on the right hand side you should see a padlock icon on the drives that are encrypted.



Highlight and right-click on the drive you want to verify the "BitLocker Options". If you see the message **Encryption on**, your hard drive **IS** encrypted:



If your drive does not have the padlock icon, it is **NOT** encrypted.



Unlocked macOS Computer

macOS laptops

FileVault 2 is available on macOS Lion or later.

Check the version of your macOS operating system

Click on the Apple icon on the top left-hand corner of the screen:



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Click on **About This Mac** to display information about the macOS version:



Check if your macOS disk is encrypted

Click on **System Preferences** and then on the **Security and Privacy** icon:



If you see the message **FileVault is turned on for the disk "Macintosh HD"** with the option to **Turn off FileVault**, this means that your disk **IS** encrypted:



If you see the message "Filevault is turned off...", this means that your disk is **NOT** encrypted.

- 13.1.2.5.3. Remove the power plug from the back of the computer, not at the wall outlet. It is highly recommended the CSI collect the power cord for any desktop (including iMac, all-in-one) or laptop computers.
- 13.1.2.5.4. If the computer is a laptop, remove the battery. If the battery cannot be removed, hold the power button down until the computer turns off. Collect the power cord.
- 13.1.2.5.5. Photograph the perimeter of the computer showing everything connected to it including close-ups.
- 13.1.2.5.6. Document the make, model, and serial number on the computer. For some laptop computers, the make, model, and serial number may be found in the battery compartment.
- 13.1.2.5.7. Label the plug-in cords as to which port each one plugs into.
- 13.1.2.5.8. If the computer is a network computer in a business system, do not unplug the computer; request the CCU or a specialist who is familiar with the system.
- 13.1.2.5.9. When seizing other electronic devices (tablets, cameras, cell phones, hard drives, etc.) it shall be packaged as any other evidence.
- 13.1.2.5.10. If the device has a power cable or a cable to connect it to a computer, also seize the cables with the device.

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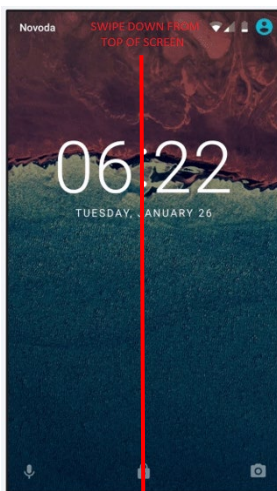
13.1.2.6. Attempt to locate device passwords, swipe patterns, or unlock codes.

13.1.2.7. When seizing cell phones, place phone in “airplane” mode and turn off the WiFi and Bluetooth. The CSI must document any changes made to a mobile device in a case report. In addition, the CSI must inform CCU of any changes made to the mobile device. Leave the cell phone, tablet, or media player powered on. If the device supports a SIM card, remove it without powering off the device. Tape the SIM to the back of the phone, so as not to lose it. If the device does not have a SIM or SIM cannot be removed without powering off the device, wrap the device in three (3) layers of aluminum foil or place inside a metal can so as to remove it from the cellular network. Mobile devices wrapped in aluminum foil or stored in metal cans will likely not stay powered on long.

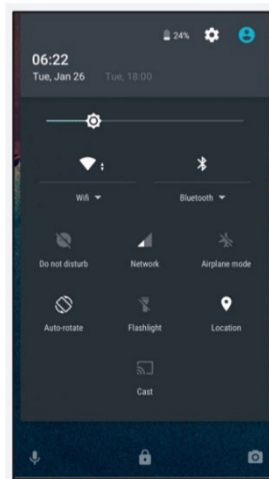
It is very important to keep the mobile device powered on and charged in a secure location until it can be submitted to CCU for an examination. If the mobile device is a key piece of evidence, contact CCU immediately for guidance on making it a priority examination.

