



Photography of Fingerprint Evidence on the Bodies of the Living and the Dead

By: Philip Sanfilippo, Chairperson FDIAl Photography Committee

The processing of human skin for fingerprint evidence is a technique that has been attempted by law enforcement personnel for many years. Recent advances in the field have been yielding techniques that are making this type of evidence more practical to obtain than was possible in the past. The types of fingerprints we seek on the human body include latent prints (those not readily visible to the eye), patent prints (readily visible to the eye), plastic prints (three-dimensional impressions), and bloodprints (fingerprints derived from blood.) Once located or processed, it is essential to make a permanent record of the print. This can be done by photographing the print and by lifting the print. Regardless of whether or not the print is to be lifted, the print should always be photographed. In cases where the print is to be lifted, it is essential to photograph the print *first* since most prints are destroyed in the lifting process. We will discuss important points to consider in your photography of prints that have been developed or found on human skin.

When accomplishing photography at the crime scene, remember to utilize good crime scene photography techniques. Document the entire scene by photographing "overall" views. After this is done, photograph smaller portions of the scene using "establishing" photographs. These photographs will show orientation of items in the overall scene and positioning of smaller items of evidence to be documented later. Then photograph these smaller items with "close-up" photography. If and when you use identification markers and/or scales in your photography, always photograph the subject as found first. Identification markers or scales may then be introduced to the scene and the photography repeated.

This is done in this order to demonstrate that nothing in the scene is being concealed and to avoid the transfer of physical evidence into the photographed scene.

Photography of fingerprints on the body should be approached in a method that is similar to photography of the crime scene. That is, "overall", "establishing", and "close-up" photographs are to be taken. Photographs of the victim are taken in a way that shows the entire body, the portion of the body where the fingerprint has been found or processed, and then the print itself. There are guidelines that should be followed whenever possible when photographing reclining bodies such as the deceased victim. Avoid photography of the body that is taken from the viewpoint of "nose to toes" or "toes to nose." In other words, avoid views of the body that are photographed along the vertical axis of the body. This tends to give a distorted view of the body that renders the

body part that is closest to the lens as larger than normal and the body part that is further from the lens as smaller than normal. One method of photography of reclining bodies that gives excellent results is overhead photography. In overhead photography, a camera is suspended above the scene on a pole and is activated remotely. This results in a perpendicular photograph of the victim's body from above. Please bear in mind that this photography is something more than normal crime scene photography. In these cases, we are not photographing a location or inanimate objects. Here we are photographing human victims. Whether they are living or deceased, victims should always be treated with utmost dignity.

When documenting fingerprints on the victim's body, photographically record the ambient air temperature and the victim's skin temperature. There are additional items that are to be documented. Photograph visible bitemarks, bruises, and trace evidence whether the victim is living or deceased. Consider reflective ultraviolet photography to document bitemarks and bruises that are not visible to the naked eye. If the victim is deceased and has been embalmed, note that a fluid called "Visabalm" that is used by undertakers in the embalming of bodies may hinder this effort. "Visabalm" is a clear odorless fluid that fluoresces when excited by an ultraviolet light source. This fluorescence tends to interfere with ultraviolet photography of the body in which the fluid has been utilized. Also, in cases where the victim is deceased, document the condition of the body noting any mold and/or decomposition that are present.



When photographing fingerprints or bitemarks on the skin, use of a scale such as the ABFO #2 is required. The ABFO #2 scale was designed by the American Board

of Forensic Odontologists (ABFO) for use in the recording of bitemarks and forensic dental evidence. When used properly, the technician who is printing photographs that were taken with the scale in position, can produce images of the evidence that are life-size and undistorted. When being used with 35mm format cameras, this scale is designed to be used at approximately 1:4 to 1:5 magnification ratios which equates to $\frac{1}{4}$ X life-size and $\frac{1}{5}$ X life-size respectively. (Remember that photography at magnifications of 1:4 and greater require increased exposure. For example photography at a ratio of 1:4 requires exposure increase of .5 stop or +.5 exposure value (e. v.), photography at a ratio of 1:2 requires exposure increase of 1 stop or +1 e.v., photography at a ratio of 1:1 requires exposure increase of 2 stops or +2 e.v., and so on.) The proper way to position the ABFO #2 scale is to place the scale in the scene so the scale is facing the direction from which the pho-



graph is to be the scene is to be photographed to include the entire scale from a position that is as close as possible to perpendicular.

