Practical strategies for improving clinical photography of dark skin

To the Editor: Recent literature has called for action to improve the quality and availability of clinical photography and kodachromes featuring dark skin.[1-3] This article provides a practical guide for clinicians and staff to improve clinical photography for dark-skinned patients in a typical dermatology practice. These recommendations should improve clinical photography for all skin tones; however, the challenges of capturing dermatologic pathology on dark skin makes the optimal photographic techniques outlined in this document of particular importance.

Table I. Outline of specific recommendations for measures to improve clinical photography of dark skin in the typical dermatology practice

Setup
1. Prepare the skin. Gently clean the skin that will be photographed to remove any makeup and foreign debris. Remove all jewelry and excess hair from the area.
Avoid removing secondary features, such as crust or scale, while cleaning.
2. Clean the lens. Use a soft cloth to wipe the camera lens prior to every use to ensure that the lens is clean.
3. Stabilize the camera. Use a tripod to stabilize the camera in order to clearly capture finite details. Details, especially subtle ones, may be somewhat obscured by melanin; therefore, high resolution is crucial.
If unable to use a tripod, stabilize the camera by resting the bottom edge on a table or flat, steady surface.
4. Position the camera at an appropriate distance from the skin, about 3-4 feet away. Use zoom as necessary to obtain closer images. While photographing diffuse pathology, take both overview and focal photographs.
Avoid zooming more than half of the capability of the camera because this may compromise the resolution of the image. This does not apply while using a macro lens. With these lenses, the camera can be held closer to the surface of the skin.
5. Use a plain, nonreflective backdrop. Use a plain wall or, when possible, a sheet as a backdrop. The background should provide moderate contrast to the tone of the skin; however, it should not be too light because this might lead to overexposed dark skin. The background should not be overly reflective because this may cast glare on the pathology.
Do not compromise the quality of lighting for the sake of the backdrop.
Light- to medium-toned royal-blue backdrops generally provide contrast to dark skin tones without casting abnormal hues onto the skin.
Felt or other wrinkle-resistant fabric or matte photography background paper will provide the ideal backdrop texture, which should be uniform and nonreflective. Foam core sheets can be purchased at a craft store and used as an accessible and cost-effective background.
Lighting
1. Invest in an appropriate light source. Avoid the use of the built-in flash on a camera because these flashes reflect light off of the surface of the skin directly back into the lens, causing glare. An LED light source produces less glare while providing high-quality, uniform light.
An LED ring light can be purchased at a low cost and can provide high-quality light and flexibility in positioning of the light for optimal clinical photography.
2. Angle the light source to avoid glare. For most images, position the light source and/or patient so that the brightest light is angled at 45° to the surface of the pathology.
Positioning becomes very important when there is an inflexible light source.
3. Position the light source close to the skin. If you have access to a flexible lighting source (like a ring light), the light should be held as close to the surface of the skin as possible without inhibiting the frame of the image.
4. Adjust camera and lighting angles to highlight texture. Oblique lighting will better capture intricate details of the surface of the skin, especially when photographing raised lesions. This can be accomplished by positioning the light source at less than 45° to the surface of the pathology.
5. Capture several images of the same pathology. Use more than 1 camera and lighting angle to demonstrate variations in the appearance of pathology.
6. Seek even lighting across the surface of the skin. When relying on overhead room lighting, a large surface area is preferred. This will cast softer light onto the surface of the skin and allow for more accurate depiction of the texture and tones of the skin.
7. If there are multiple sources of light, try to use light sources with a congruent undertone. To obtain the most accurate depiction of color, use a light source with neutral, white tones rather than overly warm-toned light, which casts yellow hues, or overly cool-toned light, which casts blue hues.
In general, natural light and camera flashes or ring lights cast subtle blue-white tones, whereas common overhead lights cast more substantial yellow-orange tones. When using a flash or ring light, it is best to use this as the main light source to the targeted area and decrease artificial ambient lighting.