SECURING ANDROID DEVICES

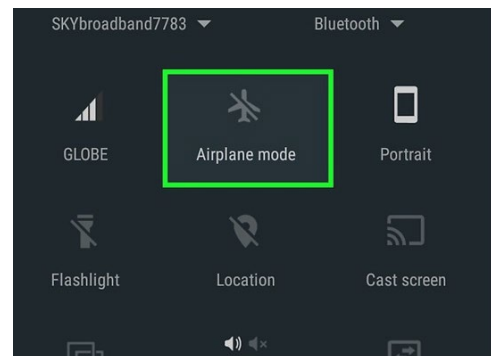
Airplane Mode from the Quick Access/Notifications Bar



Step 1

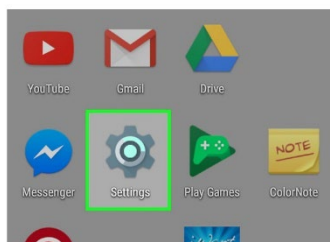


Step 2

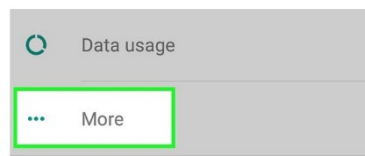


Step 3

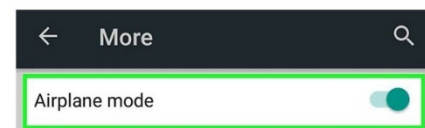
Accessing Airplane Mode from Settings



Step 1



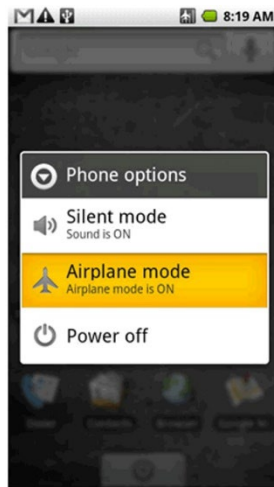
Step 2



Step 3

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Accessing Airplane Mode by Holding Power Button



SECURING APPLE DEVICES (iOS versions 7 to 11)

Swipe from the Bottom and Activate from Control Center



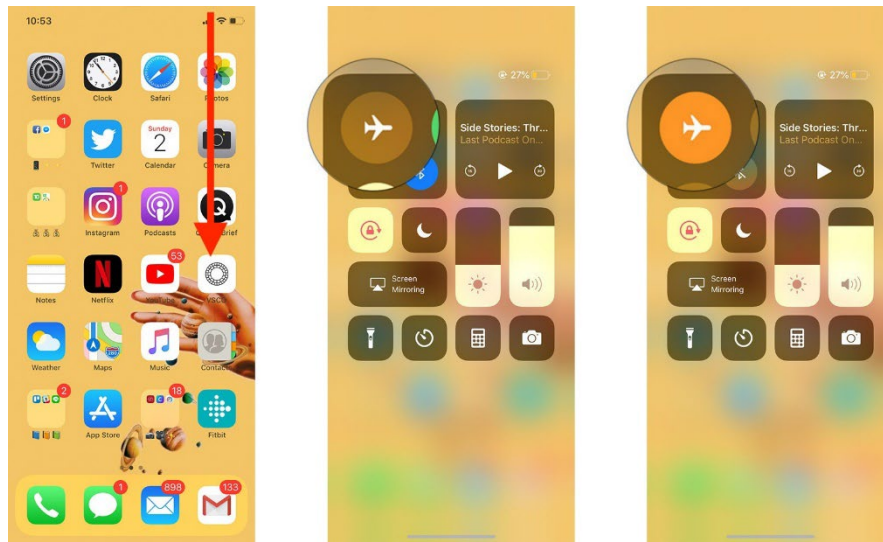
Launch Settings from Home Screen and Toggle Airplane Mode Switch



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SECURING APPLE DEVICES (iOS versions 12 and newer)

