



## Pathology Biology Section – 2007

### G98 Forensic Diaphanoscopy Imaging: A New Tool in Clinical Forensic Medicine

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After attending this presentation, attendees will understand the principles of a new tool, the forensic diaphanoscopy imaging, and the benefits in comparison with more classical method (forensic diaphanoscopy), illustrated with practical examples of traumatic diagnosis in clinical forensic medicine.

This presentation will impact the forensic community and/or humanity by demonstrating how forensic diaphanoscopy imaging can facilitate the diagnosis of signs of violence on living adult, victims of aggression, or abused children.

The classical forensic diaphanoscopy method has been developed following the observation that there were no valuable methods to diagnose non visible hematomas on living subjects, such as adults who had been assaulted or abused children. This method has been used in Lausanne for over ten years in forensic clinical expertise. It is a complementary method to the clinical examination.

However, the probability of detecting a hematoma with this method (sensitivity) or the probability to diagnose correctly subcutaneous hematomas (specificity) depends on the training and the experience of the examiner. An insufficiently trained person should expect false positive or false negative results. The classical method of forensic diaphanoscopy is based on a subjective interpretation of the examiner. This is the reason why the forensic diaphanoscopy imaging technique, based on objective data, has been developed.

Compared to the classical method, forensic imaging diaphanoscopy has the following characteristics:

1. Use of an annular light source, aimed to integrate a centered video camera, and to increase the diagnostic reliability.
2. An integrated miniature video camera will help maintaining a database of analyzed traumas, and offer a source of pictures to be processed later by digital systems (computers).
3. The digital processing of the acquired picture will improve both sensitivity and specificity in detecting non-visible subcutaneous hematomas.
4. Automatic adaptation of the light source intensity, based on subcutaneous tissues thickness (not depending on body mass and corporal topography) and skin pigmentation.
5. Automatic exclusion of opaque zones due to intravascular blood.
6. Hematoma documentation using digital processing.

Forensic diaphanoscopy imaging represents a major advance compared to the classical method to diagnose traumas on living subjects. The technique is more user friendly and reliable, due to the use of technological assistance and computer information processing. Creating legal documentation is easier and images from the system can easily be integrated in reports. This reliable investigation method can easily complete a clinical examination by making or confirming the diagnosis of subcutaneous hematomas that are not readily visible. This method is also useful in excluding this diagnosis. It is a non-invasive and easy to use tool. It is particularly useful when child abuse is suspected, when examining dark skinned persons where hematomas can be confused with skin color, or even among obese persons where deep hematomas do not appear or only appear after a significant period of time on the skin surface.

The aim of forensic diaphanoscopy imaging is to facilitate the diagnosis of signs of violence on living adult, victims of aggression or abused children.

**Clinical Forensic Medicine, Diagnostic Imaging of Trauma, Invisible Hematoma**