



Skin Assessment in Patients with Dark Skin Tone

Information and recommendations to counter a curricular blind spot.

ABSTRACT: There is a scarcity of nursing literature, studies, and educational materials on the assessment and early recognition of both common and serious integumentary and general health issues in people with dark skin tones. Nurses must be exposed to such learning resources to be adequately prepared to care for patients with diverse skin tones and to help reduce health disparities and promote health equity. This article provides faculty, nursing students, and clinicians with basic information about the assessment of dark skin tone and calls for action in academia and professional practice to ensure nurses and nursing students can effectively perform skin assessments in all patients.

Keywords: dark skin tone, health inequities, nursing education, skin assessment

Editor's note: The authors acknowledge that race is a social construct and not equated with skin tone, which is genetically determined, reflecting the amount of melanin in a person's skin. Research about skin assessment in patients with dark skin tone, however, has historically focused on race and ethnicity. The limitations of this research, some of which is cited in this article, is recognized, as is the need for continued discussions to achieve consensus in this area of research.

Health care providers are expected and required to deliver competent care to a U.S. population that is increasingly becoming more ethnically and racially diverse.^{1,2} The U.S. Census Bureau estimates the non-Hispanic White population will contract in the coming years, from 199 million people in 2020 to 179 million in 2060.¹ Concurrently, the U.S. population is rapidly becoming more diverse: in 1990, one in five people belonged to a racial population other than White, and within a decade it was one in four; by 2060, approximately one-third of the population is projected to be non-White.¹ The “multiracial” populace (people who self-identify with two or more races) has grown from 9 million in 2010 to 33.8 million in 2020, according to the Census Bureau.³ By 2044, more than half of Americans are expected to identify with a racial group other than non-Hispanic White.⁴

Health educators must reevaluate their teaching methods to avoid reinforcing stereotypes and biases about racially and ethnically diverse patients and those who have dark skin tone.^{5,6}

People of color experience health disparities⁷ and poorer-quality health care and outcomes.^{8,9} The myriad causes of these disparities, inequalities, and injustices are deeply rooted in the policies and structures of our society, including within the health care education and delivery systems.⁹ A systemic review by Maina and colleagues found implicit biases by health care providers against people who were Black, Hispanic, American Indian, and had dark skin.¹⁰ In another systematic review, Hall and colleagues found that most health care providers have implicit bias that negatively affects people of color and those who have dark skin tone.¹¹ The researchers concluded there is a significant association between implicit bias and patient outcomes, interactions between patients and providers, and treatment decisions and adherence.¹¹

A CURRICULAR BLIND SPOT

There is a scarcity of nursing literature, studies, and educational materials on the assessment and early recognition of both common and serious integumentary issues in people who have dark skin tones. Medical textbooks often include photos and images of racially diverse people but frequently lack images of people who have dark skin tones, especially in sections about skin assessment. In one study of textbook images, researchers reported that the images didn't approximate the skin tone distribution of the U.S. population, citing a 2012 estimate that 63.4% of the population had light skin tone and 11% had dark skin tone.⁵ The researchers noted that the percentage of individuals by skin tone in preclinical