Lighting fingerprints on human skin can be a difficult proposition. Skin has properties that can cause the reflection of light. In cases where the victim's skin has upon it moisture such as condensation, this reflection can be more pronounced. When electronic flash is to be used, the flash should not be mounted on the camera. The flash should be attached to the camera by way of an extension cord that allows off-camera activation. When photographing in this manner, the angle and direction of the flash is to be varied. Additionally, the photographer must remember to not exceed the capability of the flash unit. Electronic flash units don't just have maximum working distances or ranges, they also have minimum ranges that must not be exceeded. For example, when a flash has a guide number (G.N.) of 80, the flash should be used at 10 feet

Aperture	f2.8	f4	f5.6	f8	f11	f16	f22
Distance	28.5'	20'	14.25'	10'	7.25'	5'	3.5'

with an aperture of f8, 7.25 feet at f11, 5 feet at f16, and 3.5 feet at f22, when the flash is in manual mode. The following table shows flash distances for an electronic flash with a guide number of 80, when the flash is in manual mode.

ELECTRONIC FLASH Flash Distances for Manual Flash, G.N. 80 Full-Power

Power dividers are devices that are either built into electronic flashes or available as accessories for the flash. As their name suggests, the power divider decreases the light output of the electronic flash unit so the flash can be used at distances less than the maximum range. Different makes and models of power dividers vary in their capability. Most power dividers make their divisions in 1-stop increments. That is, each division is one-half the value of the previous division. For example, 1 (full-power), $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, etc. When using a power divider with the flash mentioned above, half-power would equate to an effective guide number of 40.

Power	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{64}$
Effective G.N.	80	40	20	10	5	2.5	1.25

Quarter-power would equate to an effective guide number of 20; eighth-power would equate to a guide number of 10, and so on. See the following table for effective guide numbers.

ELECTRONIC FLASH Effective Guide Numbers for Manual Flash, G.N. 80 Where Power Divider is Used

In order to establish correct exposure using guide numbers; divide the guide number by the aperture to be used to

establish distance between the subject and the flash unit. (Note that this measurement is for distance between the flash and the subject and not the distance between the camera and the subject.) Conversely, when working with a given distance between the flash and the subject, you divide the guide number by the distance to determine the correct aperture.

When using an electronic flash in automatic or TTL¹ modes, refer to the manufacturer's specifications for minimum working ranges with the specific model of flash being used. If the information for your flash is not readily available, there is a rule-of-thumb that can be used. In many cases, the minimum range of an automated flash is 20% of the stated maximum range. Bear in mind that this does not hold true for all flashes. To determine the minimum range for your flash, start with a distance that is 20% of the maximum range and bracket exposures by moving the flash back and forth without moving the camera or the subject. Record the distances and exposure data on a photo log. This test should be conducted using transparency film. After conducting the test, review the processed film to determine the closest distance that gives the correct exposure, and use that distance in the future as your closest working distance. Any test of this nature should be done prior to attempting photography of critical evidence. Also, most modern electronic flash units have some sort of flash confirmation indicator built-in. Flash confirmation indicators alert the photographer to improperly exposed photographs where electronic flash is used. If you familiarize yourself with your equipment, you will be able to determine if the flash exposure was correct or incorrect by consulting this indicator.

If electronic flash is not available or not practical for some reason, photography of the print can be accomplished with ambient light or a constant intensity light source. These include spotlights, floodlights, fiber-optic light sources, incandescent lamps, and others. The benefits of using a constant intensity light source are that the photographer can more easily visualize the photograph before it is taken, and the camera's meter can be used to set the exposure without having to compute range for the electronic flash. The downside to using a constant intensity light source is that motion will be more evident in the resulting photograph. (Remember; electronic flash can "freeze" motion by virtue of its very short duration of light.) If either ambient light or a constant intensity light source is to be used as the main light source, make sure that preparations have been made to deal with both camera motion and subject motion. Camera motion can be minimized or eliminated by using a steady tripod and a cable release. In this type of case, when we say subject motion we are speaking of the motion of the victim's body. This motion can be dealt with effectively by using sandbags in strategic areas to either support the body or restrain its movement. Bear in mind that even when the victim is deceased, stabilization of the body might be required in order to take a motion-free photograph.

