OSAC 2021-S-0013 Standard Guide for Post Mortem Examination Photography

Video / Image Technology & Analysis Subcommittee
Digital / Multimedia Scientific Area Committee
Organization of Scientific Area Committees (OSAC) for Forensic Science

OSAC Proposed Standard

OSAC 2021-S-0013 Standard Guide for Post Mortem Examination Photography

Prepared by
Video / Image Technology & Analysis Subcommittee
Version: 2.0
March 2022

Disclaimer:

This OSAC Proposed Standard was written by the Video/Image Technology & Analysis/Digital/ Multimedia Scientific Area Committee of the Organization of Scientific Area Committees (OSAC) for Forensic Science following a process that includes an open comment period. This Proposed Standard will be submitted to a standards developing organization and is subject to change.

There may be references in an OSAC Proposed Standard to other publications under development by OSAC. The information in the Proposed Standard, and underlying concepts and methodologies, may be used by the forensic-science community before the completion of such companion publications.

Any identification of commercial equipment, instruments, or materials in the Proposed Standard is not a recommendation or endorsement by the U.S. Government and does not imply that the equipment, instruments, or materials are necessarily the best available for the purpose.

To be placed on the OSAC Registry, certain types of standards first must be reviewed by a Scientific and Technical Review Panel (STRP). The STRP process is vital to OSAC's mission of generating and recognizing scientifically sound standards for producing and interpreting forensic science results. The STRP shall provide critical and knowledgeable reviews of draft standards or

of proposed revisions of standards previously published by standards developing organizations (SDOs) to ensure that the published methods that practitioners employ are scientifically valid, and the resulting claims are trustworthy.

The STRP panel will consist of an independent and diverse panel, including subject matter experts, human factors scientists, quality assurance personnel, and legal experts, which will be tasked with evaluating the proposed standard based on a comprehensive list of science-based criteria.

For more information about this important process, please visit our website at: https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science/scientific-technical-review-panels

1. Scope

1.1. This standard provides procedures describing specific photography and lighting techniques for documenting post mortem examinations. These photographs serve as a permanent record of the examination, related evidence, and findings.

1.2. This standard cannot replace knowledge, skills, or abilities acquired through education, training, and experience, and is to be used in conjunction with professional judgment by individuals with such discipline-specific knowledge, skills, and abilities.

1.3. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

2. Terminology

2.1. Definitions—for definitions of terms relating to this *standard*, refer to Terminologies E2916.

2.2. Definitions of Terms Specific to This *Standard*:

2.2.1. Anatomical Position - The erect position of the body with the face directed forward, the arms at the side, and the palms of the hands facing forward, used as a reference in describing the relation of body parts to one another (Dictionary.com)

2.2.2. Frankfurt Plane - The anatomical position of the human skull, based on a plane passing through the inferior margin of the left orbit and the upper margin of each ear canal.

2.2.3. Native ISO - The sensitivity (ISO) setting that does not require the camera to increase the voltage to the sensor. It is not always the lowest ISO available on the camera. (https://www.bhphotovideo.com/explora/photography/tips-and-solutions/understanding-exposure-part-4-iso accessed 05/11/2021)

2.2.4. Anterior – front of the body

2.2.5. Posterior – rear of the body

2.2.6. Documentation quality images – photographs that will be used to demonstrate the appearance of the subject, typically captured using a minimally compressed image format.

2.2.7. Examination quality images – photographs that will be used for comparison purposes or to calculate precise measurements, typically captured using the highest resolution and least compression available on the camera.

3. Summary of Practice

3.1. Universal precautions for health and safety

3.2. Suggested equipment

3.3. Camera settings

3.4. General considerations

3.5. Photographic documentation of post mortem examinations

3.6. Retention and storage of images

4. Significance and Use

4.1. This guide is intended to increase consistency among forensic photography providers due to the evidentiary and documentary value provided by photographs during forensic autopsies.

4.2. This standard provides photography guidelines to better allow organizations to develop training programs and in-practice protocols.

4.3. This guide is not intended to address all potential examination types or conditions, nor does it supersede requirements of accrediting or certifying bodies.

