Color awareness: A must for patient assessment

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Your 75-year-old patient is short of breath. Knowing his natural skin tone is dark, you're unsure how to assess for central cyanosis.

An adolescent patient has a serious soft-tissue injury of the leg, but you can't see bruising because her skin is darkly tanned.

After a sexual assault, a dark-skinned patient arrives at the emergency department with a suspected abrasion of the labia minor. But even when you apply contrast medium, the injury is hard to detect because of the surrounding skin color.

The skin is the body's largest organ. Skin color can reflect a patient's overall health and is an important part of assessing skin breakdown and wound healing. For instance:

- Pallor may indicate anemia
- Cyanosis may signal hypoxemia
- Degree and extent of skin redness is important in burn care
- Understanding skin-color changes is crucial for detecting and staging pressure ulcers.

But the exact nature of such color changes as pallor, cyanosis, and redness varies with the patient's natural skin color—and this can pose a challenge in providing clinically competent and culturally sensitive care. Long a source of discrimination, skin color is a socially sensitive issue. Identifying and evaluating skin color raises questions about stereotyping and the social benefits of being "color-blind."

Most skin-care guidelines apply mainly to patients with light skin. Yet the Hispanic and Asian populations of the United States are expected to triple over the next half-century. By 2050, people of Hispanic, African, Asian, and Caribbean ancestry likely will represent more than half the total U.S. population. Obviously, healthcare professionals will be caring for an increasingly diverse population of many ethnic backgrounds and skin colors. This article explores the concept of skin-color awareness, discusses the role of skin color in nursing assessment, and explains why healthcare providers should practice color awareness, not blindness.

Constitutive vs. facultative skin color

Constitutive skin color is the natural, genetically determined color of the epidermis, uninfluenced by ultraviolet (UV) light or hormone exposure. Typically, it's seen in areas of little or no sun exposure, such as the underside of the upper arm.

In contrast, facultative skin color results from exposure to UV light and other environmental factors. Tanning, for instance, changes the composition of melanin in the skin and increases the amount and size of melanin produced by melanocytes. Thus, facultative skin is darker than constitutive skin. (See the box below.)

How skin gets its color

Melanocytes are cells in the epidermis (the skin's outer layer) that are genetically programmed to produce a specific amount of melanin—the pigment that gives skin its specific color. Skin color is the result of reflected and absorbed light from unpigmented skin, mixed with colors of various constitutive pigments, such as melanins, hemoglobins, and carotenes. As light hits the skin's surface, it is either reflected diffusely back, scattered, or absorbed by particles within the skin. The most superficial layer of the epidermis transmits most light through to the more basal layers of the epidermis, dermis, and hypodermis. These layers scatter some light while melanin in the epidermis absorbs light, producing an orange, brown, or black color.

In the dermis, some light is scattered and some is absorbed by collagen, yielding a yellowish color. In both the epidermis and dermis, carotene absorbs light, also creating a yellow hue. Hemoglobin in the superficial capillaries absorbs some light; oxygenated hemoglobin produces a reddish tint while reduced hemoglobin yields a bluish color. Finally, the subcutaneous fat layer in the hypodermis scatters back a large portion of light that has made it through all the layers.

Why color "blindness" can reduce health outcomes

Skin color may be a source of disparate health outcomes for many reasons, not just discrimination or poor access to care. Disparity can occur if well-intentioned healthcare professionals are color "blind"—disregarding a patient's skin color because they believe doing this will help them provide the same level of care to all patients regardless of skin color. But this approach limits the relevance of skin color to health and limits nurses' ability to provide individualized care.

For instance, as a nurse you've been trained to assess skin breakdown by testing the skin's blanch response to light finger pressure. When evaluating for a stage I pressure ulcer, you apply light pressure to the skin; this temporarily squeezes blood out of the underlying area, reducing local blood volume and causing an area of blanching, or whitening. If the skin appears red, blue, or purplish and doesn't blanch, you might classify the area as a stage I pressure ulcer. But in dark-skinned patients, the blanching test has limited value. The greater amounts of melanin in dark skin may mask the blanch response, making the color change invisible despite the local change in blood volume.

