

Considerations for the Use of Fitzpatrick Skin Type in Plastic Surgery Research

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Fitzpatrick skin type (FST) is the most commonly used skin tone classification system. Developed in 1975, FST was originally designed to categorize White patients' skin tones based on their propensity to burn and/or tan in the sun. Later, the system was expanded to account for non-White patients (Table 1). FST is now used to assess everything from skin cancer risk to the efficacy of laser hair removal.¹

FST has increasingly been used in plastic and reconstructive surgery research. Patients with higher FST experience higher rates of keloids, hypertrophic scarring, and dyspigmentation following surgery.⁴ Patients with higher FST also experience worse surgical outcomes. For example, one study found that patients with darker FST are more likely to experience flap loss following autologous flap breast reconstruction, potentially due to providers' inability to notice skin changes in patients with darker FST.²

Effectively measuring skin tone is vital to conducting health disparities research and improving surgical outcomes. Given the difficulty of recording racial data in electronic health records, FST has become a commonly used proxy for race/ethnicity. However, this use of FST may not be appropriate. The Fitzpatrick scale has been criticized by dermatologists for its subjective nature and development with an entirely White patient base, relying on terms like *burn* and *tan* that do not capture the effects of UV radiation on darker skin tones.^{3,5}

As part of a larger project investigating racial disparities in skin-related surgical outcomes, our team in the Department of Plastic and Oral Surgery at Boston Children's Hospital intended to use FST as an indicator of skin tone. However, of the 92 patient charts reviewed, only 34 (36.96%) had FST consistently documented (more than two times) across notes. Only 16 (17.39%) documented FST once across all notes, 14 (15.22%) were missing FST altogether, and 28 (30.43%) had multiple conflicting types documented. The inconsistencies in FST

Table 1. Fitzpatrick Scale: FST Descriptions Compiled from the Existing Literature¹⁻³

FST	Typical Skin Features	Reactions to Sun Exposure
I	Very fair white, extremely sensitive	Always burns, never tans
II	Fair white, very sensitive	Usually burns, tans minimally
III	Darker white to light brown, moderately sensitive	Sometimes burns, slowly tans
IV	Medium brown, mildly sensitive	Rarely burns, tans easily
V	Dark brown, relatively resistant	Seldom burns, tans darkly easily
VI	Deeply pigmented brown or black, resistant	Never burns, always tans darkly

reporting may reflect the overly subjective nature of FST assessments, particularly by surgeons without adequate training on the scale.

Surgical researchers should be aware of the current shortcomings of the FST system. Without consistent and accurate documentation, the use of FST in disparities research may lead to inaccurate findings and harm patient care. Surgeons should ensure that any measure of skin tone is consistently documented and accurately determined (eg, by assessing skin *reactivity* in the sun rather than specific propensities to burn or tan). Researchers should also recognize that FST only measures skin *tone* and cannot be conflated with race/ethnicity when assessing surgical outcomes.⁵

Whenever possible, surgeons should rely on more objective measures of skin tone, such as spectrophotometric assessments.³ Moreover, dermatologists have begun to call for alternatives to the FST scale, some of which (such as the Roberts Skin Type Classification System and Taylor Hyperpigmentation Scale) incorporate hyperpigmentation and scarring data that may be particularly useful for plastic and reconstructive surgeons.⁵ Surgical researchers should remain apprised of any developments in these alternative scales. Doing so will foster better research into skin-related disparities in plastic surgery outcomes and more effective treatment for patients of all skin tones.

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DISCLOSURE

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