Swipe from top Right Corner of Screen and Activate from Control Center



Launch Settings from Home Screen and Toggle Airplane Mode Switch



- 13.1.2.7.1. If the cell phone is not examined at the time of the seizure and was not turned on, package it in an evidence bag.
- 13.1.2.7.2. If cell phone is wet or contains moisture, do not use a plastic bag. Package in paper and contact CCU for additional guidance.
- 13.1.2.8. Consider seizing all software and hardware manuals. These are often helpful to the investigating officer for reference. Also, consider seizing or photograph notes, scribbling, and notebooks that may have reference to software passwords and other computer accounts the suspect uses.
- 13.1.2.9. The CSI shall carefully transport digital evidence to avoid excessive bouncing and jarring. If possible, package magnetic media (e.g., Cassette tapes, floppy discs and magnetic strip credit cards, CD, and VCR tape) in anti-static bags. Keep electronic media away from magnets, radio equipment, speaker magnets, etc., during transportation and storage. Keep the equipment protected from moisture and excess dust.

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13.1.2.9.1. If available, cell phones shall be plugged in, stored in a Temporary Digital Evidence Storage Locker, and a cell phone examiner and investigating officer shall be notified of its location.

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14. ADDITIONAL CRIME SCENE TECHNIQUES

14.1. ALTERNATE LIGHT SOURCE

14.1.1. Introduction

The Alternate Light Source (ALS) may allow the Crime Scene Investigator (CSI) to evaluate for the presence of saliva, semen, urine, latent impressions treated with fluorescent fingerprint powder, and trace material such as fibers.

14.1.2. Procedure

- 14.1.2.1. The ALS uses specific wavelengths of light and requires the use of a filter(s) for observation and photography. An ALS is usually used in conjunction with a red, orange, or yellow filtered goggles and filters for the camera lens. Using a tripod for camera stability is essential when photographing.
- 14.1.2.2. Observing shall always be done through the viewing shield or goggles to filter out unwanted wavelengths of light.
- 14.1.2.3. The CSI shall be aware of people around the area and caution them about the potential injuries to the eyes that may result from the light source.
- 14.1.2.4. The ALS should be used in as dark conditions as possible. Any additional light may cause the results to be diminished.
- 14.1.2.5. Scan a room or suspected area with the ALS.
- 14.1.2.6. The ALS may be used in any type of investigation and on any type of surface, whether indoor or outdoor, including deceased and living individuals.
- 14.1.2.7. Generally, treated latent impressions with fluorescent powders are brighter than body fluid stains. Usually, semen will fluoresce as the brightest body fluid, followed by urine, and then saliva. Blood does not fluoresce when using an ALS. The light waves are absorbed and will appear black.
- 14.1.2.8. False positives are possible with fluorescent agents. CSIs shall consider false positives that may include rust, bleach, oils, and certain detergents.
- 14.1.2.9. Any bodily fluid stains, located with the ALS, shall be photographed before recovery.
- 14.1.2.10. The prints or stains shall be photographed through the viewing shield or through a camera lens filter.
- 14.1.2.11. The ALS may also be utilized when searching for trace evidence since many fibers will fluoresce.
- 14.1.2.12. The ALS lenses shall be kept clean and treated with the same care afforded camera lens.

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14.2. METAL DETECTOR

14.2.1. Introduction

In addition to a visual exam, a metal detector may be used to assist in the search for metallic items of evidence including: weapons, bullets, cartridge cases, cartridges, and/or cartridge components.

