

## Clinical Images

# Presentations of Cutaneous Disease in Various Skin Pigmentations: An Introduction

Christian J. Scheufele, DO<sup>1,2</sup>; Delfin Weis, MSc, MA<sup>3</sup>; Stephen E. Weis, DO<sup>1,2</sup>

Author affiliations are listed at the end of this article.

### Abstract

#### Description

Dermatological disease has historically been dependent on photography as a primary modality for education. Previously, photographs used for medical education were representative of the regional patient populations at that time; however, they have not proportionally reflected the rapidly changing demographics in the United States. Education on the diagnosis of cutaneous disease has, therefore, primarily relied on photographs of lighter skin tones. There is a need for a better representation of darker skin tones in dermatologic medical education. This article introduces a clinical series that highlights dermatological diseases in various skin pigmentations, which are commonly seen in the primary care office. The goal is to improve the diagnostic accuracy of primary care clinicians and to compare how certain cutaneous diseases may vary in appearance depending on the individuals' Fitzpatrick skin type.

Correspondence to:  
Christian Scheufele, DO  
University of North Texas  
Health Science Center  
855 Montgomery St.  
Fort Worth, TX 76107  
([christian.scheufele@unthsc.edu](mailto:christian.scheufele@unthsc.edu))

#### Keywords

dermatology; skin disease; primary care; cutaneous disease; skin; skin of color; ethnicity; race; demographics; demographics in medicine; demographics in dermatology; dark skin; light skin; skin tones

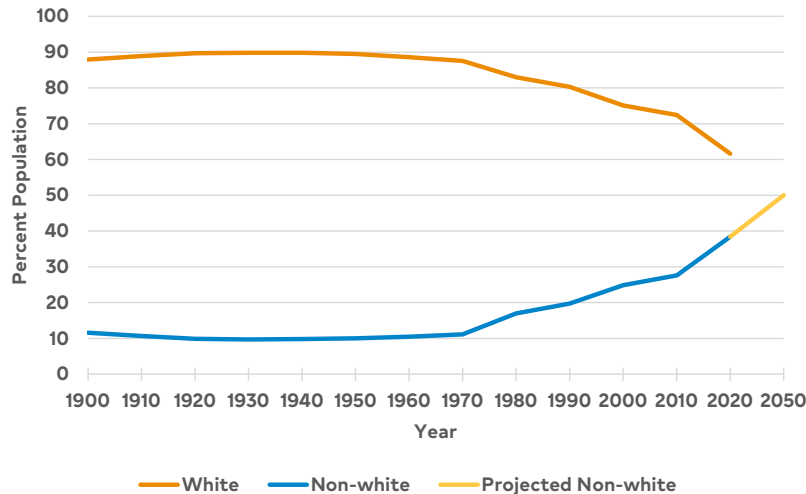
## Introduction

The goals of medical care are to relieve suffering, promote health, and prevent disease.<sup>1</sup> Accurate diagnosis and prompt treatment are necessary to attain these goals. Modern healthcare system burdens can hinder these objectives. Primary care clinicians are under increasing pressure to see patients rapidly and to maintain proficiency in many different aspects of medicine. Although cutaneous disease is common in primary care, dermatological training for both medical students and primary care residents has been historically lacking. Studies have estimated that dermatologic complaints comprise approximately 25% of all outpatient visits; and primary care providers treat about 60% of all patients presenting with a skin-related problem.<sup>2</sup> The increasing pressure put upon primary care providers to see more patients in less time requires the general practitioner to effectively recognize and treat common dermatological diseases.<sup>2</sup>

## Disparities in the Use of Visuals for Dermatology Diagnostics

The development of photography has improved diagnostic accuracy in the visual field of dermatology. The first photographic catalog of dermatologic disease was *Clinique photographique de L'hôpital Saint-Louis* in 1868 by Alfred Louis Philippe Hardy.<sup>3</sup> Since then, dermatology has increasingly relied on photographs to educate clinicians on skin diseases. A few decades ago, photographs of skin disorders became synonymous with the film they were produced on, Kodak Kodachrome film. The "Kodachrome" has continued into modern education as a digital image of dermatologic pathology for training purposes. Kodachromes of different skin diseases allow medical trainees to better acquaint themselves with skin conditions, which may have dozens of different presentations.