Continued

Table I. Cont'd

Settings
1. Select "Auto" or "Program" mode. This will allow the camera to self-adjust settings according to the subject of the photo and the lighting.
If using an external light source or natural light, use the flash-off or natural light setting.
2. Set the metering mode to "spot." Metering modes will assess the image and accordingly set appropriate exposure for the amount of light coming into the image. Cameras are generally set to "evaluative" or "matrix," which will survey the entire image. "Spot" metering will set the exposure based on a selected point on the image.
"Evaluative" or "matrix" metering can overexpose dark skin, especially if the skin is darker than the frame's average.
"Spot" metering is generally more appropriate for clinical photography, especially while capturing focal pathology.
If an LED light source cannot be accessed, both "spot" and "matrix" modes should be turned on. Exposure should be bracketed from −2 to +2.
3. Set the appropriate white balance. If using a flash, set white balance to flash mode; otherwise, use auto mode. This will adjust the color of the image to minimize aberrant hues cast by the light source or surroundings.
Light or brightly colored walls and/or backdrops that may be encountered in an office may cast aberrant hues on dark skin. Even with the assistance of white balance, attention should still be paid to the tone of the background, which impacts the functionality of this setting.
4. Enable the automated "HDR" setting when available.
Camera choice
1. Consider purchasing dedicated equipment. With the current technology, nearly any camera available for purchase will be equipped with sufficient resolution for high-quality clinical photography.
If purchasing a new camera, those with interchangeable lens capabilities generally produce the highest-quality images.
2. The camera should use optical (rather than digital) zoom with focal length capabilities of 4:1.
3. Purchase special lenses for close-up photography. Macro lenses are available for purchase and can produce exceptional high-resolution images for close-range photography.
When using a macro lens, be sure to adjust settings to macro mode.
Smartphones and tablets
1. Tap the screen in the area of pathology to focus the image. This will also optimize lighting by transitioning the camera from "evaluative mode" to "spot mode."
2. Zoom in to avoid distortion caused by wide-angle zoom. Smartphone or tablet cameras automatically set to a wide-angle zoom. To avoid a "fish-eye" appearance, position the camera 3-4 feet from the surface of the skin and zoom slightly.
Zoom can be achieved by placing 2 fingers on the center of the screen and slowly pinching outwards. Avoid zooming beyond halfway to the maximum zoom, as this may compromise the clarity of the photograph.
3. Disable "live" or "motion" photo and "portrait mode or "live focus," when applicable.
4. Stabilize the camera with a tripod that is specifically designed for the smartphone or tablet.

HDR, High-definition resolution; *LED*, light-emitting diode.

SETUP

Preparation is instrumental in achieving high-quality photographs of dark skin (Table I).[4,5] This includes setting a background with moderate contrast as well as positioning and stabilizing the camera. Using a background that is too bright results in underexposed images, and a background that is too dark provides poor contrast. A nonreflective medium- to royal-blue background typically works best. Rigid blue foam core sheets from a craft store are a cost-effective solution.

Lighting

Lighting is the most critical aspect of obtaining a high-quality image. Dark skin is more likely to produce glare (Table I).[4,5] The most essential element for improving dark skin photography is consistent, high-quality, bright light that is held close to the skin at an angle that does not produce glare. A light-emitting diode light source is superior to a flash in minimizing glare and producing uniform lighting.[4,5]

Settings and camera choice

The quality of cameras available in clinical practice has improved significantly, and any recently purchased camera can produce excellent results if correct lighting is available. Many offices use the digital cameras included in smartphones or tablets. These do not feature an adjustable F-stop, and thus, close-up images may not have an adequate depth of focus. Alternatively, while using a digital single-lens reflex camera, which does allow for an adjustable F-stop, the camera should be placed in an aperture value priority setting with the F-stop set to 22. If a light-emitting diode light source is not available,

images should be taken with both "spot" and "matrix" light metering, and exposures should be bracketed from −2 to +2 (Table I).[4,5] Image sensors and lens coatings resistant to glare can also improve the quality of clinical photography of dark skin.[4,5]

In summary, improved confidence and practices as well as continued innovations in photography will benefit clinical photography of dark-skinned patients. We hope that along with ongoing efforts as a specialty, the practical strategies outlined in this article will help increase the availability of images that demonstrate the unique appearance of pathology on dark skin. Work to improve the quality of clinical photography of dark skin will help improve representation in educational resources and reference materials with the downstream goal of improving clinical acumen and pattern recognition of dermatologic disease in a significant portion of our patient population. Ultimately, this might improve dermatologic outcomes for dark-skinned patients and help reduce existing health disparities.

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Conflicts of interest

None disclosed.

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