5. Universal Precautions for Health and Safety

5.1. Universal precautions is an approach to infection control to treat all human blood and bodily fluids as if they were known to be infectious for HIV, HBV, and other bloodborne pathogens.

5.2. Use appropriate personal protective equipment such as gloves, masks, and gowns to prevent coming into contact with blood and other bodily fluids.

6. Suggested Equipment

6.1. Single Lens Reflex (SLR) Camera or Mirrorless Interchangeable Lens Camera (MILC)

6.2. Lenses covering normal to wide angle field of view and macro capabilities

6.3. Storage media cards

6.4. Batteries

6.5. Lighting

6.5.1. Off camera Flash Unit

6.5.2. Flash sync cord or wireless trigger

6.5.3. Flash diffuser

6.5.4. Ring flash

6.5.5. Alternate Light Source (ALS)

6.5.6. Flashlight

6.6. Various scales that have been previously checked against a known standard for accuracy (e.g. L-shaped, straight, ABFO no.2, NNDV no.2); millimeters recommended.

6.7. Camera Support

6.7.1. Tripod

6.7.2. Articulating support

6.7.3. Copy stand

6.8. Step Stool/ Ladder

6.9. Background material

6.9.1. Neutral background for gross specimen photography

6.9.2. Movable neutral background for overall or orientation photographs

6.9.3. Cloths / towels / drapes

6.10. Case identifier / labels

6.11. Color reference target

7. Camera Settings

7.1. Set the correct date and time.

7.2. Format memory card.

7.3. Use Manual exposure mode.

7.4. Use an aperture that yields sufficient depth of field.

7.5. Use the fastest flash sync speed.

7.6. Set the white balance to “Flash”.

7.7. Use the camera’s native ISO, to ensure the best color, contrast, saturation, and minimize artifacts from noise.

7.8. Choose a focus setting that allows single point focusing.

7.9. Use the external flash in through-the-lens (TTL) mode.

7.10. Use the flash off-camera to direct the flash by hand at an angle that reduces glare or hotspots, controls shadows, and accentuates texture as needed.

7.11. An ALS may be used to document evidence not typically seen using visible light.

8. General Considerations

8.1. Use a ladder or step stool and normal lens when photographing the overalls, head shots, inside the body cavity, or as needed to avoid distortions.

8.2. The camera lens should be perpendicular to the subject being photographed. This is critical when using a scale.

8.3. The focal point should be a deliberate choice by the photographer. This is especially important in close-up photography, where the depth of field is extremely limited.

8.4. The case number should be clearly visible in every photograph captured.

8.4.1. Place the case number unobtrusively and oriented, when possible, in anatomical position with the bottom of the number parallel to the bottom of the feet of the decedent.

8.4.2. When moving from an orientation photograph to a close-up, do not move the case number unless absolutely necessary. This consistency greatly helps to orient the viewer and avoid confusion.

8.4.3. Use a case number of an appropriate size, so as not to cover anything relevant or be so large as to distract or overwhelm the photograph. Smaller case numbers should be used when photographing smaller areas, such as bullet holes, eyelids, wounds, etc. Some cases may require three or four different size labels while others may require only one or two.

8.4.4. When photographing organs or specimens outside of the body, position the case number label anatomically as if the organ were still inside the body. This consistent placement is used so that in every photograph captured, whether overall, orientation or close-up, the viewer will know what direction is up, down, right, or left.

8.5. All backgrounds should be as clean, dry, and free of distraction as possible. Make sure that the body and tray it's on are clean and dry when taking the overall photographs and the photographs are framed as closely to the edge of the tray as possible. If distracting elements are visible in the background, frame the shot differently to avoid this or use a neutral colored cloth or board to act as a background.

8.6. When photographing features on or inside of the body, an orientation photograph should be captured of that feature in reference to a physical structure or "landmark" on the body. It should be captured with as wide a view as practical without showing any distracting elements in the background. A second, close-up photograph should be captured filling the frame with the feature in question. If a scale is to be used in relation to the feature, take one orientation photograph, one close-up photograph without the scale, and an additional close-up photograph with the scale.