Forensic implications

What's more, researchers studying forensic sexual assault examinations found data suggesting black women had a lower prevalence of genital injury after rape than white women. They suggested that the difference in reported injury prevalence wasn't related to race or ethnicity but to either reduced visibility of injury in dark-skinned women (compared to light-skinned women) or actual differences in skin properties, depending on skin color. They also found dark-skinned women had fewer injuries than light-skinned women after consensual sexual intercourse. Their research showed that skin color more fully explained the differences in the numbers of genital injuries than race or ethnicity in both groups of women—those who'd been raped and those who'd had consensual intercourse. In other

words, the prevalence of genital injuries in dark-skinned women has likely been underreported because of difficulty seeing the injuries.

These findings are particularly important given the role of forensic evidence in the criminal justice system. Women whose injuries are documented during the forensic examination have better judicial outcomes at every step of criminal justice proceedings than women without documented injuries. Those with documented injuries are more likely to report rape to the police, more likely to file charges, more likely to have their cases prosecuted, and more likely to have the accused persons convicted.

Cultivating color awareness

Unlike color “blindness,” color awareness acknowledges that skin color is relevant to health and shouldn’t be ignored. What’s more, it acknowledges that people across the skin-color continuum may not want to be treated as raceless, colorless, or without ethnicity, since much of a person’s identity stems from being a specific color. By applying color awareness to health assessment, healthcare professionals can more appropriately manage skin conditions among patients of all skin colors and help reduce disparities in healthcare delivery.

Skin color assessment methods

The most common way to assess skin color is to use the Fitzpatrick scale, which was developed to classify skin type during a study of UV dosing in psoriasis treatment. (See the box below.) The latest version of this scale classifies skin into one of six types based on its reaction to sun exposure. However, this scale isn’t particularly helpful in nursing assessment because of its focus on the effects of sun exposure and because dark-skinned people fall into primarily one category.

Fitzpatrick skin pigmentation classification scale

Skin type is determined by several factors, including genetics, as indicated by skin color and reaction to sun exposure. The scale below classifies skin by complexion and tolerance of sunlight. Many practitioners use it to determine how likely a patient is to get skin cancer.

SKIN TYPE	APPEARANCE	REACTION TO SUN EXPOSURE
Type I	• Very fair; very light ivory skin tone • Freckles common • Usually blond hair and light-colored eyes	Always burns; never tans
Type II	• Fair • Light white to pale tan skin tone • Light eyes and hair	Burns easily; tans minimally
Type III	• Fair to medium tan skin tone • Eye and hair color vary	Burns moderately; tans moderately
Type IV	• Medium, beige-olive skin tone • Moderate pigmentation • Usually dark hair and eyes	Burns minimally; tans easily
Type V	• Medium brown skin tone • Heavy pigmentation. Usually dark hair and eyes.	Rarely burns; tans profusely
Type VI	• Dark brown to black skin tone • Heavy pigmentation • Dark hair and eyes	Never burns*; tans profusely

Based on: Fitzpatrick T. The validity and practicality of sun-reactive skin types I through VI. Arch Dermatol. 1988;124:869-871.

*Most experts now agree that sunburn does occur in people with very dark skin.

Other assessment scales use different classification criteria. One scale classifies skin color as dark, darkish, or fair. A second scale uses four categories—fair, fair/medium, medium, and dark. A third uses a skin-tone chart consisting of eight categories of color ranging from 1 (lightest) to 8 (darkest).

Skin color also can be assessed through digital image analysis or measured with such instruments as a spectrophotometer or colorimeter. These techniques generally are used in research, to collect forensic evidence, or during dermatologic procedures. For clinical skin-color assessment, visual inspection and asking patients about their normal skin color are the best methods.

Recommendations for assessing dark-skinned patients

When assessing a patient's skin, use natural light or a halogen lamp rather than fluorescent light, which may alter the skin's true color and give the illusion of a bluish tint.

Skin color is particularly important in detecting cyanosis and staging pressure ulcers. Cyanosis occurs when a person has 5 g/dL of unoxygenated hemoglobin in the arterial blood. Central cyanosis (cyanosis of the lips, mucous membranes, and tongue) occurs when arterial oxygen saturation falls below 85% in patients with normal hemoglobin levels. In light-skinned patients, cyanosis presents as a dark bluish tint to the skin and mucous membranes (which reflects the bluish tint of unoxygenated hemoglobin). But in dark-skinned patients, cyanosis may present as gray or whitish (not bluish) skin around the mouth, and the conjunctivae may appear gray or bluish. In patients with yellowish skin, cyanosis may cause a grayish-greenish skin tone.

