



E68 Clinical Implications of Using Alternate Light to Assess Bruises

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Learning Overview: At the end of this research-based session, attendees will be able to identify the benefits and challenges of incorporating alternate light into the clinical assessment of cutaneous bruises in living subjects.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing how victims of violence often have cutaneous bruises that are challenging to see when subtle, when found on older persons, and when found on persons of darker skin tones. Using an Alternate Light Source (ALS) in clinical settings can provide findings in support of a history of new blunt force trauma and weeks-old trauma.

After attending this presentation, attendees will identify the efficacy of using alternate light as an adjunct in the clinical assessment of blunt force trauma. Violence victims are often subjected to blunt force trauma that, due to skin color/pigmentation and injury age, can result in cutaneous bruises that are latent or barely visible. Additionally, family violence victims across the life cycle often receive serial physical abuse resulting in contusions of different ages. Failing to identify bruises can result in legal and health care treatment disparities.

In a recently completed longitudinal, randomized controlled study, an ALS found intentionally created upper and lower arm bruises were better visualized at 415nm to 450nm with yellow and orange filters when still visible in white (ambient) light and when no longer visible to the naked eye. Test subjects were assessed up to 21 times over 30 days. The findings were statistically significant in subjects from six known skin tones (dark, brown, tan, intermediate, light, and very light).

The findings from this study strongly support the use of alternate light in clinical settings to assist in the assessment of reported blunt force trauma in the presence of visible bruises in white light and bruises no longer visible in white light. However, alternate light absorption is not pathognomonic for the presence of current or recent bleeding from bruises under the skin surface. This presentation will trace prior research of using colorimetry alternate light in the assessment of bruises, topical products, and other naturally occurring skin artifacts that could mimic bruises. Attendees will learn to differentiate ALS findings that fluoresce versus absorb light and why escaped blood under the skin will absorb light.

The use of an ALS in a clinical setting can be used to support the consistency of the location of blunt force trauma obtained per patient history and to further support finding on a physical examination, such as pain or tenderness at the site(s) of absorption. Photographs of bruises under different alternate light wavelengths will be presented as well as clinical tips on taking photographs of ALS findings in a darkened exam room.

This presentation will discuss future bench and clinical research needs based on the study's findings. For example, in this study, researchers used yellow and orange goggles with plastic lenses sold and distributed by the ALS manufacturer. However, using a colorimeter, there was inconsistency in the measured values of all the yellow and orange goggles. In addition, other companies sell yellow and orange goggles that also vary in color from one set of goggles to another. Future research is needed on assault victims, especially those of darker skin tones, who report manual strangulation.

ALS, Bruises, Absorption