9. General Photographic Documentation

9.1. As Is photographs: capture these photographs before moving the decedent, cleaning or shaving the body, or removal of any medical intervention or devices.

9.1.1. Bag & Seal – A photograph of the body bag that the decedent arrived in including all labels or tags, and a photograph of any and all seals used to keep the body bag closed.

9.1.2. Anterior Overalls – Three overlapping photographs of the upper, mid, and lower body with a large scale and large case number clearly visible in each photograph.

9.1.3. Head Shot – A photograph of the head and upper shoulders with a large case number below the chin in anatomical position. The photograph should be captured with a focal length of 50mm or longer (preferably between 85 and 105mm) to avoid distortion, and as centered and perpendicular as possible, in accordance with the Frankfurt Plane. See Figure 1:

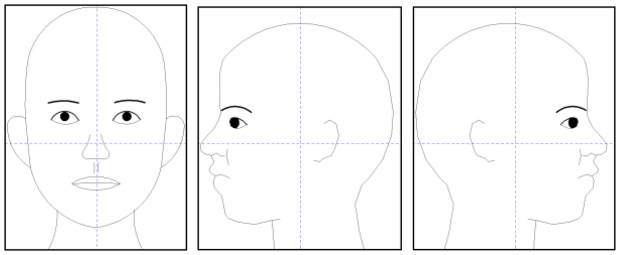

Figure 1

9.1.4. Posterior overall photographs if necessary.

9.1.5. Additional photographs as needed.

9.1.6. Personal Effects – Photographs should be captured of all personal effects, (i.e., jewelry, watches, wallet, etc.) while still on the body. All personal effects should then be photographed off of the body on a clean background.

9.2. After photographs described within 9.1 are captured and the Forensic Pathologist is done with documentation, the body may be removed from the bag. Capture additional photographs as needed to document features not visible before the body was removed from the bag or are more easily photographed with the body removed from the bag. The body should be cleaned so that the following photographs are free of any extraneous blood, fluids, or any other distracting elements that could obscure the subject.

9.3. Overall Photographs:

9.3.1. Anterior Overalls – Capture three overlapping photographs of the upper, mid, and lower body with scale and case number clearly visible.

9.3.2. Posterior Overalls – Capture three overlapping photographs of the upper, mid, and lower body with scale and case number clearly visible.

9.3.3. Scars, Marks, Tattoos, and other identifying characteristics – Capture orientation and close-up photographs with the case number placed unobtrusively and in anatomical position. Include a scale as needed.

9.4. Head Shots:

9.4.1. Photograph the head and upper shoulders with the case number below the chin in anatomical position. The photograph should be captured with a focal length of 50mm or longer (preferably between 85 and 105mm) to avoid distortion and as centered and perpendicular as possible, in accordance with the Frankfurt Plane. (See Figure 1)

9.4.2. ID Photographs: Capture an additional Head Shot for the purposes of identification, respecting the same rules as above. Take the time to make the decedent presentable (e.g., hair, closed eyes and mouth, clean and dry face, etc.). This photograph should be captured with a neutral background. In the case that there are injuries present on the face, these photographs can be captured of the profile view, with care being taken to photograph the side of the face with the fewest injuries. Compose this photograph showing as much of the face as possible while concealing trauma that may be disturbing.

9.4.3. For photographs used to facilitate automated facial recognition (FR) searches or manual facial comparisons that could contribute to forensic investigations refer to ASTM E3148-18 (Standard Guide for Postmortem Facial Image Capture)

9.5. Injury Documentation

9.5.1. An L-shaped forensic scale is preferred for injury documentation (e.g. ABFO no.2, NNDV no.2).

9.5.2. Capture orientation and close-up photographs of each injury with the case number placed unobtrusively and in anatomical position. Take close-up photographs without, then with a scale present. Repeat if the area is then shaved.

9.5.3. Place the scale on the same plane as the injury in question and photograph the scale and injury as perpendicularly as possible to obtain the most accurate measurement.

9.5.3.1. If the injury is on a contoured surface, reposition the scale and re photograph as necessary along the contour.

9.5.4. For close-up photographs, the scale should be placed on the edge of the photograph and not fill anymore of the frame than is necessary.

