OSAC 2023-S-0006 Standard Guide for Photographing Scars, Marks, and Tattoos

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

OSAC Proposed Standard

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Standard Guide for Photographing Scars, Marks, and Tattoos

Prepared by
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Standard Guide for Photographing Scars, Marks, and Tattoos

1. Scope

1.1 This guide outlines best practices for photographing scars, marks, and tattoos on living or deceased persons to achieve high quality images and optimize image database searches and manual comparisons.

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. Referenced Documents

2.1 *ASTM Standards:*

2.1.1 E1732 Terminology Relating to Forensic Science

2.1.2 E2916 Terminology for Digital and Multimedia Evidence Examination

2.2 *FISWG Documents:*

2.2.1 *FISWG - Glossary - Version 2.0 - 2019.10.25*

2.3 *OSAC Documents:*

2.3.1 *OSAC 2021-S-0027, Standard Guide for Laboratory Photography*

2.3.2 *OSAC 2021-2-0013, Standard Guide for Post Mortem Examination Photography*

2.4 *SWGDE Documents:*

2.4.1 *SWGDE Lighting Techniques in Forensic Photography*

2.5 *NIST Documents:*

2.5.1 *NIST IR 8109 Tattoo Recognition Technology – Best Practices (Tatt-BP) Guidelines for Tattoo Image Collection Revision 1.0*

3. Terminology

3.1 *Definitions* - for definitions of terms used in this test method, refer to Terminology for Digital and Multimedia Evidence Examination E2916.

4. Summary of Practice

4.1 Universal Precautions

4.2 Suggested Equipment

4.3 Camera Settings

4.4 General Considerations

4.5 Scars

4.6 Marks

4.7 Tattoos

4.8 Special Techniques

5. Significance and Use

5.1 This guide is intended to increase the quality and consistency of photographs captured of scars, marks, and tattoos in order to optimize all end use cases, including manual comparisons and image database searches.

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

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

6. Universal Precautions for Health and Safety

6.1 Universal precautions is an approach to infection control in which all human blood and certain human body fluids are treated as if they are known to be infectious.

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

6.3 UV eye protection and protective clothing that covers skin should be worn when using UV light sources.

7. Suggested Equipment

7.1 Single Lens Reflex (SLR) Camera or Mirrorless Interchangeable Lens Camera (MILC)
7.2 Lenses
- 7.2.1 Wide Angle
- 7.2.2 Normal
- 7.2.3 Macro
- 7.2.4 Or a zoom lens capable of wide angle to normal and macro
- 7.2.5 Quartz (for reflective UV photography)

7.3 Lens Filters
- 7.3.1 Circular Polarizer
- 7.3.2 Ultraviolet
- 7.3.3 Infrared

7.4 Lens cloth
7.5 Storage media cards
7.6 Batteries
7.7 Light Sources
- 7.7.1 External flash unit
- 7.7.2 Ring flash

7.7.3 Infrared (IR) emitting (~750nm)

7.7.4 Ultraviolet (UV) emitting (between 300nm and 365nm)

7.8 Flash diffuser

7.9 Off-camera flash sync cord, or wireless trigger

7.10 Polarizing filters/gels for light sources

7.11 Various Forensic scales that have been previously checked against a known standard for accuracy (e.g. L-shaped, and straight edged, ABFO no.2); a scale that utilizes millimeters is recommended.

7.12 Tripod or stabilizing device

7.13 Cloths / towels / drapes

7.14 Step stool/ ladder

7.15 Neutral background material

7.16 Color reference target for setting white balance

8. Camera Settings

8.1 Set the correct date and time.

8.2 Format memory card.

8.3 Select an image format that allows for the highest resolution and least compression available, (i.e. Uncompressed RAW, TIFF, or highest quality JPEG available).

8.4 Use Manual exposure mode.

8.5 Camera settings such as focal length, aperture, and subject-to-camera distance should be considered to minimize distortion and control depth of field.

