



*Title*

**ANALYSIS OF VARIATION OF ADULT FEMORA  
USING SEX-SPECIFIC STATISTICAL ATLASES**

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*Purpose/Premise*

This analysis was conducted to quantify gender-specific differences in the size and shape of distal femurs.

*Material and Methods*

Comparisons were made using a statistical atlas for each gender. The atlases contained measurements for 92 males and 52 females and were compiled from sets of canonical shape instances created from a process that matches 3-D image data. Statistical techniques, such as principal component analysis, were then applied. These atlases provide information that can be used to calculate axes and angles that are relevant to orthopaedic surgeons.

*Outcomes*

The study showed significant shape differences ( $p < 0.05$ ) between male and female femurs.

*Conclusion/Recommendation*

The authors conclude that there are significant size and shape differences in femoral anatomy between male and female patients and that available knee systems do not adequately account for these differences. They suggest that these anatomical differences have extensive applications in the design of prostheses.

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