9.5.5. The scale should be oriented along the long edge of the photograph whenever possible.

9.5.6. Any pattern injury or possible "tool mark" on the body is to be treated the same way, giving consideration for examination quality photographs.

9.6. Internal Photography

9.6.1. When photographing the inside of the body cavity, the area being photographed should first be cleaned, patted dry, and excess blood or bodily fluids removed.

9.6.2. Consider proper flash placement and angle to achieve even lighting and avoid unwanted shadows.

9.7. Gross Specimen Photography

9.7.1. Organ or gross specimen photographs are often needed to record unique pathological findings. Photograph the specimen on a neutral colored background (board). Fill the frame as much as possible with the specimen and case number. Make sure that the specimen and the background are clean and dry (i.e. no excess blood or bodily fluids).

9.7.2. If there is a specific item of interest on the organ or specimen, a photograph of the entire organ or specimen should be captured, followed by a close-up photograph of the item of interest.

9.7.3. Consider proper flash placement to achieve even lighting and avoid unwanted shadows.

9.8. Examination Quality Photographs

9.8.1. Capture using the highest resolution and least compression available on the camera, Lossless RAW is preferred. For the benefit of a reviewer, photographs may be captured with a camera setting of RAW+.jpg.

9.8.2. The camera and lens used should meet minimum resolution requirements for the reproduction of the subject.

9.8.3. Photographs in this category include, but are not limited to bullet wounds, incised wounds, bite marks, ligature marks, tool marks, and pattern injuries.

9.8.4. Use a tripod, copy stand, or similar camera stability device.

9.8.5. Fill the frame with the subject.

9.8.6. Capture the photographs with the camera lens perpendicular to the subject.

9.8.7. Place the scale on the same plane as the subject in question and photograph the scale and subject as perpendicularly as possible to obtain the most accurate measurement.

9.8.7.1. If the subject is on a contoured surface, reposition the scale and re photograph as necessary along the contour.

9.9. Derived Evidence

9.9.1. Evidence should be placed on clean paper and photographed with a clean scale.

9.9.2. Clothing may need to be photographed when there is damage or physical evidence present. Care should be taken not to contaminate clothing.

9.9.2.1. Photograph labels, logos, unique belongings, etc. which may help identify an unknown decedent.

9.9.2.2. Defects on clothing can be highlighted with arrows or numbers of a contrasting color. Holes or tears can be accentuated by placing contrasting lighter or darker colored paper beneath them.

9.9.2.3. An overall photograph of both the front and back of the clothing and close-up photographs of each pertinent defect should be captured. Use a clean scale for the close-up photographs of the defects.

9.9.3. Photograph any prosthetics, medical equipment, pacemakers, etc. showing any applicable lot or serial numbers.

9.9.4. Photograph any evidence removed from the body (e.g., ligatures, bindings, bullets or fragments, etc.) with the case number placed unobtrusively. Take close-up photographs without, then with a scale present.

10. Retention and Storage of Photographs

10.1. All photographs should be retained as part of case documentation, regardless if they are captured with the photographer's primary camera or any other camera, such a back-up camera, cell phone camera, or point-and-shoot device.

10.2. Original photographs should not be deleted. All photographs, including poor quality images or unintended photographs, should remain as part of case documentation.

10.3. It is the responsibility of the organization to maintain all photographs so they are available for all intended purposes.

10.4. The organization should be aware of all local, state, and federal laws that regulate the manner, duration, and maintenance for evidentiary photographs; and should have policies in place that comply with those measures.

10.5. Digital photographs should be adequately maintained to prevent loss and degradation.

11. Keywords

11.1. Post Mortem Examination Photography

11.2. Post Mortem Documentation

11.3. Autopsy Photography

11.4. Autopsy Documentation

11.5. As Is Photographs

11.6. Head Shots

11.7. Overalls

11.8. ID Photographs

11.9. Injury Documentation

11.10. Internal Photography

11.11. Gross Specimen Photography

11.12. Examination Quality Photographs

11.13. Derived Evidence

11.14. Deletion of Photographs

11.15. Storage of Photographs