8.6 Use of an external flash in through-the-lens (TTL) mode is recommended. Alternatively, a ring flash should also be considered for even lighting, especially when photographing with a macro lens.

8.6.1 When using a flash, ensure the shutter speed is synced with the flash.

8.7 If not using a tripod or stabilizing device, use a shutter speed that minimizes image blur caused by camera movement (1/focal length or faster).

8.8 Set the White Balance to match the predominant light source, or use custom White Balance.

8.9 Use an ISO setting that minimizes artifacts from noise.

9. General Considerations

9.1 Follow agency guidelines on the inclusion of case identifying information and camera settings and equipment used in the photographs or bench notes.

9.2 The camera lens should be perpendicular to the area of interest being photographed. This is critical when using a scale.

9.3 The focus mode of the camera should be single point focusing, so that the focal point is a deliberate choice and placed on the area of interest. This is especially important in close-up photography, where the depth of field is limited.

9.4 If using an external flash, consider using it off-camera to direct the flash by hand at an angle to reduce glare or hotspots, control shadows, and accentuate texture as needed.

9.4.1 Avoid lighting with harsh shadows. A diffuser in front of the light may aid in reducing shadows.

9.5 A living subject's dignity shall be a primary consideration. If the subject will be disrobed or photographs are to be captured of areas of interest that would require exposing sensitive areas, they shall be draped in a professional manner or the identity of the subject at this stage should be shrouded.

9.6 An orientation photograph should be captured of the area of interest in reference to a physical structure or "landmark" on the body to establish its location. It should be captured with as wide a view as practical without showing any distracting elements in the background. If distracting elements cannot be avoided, consider placing a white sheet or other neutral background behind the subject. An additional close-up photograph should be captured filling the frame with the area of interest.

9.7 If the area of interest is large in size and its location is apparent in a close-up photograph, an orientation photograph may be unnecessary.

9.8 If the size of an area of interest is relevant and a scale is to be used, capture an orientation photograph, a close-up photograph without the scale, and an additional close-up photograph with the scale.

9.8.1 Place the scale on the same plane as the area of interest and photograph the scale and feature as perpendicularly as possible to obtain the most accurate image for any future measurements.

9.8.2 If the area of interest is on a contoured surface, reposition the scale and re-photograph as necessary along the contour. Maximizing depth of field should be a primary consideration as well.

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

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

10. Scars

10.1 Refers to dysmorphic or discolored areas or both of skin where permanent damage has healed (*FISWG - Glossary - Version 2.0 - 2019.10.25)*

10.2 When capturing close-up photographs of scars and enhancing texture is beneficial, using an off-camera flash at an oblique angle to the scar is recommended.

10.3 The use of Reflective Ultraviolet imaging may enhance detail not apparent in the visible spectrum. (See section 13.2)

11. Marks

11.1 Refers to portions of the skin that contain a different level of pigment than the rest of the surrounding skin. (*FISWG - Glossary - Version 2.0 - 2019.10.25)* These could be birthmarks, moles, freckles, piercings, etc.

11.1.1 Marks could also refer to external injuries of the body (e.g. bruises, lacerations, abrasions, etc.)

11.2 Any suspected pattern injury or possible "tool mark" on the body should be photographed with an ABFO no.2, or other L-shaped scale.

11.3 Due to the highly varied nature of marks, various photographic and lighting techniques should be considered.

11.3.1 The first approach should be to avoid lighting with harsh shadows, introducing a diffuser if necessary.

11.3.2 If the texture of the mark is an important component, consider using an off-camera flash at an oblique angle to accentuate it.

11.3.3 If the mark is hard to discern or somehow obscured, consider the use of any or all of the specialized techniques in section 13 to enhance detail not apparent in the visible spectrum.

