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Shoe size as a predictor for total knee arthroplasty component sizes in South African patients

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Title of Project: **SHOE SIZE AS A PREDICTOR FOR TOTAL KNEE ARTHROPLASTY COMPONENT SIZES IN SOUTH AFRICAN PATIENTS**.

Abstract

Background: For successful total knee replacement surgery to be carried without prior implant size templating; implant companies have to send multiple instrument trays containing different implant sizes for the surgeon to choose from. The effect of sending multiple trays means more autoclaving of trays, increased transportation requirements and ultimately an increase in the carbon footprint. Multiple trays in theatre also cause overcrowding, which can have a negative impact on maintenance of sterility and theatre efficiency. Our study was aimed at exploring an alternative method of templating where a surgeon simply uses a regression equation based on shoe size to predict total knee component sizes. The basis of this study is that the same has been proven in Western and Eastern populations. However, to the best of our knowledge, no such study has been done on an African population. What is unique about our study in a South African population is the diversity of South Africans in terms of race.

Methods: A total of 205 contactable patients who had total knee replacement done at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) between 2016 – 2019 were chosen for the study. Their shoe sizes were collected and a linear regression equation was generated (developed) to see if shoe size could be used as a predictor for total knee component sizes in South African patients. South African races included in the study were black African, Caucasian, mixed race and patients of Indian extraction. All selected patients included had a total knee replacement procedure done using the Smith and Nephew Gen 2 implants.

Results: We found a statistically significant correlation between shoe size and tibial component across all four groups. There was also a statistically significant correlation found in black African and Caucasian patients concerning femoral component size prediction. No statistically significant correlation was found between shoe size and femoral component in the mixed race group and patients of Indian extraction.

Conclusion: Shoe size is a good predictor for total knee component sizes in South African patients.

Keyword: Orthopaedic Templating: is a process where in surgeons using either acetate templates or digital templates estimate the correct size of the prosthesis to be used in surgery.