14.2.2. Procedure

- 14.2.2.1. The metal detector should routinely be used in crime scene searches where there is potential metallic evidence present. This will normally be an outdoor scene, where evidence may be below the surface or is difficult to see.
- 14.2.2.2. Refer to the user's manual for operation of the metal detector being used. A copy of the manual should be maintained in the Crime Scene Investigator's (CSI) vehicle or on a network drive.
- 14.2.2.3. Prior to use at a scene, the CSI shall test the metal detector by placing a metallic object on the ground and passing the device over the object.
 - 14.2.2.3.1. An audible "beep" sound indicates the device is working properly. The CSI shall document in the [Field Guide and Notes](#) that the metal detector was function tested and working properly.
 - 14.2.2.3.2. If the metal detector does not produce the audible "beep" sound or is otherwise not performing properly, the device shall not be used at the scene and shall be removed from service until repaired.
- 14.2.2.4. The search pattern(s) used will vary, depending on the topography of the scene. The area should be divided into grids of manageable sections, and each section searched using either Strip or Spiral Method.
 - 14.2.2.4.1. When using the Strip Method, divide the area to be searched into one-yard wide strips. Sequentially search the entire area one strip at a time. Then, adjust the search pattern ninety degrees and repeat.
 - 14.2.2.4.2. When using the Spiral Method, begin in the center of the area to be searched. Then sweep the area while walking in a circle of continuously increasing diameter and continue until the entire area has been searched.
- 14.2.2.5. The metal detector shall be cleaned and/or dried after each use. Also, the batteries shall be removed, as they will corrode if left inside the metal detector.
- 14.2.2.6. In situations where metallic objects may be located in a body of water, the CSI should consider contacting the Indiana State Police Underwater Search and Rescue Team for assistance.

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14.3. REAGENTS

14.3.1. Introduction

There are a number of blood detection and enhancement reagents for use by Crime Scene Investigators (CSI). These include but are not limited to, Luminol, Leuco Crystal Violet, and Hemastix, which are useful in the detection of trace amounts of blood at a crime scene. The use of these reagents are at the discretion of the CSI dependent upon the circumstances at a crime scene. Consideration shall be given prior to the use of these techniques if DNA analysis may be conducted, as these reagents may inhibit the DNA analysis.

Typically, blood enhancement techniques are conducted after all on-scene documentation is complete, as an investigative tool that may assist in determining areas of possible blood staining that warrant further examination. These reagents may give false positives, which is why it is considered a presumptive test.

Positive/negative controls as well as the use of any reagent at a crime scene shall be documented in the [Field Guide and Notes](#), regardless of the results. Do not use the reagents if the positive or negative control test fail.

14.3.2. Luminol

14.3.2.1. Introduction

Luminol reagent is useful in examining large areas for detecting blood, particularly if there is suspected clean-up, or faint staining is not easily visible, or on a dark colored substrate.

14.3.2.2. Procedure

- 14.3.2.2.1. False positive reactions may occur with vegetable matter, bleach and detergents, cigarette smoke, metals, or copper.
- 14.3.2.2.2. Prepare the reagent solution by adding the powdered or tablet contents to distilled water in a plastic bottle, as instructed on the manufacturer's label.
 - 14.3.2.2.2.1. Mix the powder and water with a swirling action, (versus shaking), until dissolved.
 - 14.3.2.2.2.2. Then transfer the solution into a fine mist spray bottle.
 - 14.3.2.2.2.3. Any undissolved powder should not be transferred into the spray bottle to avoid clogging.
 - 14.3.2.2.2.4. The solution should be used within approximately 30 minutes.
- 14.3.2.2.3. A positive and negative control shall be tested prior to use and documented in the Field Guide and Notes. The positive control is a blood sample that will give a blue-green luminescent light and negative control shall have no reaction. The reagent shall not be used if either the positive or negative control fails.
- 14.3.2.2.4. The lighting in the area where the reagent will be used should be dark as possible, covering windows if necessary. In darkened conditions, these reagents react with blood resulting in a blue-green luminescent light. Before spraying, let eyes adjust to the darkness, otherwise a positive reaction may be difficult to see. Have an evidence marking pen ready to circle stains so they may be located for documentation and to collect samples.

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- 14.3.2.2.5. Spray a fine mist of the reagent solution in a sweeping motion over the area of interest. A presumptive positive reaction to blood will luminesce for approximately 30 seconds, and then will begin to fade. Avoid over-spraying and saturation of the area.
- 14.3.2.2.6. When a reaction occurs, it shall be documented by sketching, measuring, and consider photography. Refer to the Photography [Section 4.1](#) for instructions to photograph Luminol.
- 14.3.2.2.7. Spraying Luminol on pattern evidence such as footwear impressions, will negatively affect the pattern evidence by dissolving and diluting it.
- 14.3.2.2.8. False positive reactions may occur with vegetable matter, bleach and detergents, cigarette smoke, metals, and copper. Reactions with these items compared to blood, are shorter in duration and less intense.
- 14.3.2.2.9. Samples should be collected from areas of luminescence for purposes of DNA testing and crime scene reconstruction.

