

**SHOULDER PROSTHESIS STEM DESIGN BASED ON ANTHROPOMETRIC  
MEASUREMENT DATA FOR ASIAN POPULATION**

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## ABSTRACT

The main indication for a shoulder replacement is pain relief. Occasionally, shoulder replacement surgery is needed for certain fractures around the shoulder, but most shoulder replacements occur after years of wear, tear and dislocation of the glenoid joint on the shoulder. The humeral head rarely can dislocate from the glenoid component because of the different mismatch sizes of prosthesis stem with the patient. The aim of this study is to see the implication of the Asian proximal humerus geometric to the previous shoulder prosthesis design and construct a possible size of shoulder prosthesis stem for Asian. The scope of this study is to perform the Finite Element Analysis on Asian and Caucasian shoulder with the implemented implant. The dimension of shoulder was based on previous Anthropometric measurement data. The shoulder prosthesis used in this study is a Zimmer Anatomical Shoulder Systems. It's the third generation of stem designs. The material was used is Titanium Alloy Ti-6Al-4V. The loading that has to be considered is muscle force at average body weight. The distal end of the humerus is fixed. Results, shows that the stress distribution of shoulder with implemented stem. Analysis of this shoulder is sufficient to study the stress behavior of the TSR on humerus bone. The stresses for the TSR on humerus bone were reduced at modified design size compared to existing design size.

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