The teaching Kodachromes in medical textbooks primarily demonstrate dermatologic



**Figure 1.** United States population percentages based on reported race to the U.S. Census Bureau from 1900 to 2020 and projected change in reported “non-white” race in 2050.

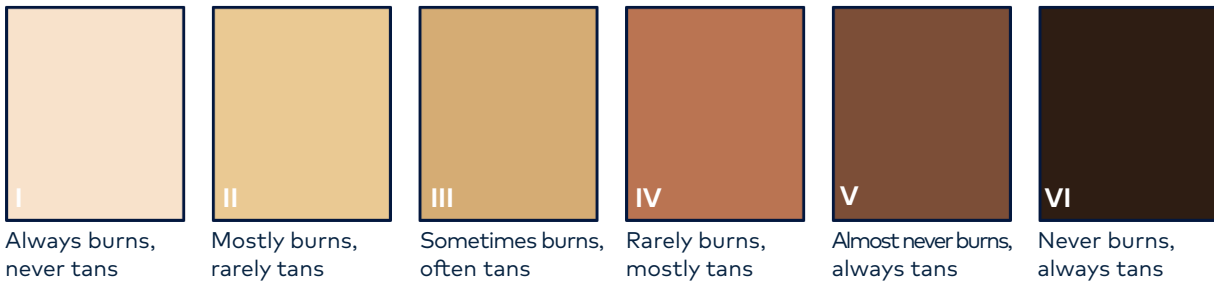
diseases in fair-skinned individuals representing the majority of the United States population. A review of modern dermatology textbooks and other teaching tools reveals that non-white skin images comprise only 4% to 20% of all skin photographs.<sup>4</sup> These low percentages of non-white skin images do not proportionally reflect the current demographics in the United States (**Figure 1**). In 1980, 17% of the United States population reported being a race other than White, non-Hispanic. The 2020 United States Census showed that this number had increased to approximately 40%.<sup>5</sup> Hispanic ethnicity, which is recorded separately from race, demonstrated an increase from 6% in 1980 to 19% in 2020. The United States Census Bureau predicts that the current trend of skin melanin heterogeneity will continue such that approximately 50% of the population will be non-Caucasian by the year 2050.<sup>6</sup> The underrepresentation of darker skin tones in teaching photographs may lead to misdiagnosis or delayed diagnosis of dermatologic conditions.<sup>7</sup> Therefore, it is thus important to develop a comprehensive understanding of how varying skin tones may present identical pathologies differently.

## A Better Description of Skin Tones

As we designed this clinical image series, we realized the importance of the correct language used to describe different skin tones. The field of dermatology developed within a Eurocentric scientific and socio-cultural frame-

work.<sup>3</sup> Historically, terms such as “ethnic skin” or “native skin” can be found in the European medical literature. These antiquated terms framed darker skin as an alternative to that of normalized “lighter” skin.<sup>8</sup> Further complicating and confounding this comparison is the conflation by dermatologists of race and ethnicity with skin color.<sup>9</sup> More recently, color descriptors such as “white skin,” “black skin,” or “brown skin” have been used to identify different skin types. The current terminology, “skin of color,” is typically used as a catch-all historically for non-European skin types. This terminology is also not ideal because of the implication that light skin, i.e. less melanic skin, is “normal.” It also implies that melanic or non-European skin color is a deviation from the normal.<sup>6,10-11</sup>

We believe that categorizing skin types into “white skin” and “skin of color” inadequately captures the number and diversity of cutaneous pigments of the human species. In this series, we felt that the Fitzpatrick scale is the best available categorization system for skin tones rather than vague and often confusing terminology. The Fitzpatrick scale was developed in 1975 as a tool for determining the level of tanning vs. burning of an individual’s skin in response to ultraviolet light exposure (**Figure 2**). The scale is composed of 6 different types, beginning with very fair skin, and ending with black skin. Type I always burns, never tans. Type II usually burns, tans minimally. Type III sometimes burns, tans uniformly. Type IV burns minimally, always tans. Type V very rarely burns,



**Figure 2.** A representation of the Fitzpatrick phototyping scale.

tans very easily. Type VI never burns. This phototyping system is applied to describe sun-related dermatologic diseases. The level of innate photoprotection correlates with increased skin pigmentation and an increased Fitzpatrick score.<sup>14</sup> The Fitzpatrick scale approximates skin color but it is not an ideal characterization because an individual’s skin pigmentation can vary greatly in response to ultraviolet light exposure. Therefore, more accurate skin color scales need to be developed in the future.