14.3.3. Hemastix

14.3.3.1. Introduction

Hemastix is a presumptive test for the presence of blood. Confirmatory testing must be performed at the laboratory for conclusive identification. **Procedure**

- 14.3.3.1.1. Hemastix is a very sensitive test for blood. However the CSI should be mindful of false-positives.
- 14.3.3.1.2. Hemastix positive and negative control tests shall be conducted prior to testing questioned blood stains and be documented in the Field Guide and Notes. Photographs of the controls should also be considered.
- 14.3.3.1.3. A positive result will result in a green color. A weak positive result will show faint, slow-developing green color. A negative control results in no reaction.
- 14.3.3.1.4. For questioned stains, moisten the cotton tip of a swab with distilled water. Swab a small portion of the suspected blood stain, enough to see it on the cotton tip.
- 14.3.3.1.5. Rub the stained swab directly on the pad of the Hemastix. The development of a green color indicates the possible presence of blood. The results shall be documented in the Field Guide and Notes and should be documented with photography.
- 14.3.3.1.6. The only stains that should be tested in the field are those where additional stains are available for collection and submission to a Regional Laboratory for DNA testing.

14.3.4. LEUCO CRYSTAL VIOLET

14.3.4.1. Introduction

Leuco Crystal Violet (LCV) is useful for examining large areas of crime scenes to enhance and develop faint or latent bloody impressions. LCV is NOT to be used for DNA purposes. Each has a fixative in its formula, may be quickly sprayed on any surface, providing visualization of blood almost immediately. It reacts with blood turning a purple/violet/blue

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color. Therefore, if the substrate is dark colored, the purple/violet/blue reaction may not provide good contrast.

14.3.4.2. Procedure

- 14.3.4.2.1. This reagent is useful for enhancing footwear, fingerprint, or pattern evidence, along with drag marks, wipes/swipes, and attempted clean-ups of crimes scenes.
- 14.3.4.2.2. It may be utilized on porous or non-porous surfaces, under any lighting conditions.
- 14.3.4.2.3. Similar to Hemastix, the reagent will give false-positive reactions to certain plant materials, metals, and bleach.
- 14.3.4.2.4. LCV requires mixing of components prior to being utilized for scene examination. It may be obtained from a Regional Laboratory as needed. However, LCV has a long shelf-life and may be carried in the CSI vehicle.
- 14.3.4.2.5. The reagent may be detrimental to yielding DNA results after usage, but is not clear as to what size of stain is appropriate for a successful DNA profile. The larger the stain the greater likelihood.
- 14.3.4.2.6. Positive and negative controls shall be conducted prior to usage and documented in the Field Guide and Notes.
- 14.3.4.2.7. Spray the surface/items of evidence/areas of interest with a fine mist sprayer. Development should occur within seconds.
- 14.3.4.2.8. After a non-porous surface has been sprayed and there is a positive reaction of violet/blue, it may be rinsed with distilled water to remove excess chemical for better clarity of an impression/pattern. The same pattern may be examined and rinsed, which may possibly further enhance the developed impression.
- 14.3.4.2.9. Document the results with photography, sketching, and in the Field Guide and Notes.

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15. DOCUMENTATION

15.1. CRIME SCENE AND EVIDENCE DOCUMENTATION

15.1.1. Introduction

Crime scene documentation is extremely important to provide a detailed record of observations, assist with testimony, and allow for independent review by other experts. This includes crime scene notes, case report narratives, sketches, photographs, [CSI Field Guide and Notes](#), [Property Record and Receipt Form \(PR&R\)](#), and [Request for Laboratory Examination Form](#).