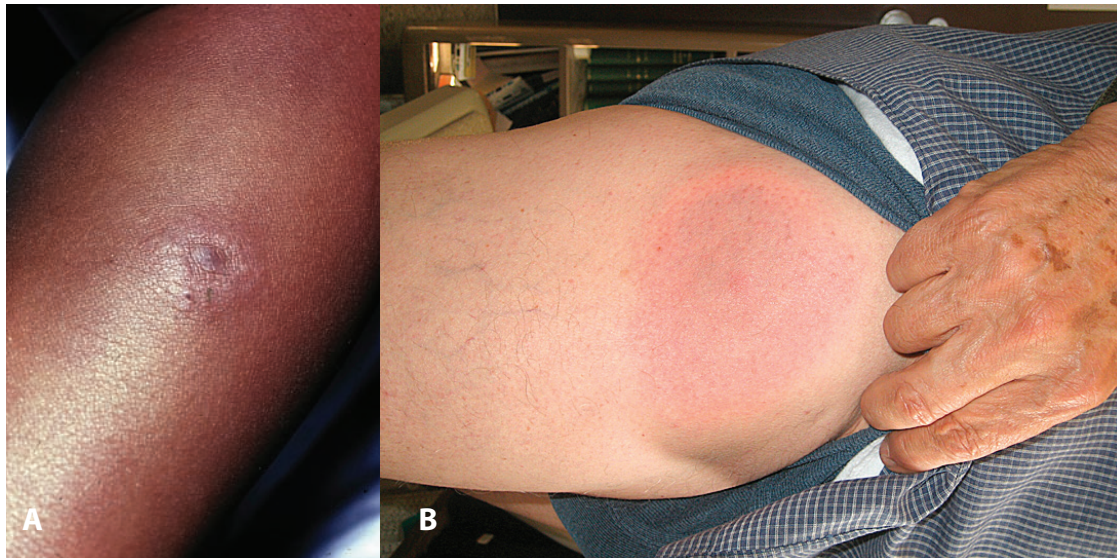


Figure 1. An erythematous nodule representing an early, expanding erythema migrans on the lower leg of a person with dark skin tone (A), and an enlarging erythema migrans on the upper thigh of a person with light skin tone (B). Photos reprinted from Bhate C, Schwartz RA. Lyme disease: Part I. Advances and perspectives. *J Am Acad Dermatol* 2011;64(4):619-38, with permission from Elsevier.

medical textbook images was 4.5% for dark skin tone and 74% for light skin tone.⁵ We found no such studies in the nursing literature.

The omission of images showing dark skin tone in educational resources may lead to health care provider bias.⁵ The lack of representation of people with dark skin tone in health care education and learning resources further exacerbates existing inequities.¹² Representation of dark skin tones in educational materials is essential for validating, normalizing, and embracing diverse skin tone. Additionally, all health care providers must be prepared to accurately assess and treat people who have a diverse range of skin tones.

Yet, nurses cannot learn to effectively assess and detect common skin changes in all patients when there is a dearth of images and information in textbooks and dermatology resources depicting alterations in dark skin tone. This article addresses this gap in nursing education and describes the basic knowledge and skills nurses need to perform skin assessments in all patients.

SKIN TYPE CLASSIFICATION

Dermatologists, health care providers, and wound, ostomy, and continence nurses use several scales and classification systems to describe skin response to ultraviolet (UV) radiation. One of the most commonly used is the Fitzpatrick scale, which describes

the six Fitzpatrick Skin Phototypes (FSPs), from type I (white) to V (brown) and VI (black).¹³ In this article, dark skin tone is defined as FSP V and FSP VI, with recognition that skin type classification may change based on exposure to UV radiation.

CLINICAL CONSIDERATIONS

Some common changes to the skin (pallor, cyanosis, jaundice, flushing) are not easily detectable when assessing people who have dark skin tones (see Figure 1).¹⁴ Skin tone and pigmentation are regulated by melanogenesis, a complex process directly linked to genetics. Melanocyte cells in the skin produce melanin pigment.¹⁵ It's important to understand that a person has constitutive (genetically acquired) and facultative (produced by the influence of UV and environmental factors) pigmentation.¹⁶ Although the color of the skin may change due to UV exposure, a person's FSP classification does not.^{16,17} Skin tone is best assessed in areas of the body that are not frequently exposed to UV radiation.

HEAD-TO-TOE ASSESSMENT

Nurses visually inspect the skin to help assess perfusion, oxygenation, injury, and trauma. The early detection of skin injuries or changes can affect patient management and outcomes. Differences in the appearance of "healthy" and "pathological" conditions in patients with dark skin tones can be

**Table 1.** Assessing Patients Who Have Dark Skin Tone

Alterations and Nuances	Findings and Recommendations
Cyanosis	The lips and tongue will be gray or white, whereas the palms, soles, conjunctiva, and nail beds will have a bluish tinge. These findings should prompt assessment for other indicators of hypoxia. ^{19,21}
Stage 1 pressure injury	There is no visible blanching response, and erythema might not be visible or detectable. ²² Inspect and palpate for additional skin tissue changes.
Deep tissue pressure injury	This injury might not be easily visible. Assess for preceding changes, such as pain and temperature change in the affected area. ²³
Inflammation	Inflammation can be subtle or unnoticeable to the naked eye. Skin areas with recently resolved inflammation appear darker than the patient's normal skin tone. The following techniques can be used: compare and contrast an affected and nonaffected area for increased warmth, skin color changes, and texture; examine the affected area for shine, tautness, and pitting edema with pressure; and palpate for differences in texture. ^{20,24}
Petechiae	On darkly pigmented skin, petechiae are rarely visible. They may be visible in the oral mucosa or conjunctiva. ²⁰
Skin irritation and erythema	This may present as inflammatory or postinflammatory hyperpigmentation (affected area darker than the surrounding skin tone). ²²
Ecchymoses	Areas appear darker than a person's usual skin tone; they may be tender and easily palpable, depending on whether a hematoma is present. ²¹
Pallor	Inspect the mucous membranes for an ash gray color, using ambient lighting or a halogen lamp. Because of decreased blood flow to the skin, brown skin appears yellow-brown, and very dark brown or black skin appears ash gray. ²¹
Jaundice	Inspect the oral mucosa, especially the hard palate, for yellow discoloration. ²¹ For a more accurate determination of jaundice, examine the sclera closest to the cornea. Be aware that if the palms and soles have callouses, they may appear yellow even when jaundice is not present. ²⁰
Nails	Melanonychia, dyschromia, or chromonychia (discoloration or hyperpigmentation of the distal matrix of the nail bed) is present in 75% of people who have dark skin tone. When assessing for abnormalities, ask the patient if they have had rapid hyperpigmented changes or new onset hyperpigmentation, widening hyperpigmented stripe, triangular pigmented shape, and dystrophy of nails. ²⁵