## Conclusion

The goal of this series is to improve dermatologic diagnosis by clinicians in primary care disciplines such as family medicine, internal medicine, pediatrics, and obstetrics and gynecology. To optimize dermatologic training, images should contain various skin shades affected by the same disease. Therefore, each article will highlight a common dermatologic disease seen in the primary care setting with an emphasis on its appearance in multiple Fitzpatrick skin types. The treatment of skin disorders will not be covered in this series. We hope this series broadens the reader’s perspective on dermatologic diagnosis and aids them in relieving suffering, promoting health, and preventing disease in their patients.

## Conflicts of Interest

The authors declare they have no conflicts of interest.

Drs Scheufele and Weis are employees of Medical City Fort Worth, a hospital affiliated with the journal’s publisher.

This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views

expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

## Author Affiliations

1. University of North Texas Health Science Center at Fort Worth, Fort Worth, TX
2. Medical City Fort Worth, Fort Worth, TX
3. SWCA Environmental Consultants, Houston, TX

## References

1. Callahan D. Managed care and the goals of medicine. *J Am Geriatr Soc.* 1998;46(3):385-388. doi:10.1111/j.1532-5415.1998.tb01060.x
2. Lowell BA, Froelich CW, Federman DG, Kirsner RS. Dermatology in primary care: prevalence and patient disposition. *J Am Acad Dermatol.* 2001;45(2):250-255. doi:10.1067/mjd.2001.114598
3. Ferreira IG, Weber MB, Bonamigo RR. History of dermatology: the study of skin diseases over the centuries. *An Bras Dermatol.* 2021;96(3):332-345. doi:10.1016/j.abd.2020.09.006
4. Ebede T, Papier A. Disparities in dermatology educational resources. *J Am Acad Dermatol.* 2006;55(4):687-690. doi:10.1016/j.jaad.2005.10.068
5. Jensen E, Jones N, Rabe M, et al. The chance that two people chosen at random are of different race or ethnicity groups has increased since 2010. *Census.gov.* August 12, 2021. Accessed January 24, 2022. <https://www.census.gov/library/stories/2021/08/2020-unit-ed-states-population-more-racially-ethnically-diverse-than-2010.html>
6. Nijhawan RI, Jacob SE, Woolery-Lloyd H. Skin of color education in dermatology residency programs: does residency training reflect the changing demographics of the United States?. *J Am Acad Dermatol.* 2008;59(4):615-618. doi:10.1016/j.jaad.2008.06.024

7. Lester JC, Taylor SC, Chren MM. Under-representation of skin of colour in dermatology images: not just an educational issue. *Br J Dermatol*. 2019;180(6):1521-1522. doi:10.1111/bjd.17608
8. Norton HL. The color of normal: how a Eurocentric focus erases pigmentation complexity. *Am J Hum Biol*. 2021;33(5):e23554. doi:10.1002/ajhb.23554
9. Ware OR, Dawson JE, Shinohara MM, Taylor SC. Racial limitations of Fitzpatrick skin type. *Cutis*. 2020;105(2):77-80.
10. Alvarado SM, Feng H. Representation of dark skin images of common dermatologic conditions in educational resources: a cross-sectional analysis. *J Am Acad Dermatol*. 2021;84(5):1427-1431. doi:10.1016/j.jaad.2020.06.041
11. Cline A, Berk-Krauss J, Keyes Jacobs A, et al. The underrepresentation of "COVID toes" in skin of color: an example of racial bias or evidence of a tenuous disease association?. *J Am Acad Dermatol*. 2021;84(2):e91-e92. doi:10.1016/j.jaad.2020.11.003
12. Dyson GA. *Examining the Presence of Racial Bias in Dermatology Education and Its Reproduction in Practice*. Master's thesis. Vanderbilt University; 2021. <http://hdl.handle.net/1803/16881>
13. Kim Y, Miller JJ, Hollins LC. Skin of color matters: a call to action. *J Am Acad Dermatol*. 2021;84(6):e273-e274. doi:10.1016/j.jaad.2020.11.026
14. Roberts WE. Skin type classification systems old and new. *Dermatol Clin*. 2009;27(4):529-viii. doi:10.1016/j.det.2009.08.006