The Crime Scene Investigator (CSI), for each investigation shall complete the following forms:

- a) [Crime Scene Investigator Field Guide and Notes](#) ;
- b) [Records Management System \(RMS\) Case Report](#); and
- c) [PR&R Form](#), when evidence was recovered

15.1.2. CSI Field Guide and Notes

- 15.1.2.1. Contemporaneous note taking is an essential component of a crime scene investigation, the quality and completeness of which is often critical to a comprehensive examination of a crime scene.
- 15.1.2.2. The CSI shall generate contemporaneous notes for each crime scene. The CSI Field Guide and Notes Form may be utilized for this purpose. Each investigation shall include the appropriate page from the Field Guide and Notes as the first page, followed by other notes generated by the CSI. The other pages of the form are optional.
- 15.1.2.3. Note taking is an ongoing and continuous description of the crime scene. It should be inclusive of the crime scene from the time the CSI is notified to finish examining the scene, noting the “who, what, when, where, why, and how.” These notes shall be contemporaneous, in that the notes are taken at or near the time the examinations are completed.
- 15.1.2.4. Nothing is too insignificant to record if it catches the attention of the CSI. It is better to generate too much detail, rather than too little detail.
- 15.1.2.5. Include descriptors of environmental conditions including weather, lighting conditions, temperatures, odors, the position, and condition of evidence or items, etc.
- 15.1.2.6. Use photographs and sketches to supplement the notes and make additional notes later.
- 15.1.2.7. The notes shall be sufficient and adequate, containing all the results of examinations and observations, as well as the findings and results to refresh the CSI’s memory in the future. The notes shall contain sufficient detail of the examination so that another CSI could review the documentation, evaluate, and interpret what was done.
- 15.1.2.8. The notes are not expected to be a stand-alone report.
- 15.1.2.9. All pages of notes and sketches shall have the initials of the CSI that prepared them, along with the case number of the investigation.

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- 15.1.2.10. All notes shall be retained, and all Field Guide and Notes, additional notes, and sketches, shall be uploaded into CSI/Archives within 30 days of the initial scene.
- 15.1.2.11. The CSI may later transcribe hand-written notes onto the computerized version of the CSI Field Guide and Notes for clarity purposes. However, the original hand-written notes shall also be uploaded on the CSI archive.
- 15.1.2.12. The [CSI Field Guide and Notes](#) shall be completed for all investigations by every CSI that completes a forensic task at each scene.
- 15.1.2.13. The [Field Guide and Notes](#) shall reflect each examination performed.
- 15.1.2.14. If another CSI completed a forensic task, the lead CSI shall indicate on the Field Guide and Notes who completed the examination or task.
- 15.1.2.15. The CSI's notes may be written on or attached to the [Field Guide and Notes](#) and shall be maintained by the CSI in accordance with [Laboratory Crime Scene Investigations Policy #002 and uploaded into CSI/Archives within 30 days of initial scene](#).
- 15.1.2.16. When a CSI creates a sketch, it may be depicted on the diagram portion of the [Field Guide and Notes](#), or it may be an attachment.
- 15.1.2.17. The [Field Guide and Notes](#) and any attached pages shall each be initialed and include the case number at a minimum.

15.1.3. Case Report Narratives

- 15.1.3.1. Information gathered from the CSI's notes, sketches, photographs, and videos from the crime scene investigation, shall be used to compose a complete case report narrative, with the following information included:
- 15.1.3.2. Date and time of response, the agency that requested services, the address of the scene, the type of investigation, and names of officials and agencies assisting.
- 15.1.3.3. Write to the target audience, which includes judges, attorneys and the jury. Proofread the report when completed. Others will read the report and evaluate the performed work based upon it.
- 15.1.3.4. Use past tense only.
- 15.1.3.5. Use first-person only, using "I" and "we".
- 15.1.3.6. Let the audience know the legal right to be at the scene, i.e., search warrant or consent to search.
- 15.1.3.7. In paragraph form, describe the scene and observations of evidence in a logical and sequential manner, examinations that were performed, brief description of evidence collected, description of chemical tests utilized including results, conclusions (when applicable), and disposition of evidence collected.
- 15.1.3.8. When using terms not common to the lay person (i.e., MikrosilTM, Dental Stone, ALS, AFIS, CODIS, Luminol, Hemastix, etc.) a description and explanations should accompany the term (i.e., I utilize a casting material know as Dental Stone to preserve the footwear impression for examination).
- 15.1.3.9. When describing a deceased person include a physical description with a clothing description, generic description of injuries, location, and positioning of the body.