subtle and thus missed by nurses if they don't know how to identify the variations.¹⁷ In addition, because of the quantity of melanin and melanogenesis in people who have dark skin tone and the black-brown hue produced when injuries occur, inflammatory hyperpigmentation—not erythema (redness)—may be present.¹⁸ (For more information, see Table 1.¹⁹⁻²⁵)

Nursing programs need to ensure that education on the appraisal of skin changes includes information about manifestations in dark skin tones. These changes may include pallor associated with anemia, cyanosis associated with hypoxemia, erythema associated with burns and other inflammatory injuries, and jaundice associated with increased bilirubin levels.²⁶ Visual assessment alone is unreliable. When assessing a person who has dark skin tone, it's not

acceptable to only use the light and fair skin assessment guidelines and definitions, such as the National Pressure Injury Advisory Panel (NPIAP) guidelines, as standards for care. Although the revised NPIAP guidelines indicate that a stage 1 pressure injury presents differently in darkly pigmented skin tones, they stop short of describing how these differences manifest in people who have dark skin tone.^{22,23} The nurse should assess the patient's skin using appropriate lighting, such as ambient or natural (sunlight) lighting or a halogen lamp. Fluorescent lighting should be avoided because it gives off a bluish tint and may alter the appearance of the skin's true color.^{19,27} It's always imperative that nurses compare the affected area to a nonaffected site to assess for skin changes.



Figure 2. Erythema migrans on a patient with dark skin tone (A) and light skin tone (B). Photos courtesy of the Centers for Disease Control and Prevention / Gary Wormser (A) and James Gathany (B).

As noted above, in people who have FSP V or VI, skin injury or inflammation doesn't appear as erythema, as it does in those who have lighter skin tones. Instead, in people who have darker skin tones, injury or inflammation may occur as hyperpigmentation or slightly to significantly darker than the surrounding skin (see Figure 2). In these patients, cyanosis may present circumorally as grayish or white.¹⁹ Similarly, the conjunctiva may also appear gray or whitish in color.^{19,28} Pallor associated with anemia can present as paleness in the conjunctiva and mucosa around the mouth rather than in other areas, such as on the skin of the limbs.¹⁹

Assessment of stage 1 and deep tissue pressure injuries. Nonblanching erythema associated with early-stage pressure injuries in a person with dark skin tone is not readily recognized by visual cues. As noted above, these changes have not always been effectively described in skin assessment protocols or standard definitions of common skin alterations.^{19,27} The NPIAP, for instance, defines a stage 1 pressure injury as “intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pig-

mented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury.”²⁹ Yet these color descriptions don't apply to people who have dark skin tone, in whom no visible sign may be present, or the skin might present as darker than the surrounding skin tissue and may be taut or indurated and have changes in sensation and temperature.^{29,30} In addition, localized irritation, inflammation, injury, and trauma may not be visible to the naked eye or might present as inflammatory or postinflammatory hyperpigmentation (see Figure 3).¹⁹ Thus, a nurse needs to touch (using tactile skills) the affected site to ascertain additional data (such as changes in localized temperature, pain, discomfort, and induration). Additionally, dark skin tone assessment should be conducted using indirect rather than direct lighting, which projects on an object from a single light source.^{31,32} In the case of injury and trauma, as ecchymosis (bruising) develops in dark skin tone, the area becomes darker in color than the surrounding tissue, and palpation might