Checking for pressure ulcers

When checking for pressure ulcers in dark-skinned patients, remember that dark skin rarely shows the blanch response. Instead, after applying light pressure, look for an area that's darker than the surrounding skin or that's taut, shiny, or indurated (hardened). If you suspect a skin area is becoming damaged, use the light from a camera flash system to enhance your visualization of dark skin; with the patient's permission, take a series of digital images each day to document changes in wound color, size, and depth. Check for localized changes in skin texture and temperature. Early signs of skin damage include induration, bogginess (less-than-normal stiffness), and increased warmth at the injury site compared to nearby areas. Over time, as tissues become more damaged, the area becomes cooler to the touch.

Erythema also may be hard to detect in dark-skinned patients. In a light-skinned patient, irritation may cause redness. But in a dark-skinned person, it may cause hyperpigmentation (increased pigmentation) or hypopigmentation (reduced pigmentation), with no redness visible. Sometimes, dark skin takes on a dark bluish-purple tint at the site of early pressure-ulcer development. So when caring for a dark-skinned patient at risk for pressure ulcers, keep in mind that assessing by touch is as important as visual inspection.

Tips on assessing dark-skinned patients

- When inspecting the skin, use natural light or halogen light, not fluorescent light. Non-glare daylight is the best light for skin assessment. Fluorescent light imparts a bluish tone to dark skin and makes it harder to see skin changes.
- Don't wear gloves to perform skin assessment because they diminish sensitivity to skin temperature changes, which are critical in assessing dark skin.
- Assess non-injured skin areas first. Ask the patient, family, or caregiver to point out an area of normal skin color, temperature, and texture.
- Remember that dark skin doesn't blanch when you apply pressure over a bony prominence.
- Cyanosis in dark-skinned patients appears as a bluish tint of the conjunctiva or palms, a grayish-white color around the lips or tongue, or a maroon tinge to the nail beds.

- Check skin areas with the least amount of pigment—palms, soles, tongue, palate, oral mucosa, conjunctiva, sclera, and nail beds.

Detecting skin injury

- In patients with dark skin, localized areas of inflammation may take on an eggplant (purplish-blue or violet) color rather than appearing erythematous (red). To help detect a raised rash, touch areas that are itchy or uncomfortable.
- Keep in mind that injured skin may be darker than surrounding skin. Ask the patient, caregiver, family, or significant others if the skin color looks different than normal.
- Regardless of skin color, you should be able to detect localized heat over an area of localized inflammation. As an injury or pressure ulcer progresses, tissue devitalization occurs and the skin may start to feel cool when touched with the back of the hand or fingers.
- Unlike light skin, whose color commonly darkens as it heals, the skin of darker patients may lighten as it heals before returning to its normal color.
- Injured skin may have non-pitting edema (swelling) with or without color changes. Skin color may be lighter at the edema site, because edema increases the distance between the skin surface and the pigmented layers and vessels beneath.
- Injured skin or skin with a stage I pressure ulcer may show low resilience. Document tissue resilience if the injured area is less stiff, boggier, or mushier than surrounding skin.
- Bruised skin may appear darker than surrounding areas. It may be sensitive or tender to the touch or it may be hard or lumpy.

Other assessment hints

- Know that in a healthy person, the skin generally has a sheen or depth of color. In an ill person, it generally appears dull, losing its sheen and color richness.
- Be aware that some dark-skinned patients, particularly those of Mediterranean descent, normally may have bluish lips and mucous membranes.
- Jaundice is easiest to recognize in unpigmented areas such as the sclera. If the patient is wearing yellow clothing, remove it before assessment.
- Pallor in patients with dark skin is visible in the conjunctiva and oral mucosa, appearing gray, white, or ashen.

To provide high-quality care for dark-skinned patients, healthcare professionals shouldn’t use skin assessment standards based on light skin color. We must increase the body of knowledge pertaining to appropriate methods for assessing skin colors along the entire continuum. Until all healthcare disciplines practice color awareness, we may be promoting healthcare disparities based on skin color. We can’t afford to be “color-blind.”

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