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- 15.1.3.10. Do not leave the reader hanging. For example, if writing about a death investigation and not mention the outcome of the autopsy. Another example would be writing about examining for latent fingerprints and not mention if prints were recovered.
 - 15.1.3.11. Use disclaimers such as “I observed a dried reddish stain” or “what appeared to be blood, or hair or fiber or glass or paint”. Use care in describing colors as they may change, for example use “reddish”, “blueish”, “greenish” instead.
 - 15.1.3.12. Unless authorized by the Division Commander in Bloodstain Pattern Analysis, the CSI shall refrain from giving an opinion when reporting on bloodstain evidence as to how the bloodstain pattern(s) was created. However, the CSI should describe the approximate number of stains, the range of stain sizes, the shapes of the stains, the overall size of the pattern, and the location of the pattern. (i.e., The stains were in a linear pattern. The stains toward the ends of the pattern were elliptical, while the stains in the center of the pattern were more circular.)
 - 15.1.3.13. Techniques shall be avoided in the narrative but shall be included in the personal notes (e.g., “Examined for latent fingerprints”, rather than “utilized conventional black powder” or “photographed”, rather than “took overall, medium and close up photographs”).
 - 15.1.3.14. Do not include glove changes. Exceptions to this would be a trained Firearms Liaison documenting the processing of a firearm in the field.
 - 15.1.3.15. Give no description of autopsy protocol. Preliminary findings of manner and cause of death and general descriptions of wounds/injuries shall be in agreement with the Forensic Pathologist.
 - 15.1.3.16. Refer to the Indiana State Police (ISP) [Physical Evidence Bulletins \(PEBs\)](#) for correct terminology, e.g., firearms evidence, “cartridge” or “cartridge case”.
 - 15.1.3.17. Supplemental narrative reports shall be created when additional evaluation of evidence is performed, or additional scenes are examined, after the initial narrative has been submitted.
 - 15.1.3.18. Report content shall be accurate, clear, concise, and grammatically correct with no spelling errors. The report shall not include acronyms, jargon, and opinions other than those of expert witnesses.
- 15.1.4. [Property Record and Receipt Form \(PR&R\)](#)**
- 15.1.4.1. When evidence is collected it shall be recorded on a digital [PR&R Form](#) and handwritten forms shall not be routinely accepted.
 - 15.1.4.2. Each item of evidence collected by the CSI shall be recorded, by item number, on the [PR&R Form](#).
 - 15.1.4.3. Each item shall be described on the [PR&R Form](#) from the outside, leading to the inside (e.g. “a sealed plastic bag, containing a plastic bag, containing white powdery substance”).
 - 15.1.4.4. The verbiage “sealed” shall be used unless an item cannot be packaged.
 - 15.1.4.5. Each crime scene shall have its own [PR&R Form](#).

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- 15.1.4.6. Correct mistakes on the [PR&R Form](#) by drawing one single line through the error and entering the correct alongside. The individual making the correction shall then initial the correction.
- 15.1.4.7. The Chain of Custody portion of the [PR&R Form](#) shall be completed for each transfer of each item. The date and time shall be recorded. The record shall be such that each item of evidence may be tracked, ensuring the chain-of-custody is not broken. An exception would be if the item was being tracked electronically within the Laboratory Division via the Laboratory Information Management System (LIMS).
- 15.1.4.8. The printed version of the [PR&R Form](#) shall be stored at the ISP District location where the evidence was recovered.
- 15.1.4.9. The CSI shall ensure a scanned copy of the signed [PR&R Form](#) is uploaded as an attachment in [RMS](#) within 30 days.

