



A147 Does Donor Skin Color Affect Total Body Scores (TBSs)?

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Learning Overview: After attending this presentation, attendees will understand how the discoloration categories used by Megyesi et al. are population specific, making early stage decomposition challenging to estimate in American Black, American Hispanic, and Native American individuals.¹

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the impact of skin tone on the assessment of the TBS in early decomposition and, therefore, the estimation of the Postmortem Interval (PMI) on People Of Color (POC).

Since its publication, Megyesi et al.'s method of using accumulated degree days and TBS has been widely used by anthropologists studying human decomposition and estimating the PMI.¹ Megyesi et al. advised that this research was preliminary, citing differential environments and temperature as the most important factors for future PMI research.¹ While the ancestral distribution of the Megyesi et al. sample is unknown, many of the coloration terms are specific to White individuals.¹ The purpose of this research is to ascertain if Megyesi et al.'s fresh and early stage discoloration terms, specifically the pink-white and gray to green categories, play a role in accurately estimating the TBS of individuals with darker skin tones.¹

This study utilized decomposition photographs for 23 POC (9 American Black, 12 American Hispanic, 2 Native American) and 21 American White individuals. The use of photographs to assess TBS has been previously validated.^{2,3} Each photograph was scored using the Megyesi et al. scores for the head and neck, torso, and limbs.¹ Discoloration, such as pink-white or gray to green, were included only in the early decomposition stages, and were the focus of this research. However, donor TBS were recorded until the end of the early decomposition stage, marked by post-bloating of the trunk. Deviations from the discoloration, outlined in Megyesi et al., were noted.¹ Additionally, discoloration had to occur on more than half of the body region to be scored as present. Using frequencies, these scores compared White individuals to POC.

In comparing scores for White and POC, several differences were observed. Individuals that were scored fresh (one point) or black-brown (six points) for the head-neck region did not stray from the listed definition. Similarly, points four and five (brown and brown-black/purging of the head-neck) matched the definitions by at least 95% for both POC and White individuals. The categories that strayed the most from scores and definitions were pink-white with skin slip (two points) and gray to green (three points). While 86.7% of White individuals matched the discoloration for the two-point category, only 21.4% of the POC's point scores agreed with the listed definition. Those whose discoloration was scored as gray to green agreed with the definition more than the pink-white discoloration category for both groups (100% for American White, 45.5% for POC). However, POC still did not match either the pink-white or gray to green discoloration definition most of the time they were scored.

A majority of the Megyesi et al. scoring system is inclusive for all individuals.¹ Regardless, the pink-white and gray to green discoloration categories within the early decomposition stage should be altered or based solely on other known and identifiable changes in decomposition. Terms such as "natural skin color" rather than "pink-white" and "color change" rather than "gray to green" may be more appropriate. Utilizing Megyesi et al.'s discoloration terms reduces the effectiveness of the TBS method.¹ As a result, the estimation of the PMI becomes more ambiguous.

Reference(s):

1. Megyesi, M., Nawrocki, S., Haskell, N. 2005. Using accumulated degree-days to estimate the postmortem interval from decomposed human remains. *Journal of Forensic Sciences* 50(3):1-9.
2. Dabbs G.R., Connor M., Bytheway J.A. 2016. Interobserver reliability of the total body score system for quantifying human decomposition. *Journal of Forensic Sciences* 61(2):445-451.
3. Wescott D., Steadman D., Miller N., Sauerwein K., Clemmons C., Gleiber D., McDanel C., Meckel L., Bytheway J. 2018. Validation of the total body score/accumulated degree-day model at three human decomposition facilities. *Forensic Anthropology* 1(3):143-149.

Total Body Scores, Decomposition, Discoloration