Another important factor in photographing fingerprints on the human body is depth-of-field. Often, fingerprint evidence is found on flat surfaces. When this happens, depth-of-field is not an important consideration. However, when fingerprints



are found on a three-dimensional surface, such as a body, depth-of-field *is* important. If a print is to be documented on a curved portion of the body, like the ankle or the arm, it is important for the photographer to select an aperture that will give sufficient depth-of-field to the photograph. This will ensure that the entire print will appear in acceptably sharp focus in the finished photograph. Failure to do so will result in a photograph where part of the print is in-focus and part is out-of-focus. If the minutiae needed for identification are located in the out-of-focus area of the print, the photograph is useless. The use of smaller apertures increases depth-of-field. This also leads to slower shutter speeds when ambient or constant intensity light is being used. In these cases refer to the above information on camera and subject stabilization.

When we process a human body for fingerprint evidence, we are normally doing so in the investigation of a very serious crime. The evidence we discover in this process can be cru-

cial to the successful outcome of these investigations. For this reason, it is extremely important that latent fingerprint evidence that is processed on the human body be documented and preserved properly to include photography of the print. These photographs should be composed, focused, and exposed correctly. By following the listed guidelines, you can be assured of evidentiary photographs that are of the highest quality. ■

Footnotes:

¹ TTL is a type of electronic flash mode. In this mode, the camera is in communication with the flash unit. The camera activates the electronic flash when the shutter is open, senses the intensity of the flash illumination entering "through the lens," and "turns the flash off" when enough illumination to properly expose the scene is sensed.

Study: DNA Tests for All Arrestees Probably Legal

By: Richard Willing USA TODAY

Performing DNA tests on everyone arrested and charged with a crime probably is permitted under the Constitution, a federal DNA study group has concluded.

That finding made by a committee of the National Commission on the Future of DNA Evidence, will be debated by the full 22-member panel at its summer meeting in Boston.

If approved by the panel, the finding will be forwarded to Attorney General Janet Reno, who will use it to set Justice Department policy and provide nonbinding guidelines to state law enforcement officials.

Broad-based use of DNA test on all people who are arrested is unlikely to begin soon. But the committee's findings provide ammunition for police and others who argue that widespread testing will help link people arrested for nonviolent crimes to many unsolved murders, rapes and other violent crimes. "In New York City, we find that a substantial portion of (violent felons) had also been arrested for much smaller offenses (before) they were caught for the big ones," Police Commissioner Howard Safir says.

Earlier this month, the DNA commission urged Reno to oppose immediate testing of all arrestees because it

would over tax the system.

Nationally, states already are laboring to analyze and add to a federal database the DNA of all 1.4 million people who have been convicted of serious crimes. Testing all arrestees, more than 15 million people a year according to FBI estimates would greatly increase that backlog.

But the commission left open the question of whether such test should be permitted once the backlog is cleared up.

Privacy advocates argue that the test would violate constitutional protections against unreasonable searches and would give authorities access to personal genetic information.

A draft report says establishing DNA databases likely would pass federal court scrutiny, provided they are "highly secure" and the procedures for taking DNA are "minimally invasive."

"As we move from (taking DNA from) blood samples to lifting it right off of fingerprints, the invasiveness issue is going to be resolved," says Jeffrey Thoma, a Ukiah, Calif., prosecutor who worked on the report. "Resolving privacy concerns, like how to keep the (DNA) data from being used to deny insurance or something, is something we have to move much further on."

DNA databases work by extracting DNA, a unique set of genetic markers, and comparing it via computer with DNA left at crime scenes in blood, semen and even perspiration.

From 1992 to 1998, state crime laboratories and the FBI made DNA matches in more than 425 crimes. ■

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