12. Tattoos

12.1 Refers to a form of body modification made by ink, dyes, or pigments placed either temporarily onto the skin, or permanently into the dermis layer of the skin to form a design.

12.2 When capturing photographs of tattoos, avoid lighting with harsh shadows. If necessary, consider the use of a diffuser.

12.3 If the tattoo is faded or hard to discern, consider using polarization to increase the saturation and contrast of the image, as well as decrease light reflection off the skin. (See Section 13.3)

12.4 If the tattoo is obscured by darker skin tones, mummification, decomposition, or other factors, consider using Near Infrared photography to enhance detail not apparent in the visible spectrum (See Section 13.1)

12.5 The same tattoo photographed using different wavelengths of lights (i.e. visible, NIR, UV) can appear drastically different, which may affect the results of an image database search.

13. Special Techniques

13.1 Near Infrared (NIR)

13.1.1 This technique requires a camera that is sensitive to IR energy in conjunction with an IR emitting light source to enhance detail in the area of interest not apparent in the visible spectrum. This technique works especially well to capture details below the skin such as bruises, bite marks and scarring.

13.1.1.1 Capture an initial photograph of the area using normal lighting.

13.1.1.2 Mount the camera on a tripod or other sturdy device and compose the photograph of the area to be documented.

13.1.1.3 Use a light source with significant output in the IR spectrum; examples include external flash unit, tungsten or halogen bulbs)

13.1.1.4 Check focus and adjust as needed. A camera with live view will aid in checking focus, as IR filters block visible light.

13.1.1.5 Use a filter designed to transmit IR radiation while blocking visible light.

13.1.1.6 Capture an initial test exposure.

13.1.1.7 Evaluate the results, adjust the settings, and rephotograph as necessary.

13.1.1.8 Cameras produce a false color image when taking IR photographs. Further processing or conversion to black and white often produces better results. Additionally, consider capturing the image using a Camera RAW file format, which provides greater dynamic range.

13.2 Reflective Ultraviolet (UV)

13.2.1 This technique requires a camera that is sensitive to long-wave UV energy in conjunction with a longwave UV light source. This technique works especially well to capture details on the surface of the skin such as scarring and bite marks.

13.2.1.1 Capture an initial photograph of the area using normal lighting.

13.2.1.2 Mount the camera on a tripod or other sturdy mount and compose the photograph of the area to be documented.

13.2.1.3 All non-UV light sources should be turned off or blocked out for best results.

13.2.1.4 Use a light source with significant output in the long wave UV spectrum. Efforts should be made to minimize long term exposure to skin and eyes as UV exposure can be detrimental.

13.2.1.5 Use a filter designed to transmit UV radiation while blocking visible light such as a Baader U-Venus Filter (350nm).

13.2.1.6 Use of a quartz lens is recommended as it transmits a greater amount of UV light than a traditional glass lens.

13.2.1.7 Check focus and adjust as needed. A camera with live view will aid in checking focus, as some UV filters can block visible light.

13.2.1.8 Capture an initial test exposure.

13.2.1.9 Evaluate the results, adjust the settings, and rephotograph as necessary.

13.2.1.10 Cameras produce a false color image when taking UV photographs. Further processing or conversion to black and white often produces better results. Additionally, consider capturing the image using a Camera RAW file format, which provides greater dynamic range.

13.2.1.11

13.3 Polarization

13.3.1 This technique may eliminate glare and increase the saturation and contrast in an image.

13.3.1.1 Use a circular polarizing filter on the camera lens.

13.3.1.2 While looking through the lens or using live view, rotate the filter on the lens to observe the change in polarization until the desired result is achieved.

13.3.1.3 Consider using polarizing filters or gels on the light source(s) in conjunction with the polarizing filter on the camera lens for cross-polarization.

14. Keywords

14.1 Forensic Photography

14.2 Database searches

14.3 Near Infrared (NIR)

14.4 Reflective Ultraviolet (UV)

14.5 Cross Polarization