F19 Development of a Colorimetric Scale as a Visual Aid for the Time of Bruising in Blunt Trauma and Bitemark

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After attending this presentation, attendees will learn more about color of bruise versus age of bruise and how a colorimetric scale may be visual aid for the assessment of the age of bruising.

This presentation will impact the forensic science community by introducing two prototype colorimetric scales with and without linear

measurement, each with six bruising colors, three circles with black and white calibrators to be used for forensic photography of white European population

Medical examiners and forensic odontologists are frequently asked to establish the age of a bruise on a living or deceased individual. Injuries may be the result of bitemarks or of non-accidental traumas, thus having a medico-legal significance in the field of child abuse. In June of 1996, persons investigating child abuse and neglect were mailed a pamphlet from the U.S. Department of Justice entitled, "*Recognizing When a Child's Injury or Illness is Caused by Abuse,"* with a specific part dedicated to aging of bruises. The pamphlet gave a very clear cut description of color of bruise versus age of bruise, as follows: Red 0-2 days; Blue, Purple 2-5 days; Green 5-7 days; Yellow 7-10 days; Brown 10-14 days. However, a colorimetric scale for forensic photography based on the bruise colors has never been proposed, as photographic color reproduction is unreliable and depends on several factors, like camera, lighting, printer, and photo-editing color calibration.

The purpose of this study is to propose two prototype colorimetric scales with and without linear measurement, each with six bruising colors based on RGB color model, three circles with black and white calibrators to be used for forensic photography of skin injuries of white European population, during different stages of healing. The prototype scales were employed during forensic photographic imaging of cases of blunt trauma and bitemarks.

This study does not attempt to give a definitive account of the different scientific methods available for the assessment of the age of bruising. This presentation will present an opinion that a color aid when analyzing photos could assist with the interpretation and accuracy of estimation of bruise age, especially when the analysis it made directly on digital images prior to printing. Such an aid would give a reliable standard condition and allow color calibration. It is essential that the colors within the image represent colors within the bruise under standard and reliable conditions.

Observation on a large sample of blunt trauma and bitemark injuries applying the proposed colorimetric scales is needed to verify and validate the preliminary results obtained, although bruise age estimation remains an expert opinion with several degrees of accuracy and variability. For this reason colors within the bruise have to be analyzed by experienced and confident observers along with every and any relevant findings and observations in order to prevent errors or misjudgment.

A synergy between medical examiners and odontologists is also advisable for a more acceptable forensic interpretation in order to assess the correction parameters to be used in the proposed colorimetric scale. **Bruise Age Estimation, Forensic Odontology, Bitemark Analysis**

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