15.1.5. [Request for Laboratory Examination Form](#)

- 15.1.5.1. The [Request Form](#) shall be completed when an item(s) needs to be examined at an Indiana State Police Regional Laboratory. Use the most current version of the [Request for Laboratory Examination Form](#), available on the network drive.
- 15.1.5.2. Each item shall be described on the [Request Form](#) from the outside, leading to the inner most packaging (e.g. “a sealed plastic bag, containing a plastic bag, containing white powder”).
- 15.1.5.3. The wording “sealed” shall be used for each item unless an item is unable to be packaged.
- 15.1.5.4. Numerals shall be used for item numbers. Do not use alpha-characters.
- 15.1.5.5. Only those items to be examined shall be recorded on the [Request Form](#).
- 15.1.5.6. The completed [Request Form](#) shall be emailed to the appropriate District Evidence Specialist or Property Officer.
- 15.1.5.7. Do not use abbreviations or ditto marks on any [Request Form](#).
- 15.1.5.8. Suspect and victim names are included on Laboratory Division forms in order to match necessary information with department or other agency inquiries.

15.1.6. Technical Reviews

- 15.1.6.1. The Crime Scene Investigations Supervisors shall technically review one crime scene investigation for each CSI per quarter.
- 15.1.6.2. The Crime Scene Investigations Supervisors shall technically review each other’s crime scene investigations.
- 15.1.6.3. In the absence of a Crime Scene Investigations Supervisor due to vacancy or extended leave, the Crime Scene Investigations Section Commander shall assign a certified CSI or another Crime Scene Investigations Supervisor to conduct the technical reviews in that Area.
- 15.1.6.4. All bloodstain pattern analysis (BPA) cases shall be technically reviewed by currently authorized BPA CSI or Forensic Scientist.

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- 15.1.6.5. All shooting incident reconstruction (SIR) cases should be technically reviewed.
- 15.1.6.6. The technical reviewer shall complete the Technical Review Checklist, which shall be uploaded to a network drive.

15.1.7. Quality Assurance (QA) Assessment

- 15.1.7.1. Every six months, the CSI QA Unit shall conduct a QA Assessment on two cases for each CSI.
- 15.1.7.2. The reviewer shall complete a QA Assessment Checklist and the QA Assessment Log on a network drive.
- 15.1.7.3. The completed QA Assessment Checklists shall be uploaded to a network drive.

15.1.8. References

- 15.1.8.1. [Crime Scene Investigations Policy #002 Crime Scene Investigator \(CSI\) Report in the Records Management System \(RMS\)](#)

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APPENDIX 1

ABBREVIATIONS

AFIS	Automated Fingerprint Identification System
ALS	Alternate Light Source
APPROX	Approximately
BPA	Bloodstain Pattern Analysis
BRN	Brown
CAL	Caliber
CAPT	Captain
CM	Centimeter
CODIS	Combined DNA Index System
CSI	Crime Scene Investigator
CSR	Crime Scene Reconstruction
DOA	Deceased on arrival
F	Fahrenheit
FARO	Faro Laser Scanner
FT (')	Feet
F/SGT	First Sergeant
GRN	Green
GSR	Gun Shot Residue
IN (")	Inches
ISP	Indiana State Police
Lab	Laboratory
LCV	Leuco Crystal Violet
LT	Lieutenant
MM	Millimeter
N, S, E, W	North, South, East, West
NR	No Results
PC	Positive Control
PD	Police Department
PEB	Physical Evidence Bulletin
PHE	Phenolphthalein
PRR	Property Record and Receipt
SD	Sheriff's Department
SGT	Sergeant
SO	Sheriff's Office
SOP	Standard Operating Procedure
SPR	Small Particle Reagent
W/	With
W/O	With Out
Yd	Yard
(+) POS	Positive
(-) NEG	Negative

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