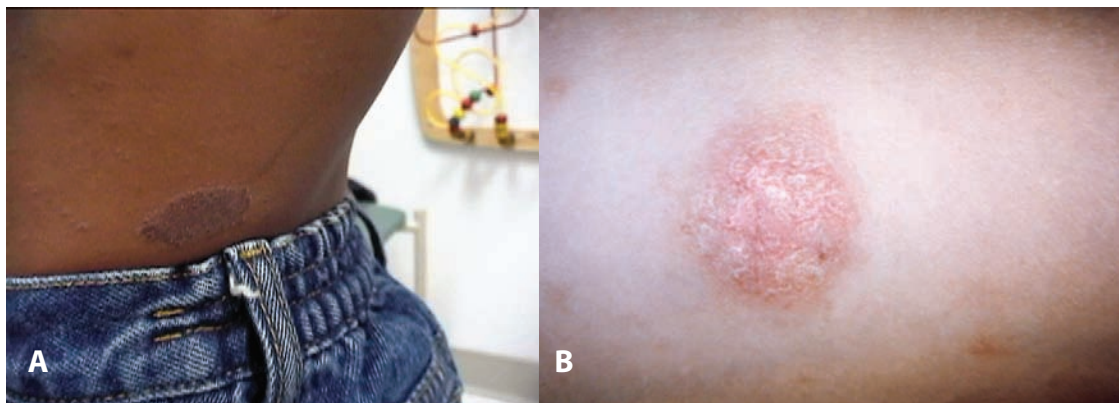


Figure 3. A herald patch, indicating pityriasis rosea, on a patient with dark skin tone (A) and light skin tone (B). Photos used with permission from Ahdi Amer, MD (A) and courtesy of the Centers for Disease Control and Prevention / Emory University, Dr. Thomas F. Sellers (B).

reveal discomfort and edema that should prompt further examination.¹⁹

Gerardo and colleagues studied residents of a nursing home and found that non-Hispanic Black residents were more likely to develop stage 2 to 4 pressure injuries than non-Hispanic White residents (12.1% versus 7.6%).³³ Harms and colleagues reported that Black patients admitted to nursing homes had “the highest prevalence of Stages 2-4 [pressure injuries] combined,” followed by newly admitted Hispanic residents; the lowest prevalence was among White patients.³⁴ The researchers attribute this difference to pressure injuries not being caught at stage 1. Hence, when assessing pressure injuries in people who have dark skin tone, it’s vital that nurses not rely only on visual assessment skills to identify stage 1 and deep tissue pressure injuries.

Assessment of dark skin after sexual assault.

Researchers have found that injuries to women who have dark skin are not easily visible during forensic sexual assault examinations.³⁵ Sommers and colleagues conducted a study of 120 healthy women (63 Black women, 57 White women) who were examined after consensual sexual intercourse.³⁵ They found that 56% of White women compared with 24% of Black women were found to have external genital injuries when assessed, a significant difference in prevalence. The researchers noted that “dark skin color rather than race was a strong predictor for decreased injury prevalence” and concluded that assault forensic examiners may not be able to readily detect injuries in women with dark skin tone.³⁵ These findings highlight both the medical and legal implications of not being able to confirm

genital injuries: a potential failure to detect and treat a person’s injuries and to document these injuries, which could influence decisions about reporting the assault, as well as prosecution and conviction.³⁵

Assessment of cancer in dark skin tone. Many people have the misconception that skin cancer risk is linked to skin tone; for example, that people with light skin tone have the highest risk and those with dark skin tones the lowest risk.³⁶ Although some evidence suggests melanin offers some natural protection against skin cancer that can arise from sun-related exposure, people who have dark skin tones are still diagnosed with these skin cancers. In addition, correlating dark skin tone with a lower risk of skin cancer could cause health providers to underestimate a person’s risk of skin cancer and lead to a worse prognosis for a person with dark skin tone who has skin cancer (due to a delayed diagnosis, for example).³⁶⁻³⁸ Squamous cell carcinoma is the most common type of skin cancer in Black Americans, and basal cell carcinoma is the second most common type.^{39,40} Both squamous cell carcinoma and basal cell carcinoma have been linked to UV exposure.⁴⁰ Although people who have dark skin tones are least likely to be diagnosed with melanoma, they have a greater risk of mortality.⁴¹ From 2000 to 2018, non-Hispanic Black patients who had melanoma of the skin were found to have lower one-year (90%), five-year (69.9%), and 10-year (63.3%) survival rates compared with non-Hispanic White patients (97.4%, 92.2%, and 90.4%, respectively).^{42,43} Though there are likely multiple reasons for this, a leading cause may be that people who have dark skin tone (and potentially their

health care providers) don't consider screening for melanoma to be a priority.^{39, 41}

Nurses need to be aware that in people who have dark skin tone, cancer may appear on areas of the skin, such as the soles of the feet, that are typically less frequently exposed to the sun, making detection more elusive.³⁸ It's important to ask patients if they have noticed any minute skin changes and closely examine papules, nodules, and hyperpigmented and hyperkeratotic areas during the assessment (hyperkeratotic lesions are not cancerous but should be evaluated carefully because of a similar appearance to squamous cell carcinoma).³⁸

Effective use of technology. Various technologies—including thermography, alternative light sources, ultrasound, subepidermal moisture measurement, laser Doppler, and spectrophotometry—can be used to enhance nurses' ability to assess a patient for skin injuries and detect any changes in the skin.⁴⁴ To be useful in clinical practice, these technologies must be readily available, nurses must receive education in their use, and in the case of some devices, frequent calibration and maintenance may be needed to ensure they function effectively.⁴⁴

Today, it's common for nurses to use high-resolution digital photography to capture images of pressure injuries. Cameras can be affordable alternatives to other diagnostic technology. Natural, indirect lighting should be used to obtain an image that can be of assistance in assessing dark skin tone alterations.³¹ The usefulness of the image obtained depends on how adequately nurses are trained in the use of photography and whether they follow basic best practices for obtaining quality images.⁴⁵ When photos of patients who have dark skin tone are saved in the electronic health record, the nurse should ensure the photo was taken with appropriate lighting and the area of concern is clearly marked, so collaborating clinicians can be informed of the issue.

It's crucial that nurses combine keen assessment skills with knowledge about both the use of technology and its potential impact on the detection of skin alterations in people who have dark skin tone. Recent studies have noted that pulse oximeter readings overestimate oxygen saturation levels in people of color compared with White people, leading to less administration of supplemental oxygen and additional interventions.⁴⁶⁻⁴⁹ Fawzy and colleagues posit that pulse oximeters failed to detect hypoxemia in Asian, Black, and non-Black Hispanic patients who had COVID-

Resources for Imagery of Common Alterations in Dark Skin Tone

Book

Kelly AP, et al. *Taylor and Kelly's dermatology for skin of color*. 2nd ed. New York, NY: McGraw-Hill Education; 2016.

Guidelines

The National Pressure Injury Advisory Panel Staging Cards for Lightly and Darkly Pigmented Skin^a
<https://npiap.com/store/viewproduct.aspx?id=16084665&hhSearchTerms=%22dark+and+skin%22>

Staging for Dark Skin Tones^a

<https://npiap.com/store/viewproduct.aspx?id=16408275&hhSearchTerms=%22dark+and+skin%22>

Organizations

American Academy of Dermatology Association
www.aad.org

Dermatology Nurses' Association
www.dnurse.org

Wound, Ostomy, and Continence Nurses Society
www.wocn.org

^a Available for purchase.

19, potentially contributing to worse outcomes during the pandemic.⁴³ These findings of oxygen saturation level overestimates are not new,^{50, 51} pointing to the continued need to investigate, understand, and correct technology when needed—and to highlight these findings in teaching and practice.

NORMALIZING DARK SKIN TONE IN EDUCATION AND PRACTICE

Ongoing clinical inquiry, continuing education, and clinical orientation enable nurses to develop a thorough assessment approach to properly care for all patients. Nurse educators should intentionally embed images that depict dark skin tone and content in the foundational curriculum.

Teaching about the nuances and subtleties that indicate a serious skin injury in someone with dark skin tone must be well-established in nurses' education and in practicing nurses' yearly competencies.¹⁴

U.S. population demographics necessitate the need to normalize dark skin tone in nursing educational content, and educators and clinicians need to actively and systematically collaborate to



share access to images of even the most common skin alterations to close the existing gap in education and practice. Nurse educators must provide greater access to high-quality imagery, photographic equipment, simulation cases, and dark skin tone manikins in the clinical skills laboratory. Clinicians need to intentionally seek resources from experts in dark skin tone and skin centers as a standard of practice.^{52, 53} (For more information, see *Resources for Imagery of Common Alterations in Dark Skin Tone*.) Current normative terms—including use of words such as “pink,” “mottled,” “red,” and “blanch”—must represent only a part of the language used in the curriculum if nurses are to become skilled in

Nurse educators should intentionally embed images that depict dark skin tone and content in the foundational curriculum.

assessing the skin of patients who have diverse skin tones. Any definition of skin alterations that omits descriptions of changes in dark skin tone needs to be corrected by leading organizations and in educational materials to ensure nurses gain the same knowledge and skill set to assess and care for all patients. ▼

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