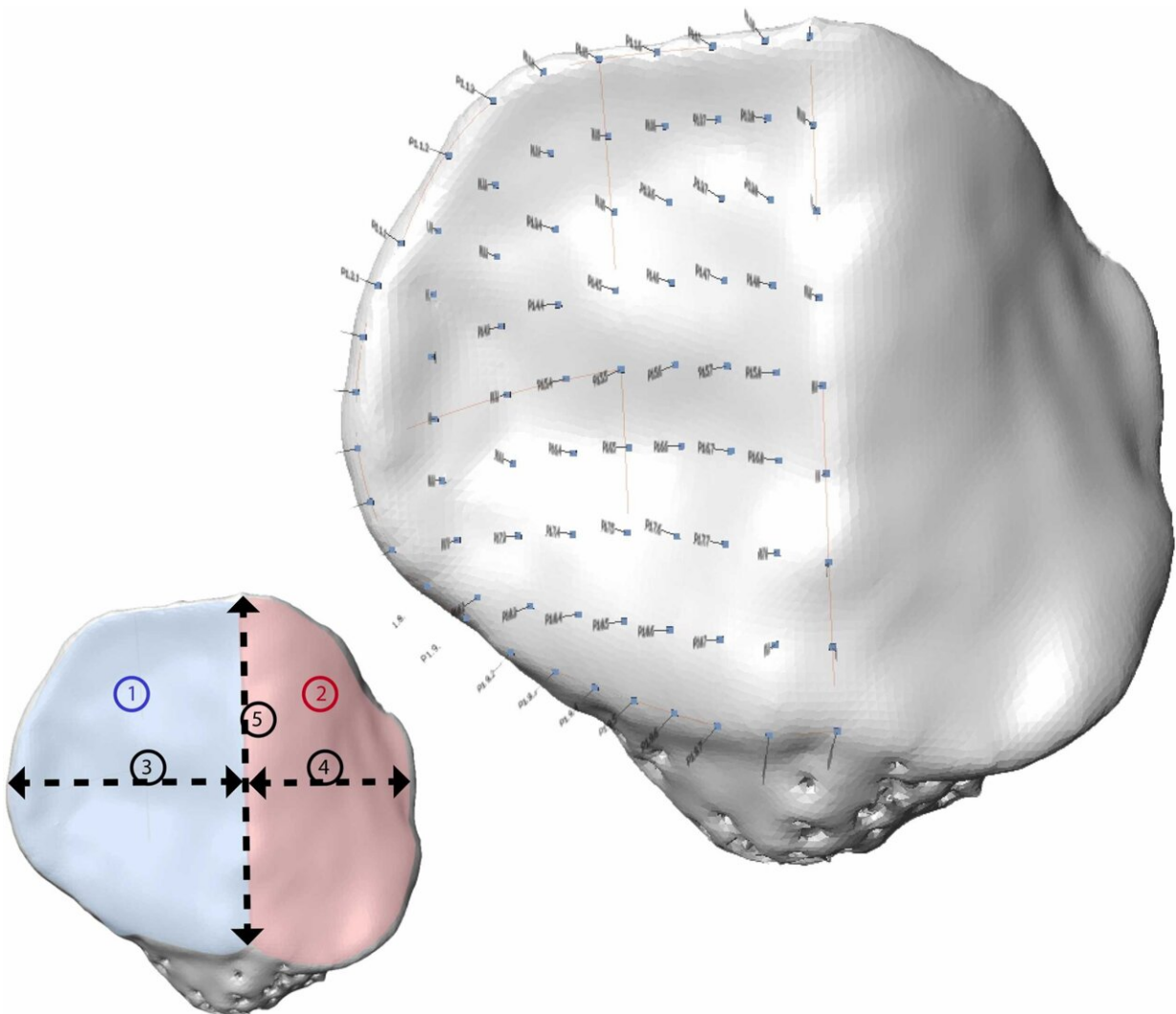


# Link found between kneecap shape and debilitating joint disease

July 24 2024



Overview of measurement protocols used in this study, showing a 3D virtual model of the patella bone in posterior view, segmented from CT data. Measurements (inset) are numbered in ellipses as follows: 1) lateral facet area, 2)

medial facet area, 3) maximum mediolateral width of the lateral facet, 4) maximum mediolateral width of the medial facet, 5) maximum anterior-posterior height of the patella, and maximum mediolateral width of the patella, i.e., (3)+(4). Credit: *Osteoarthritis and Cartilage* (2024). DOI: 10.1016/j.joca.2024.06.018

The shape of a person's kneecap could be an indicator of whether they're more at risk of developing osteoarthritis, according to a new study from The Australian National University (ANU) published in [\*Osteoarthritis and Cartilage\*](#).

According to lead author of the study, Associate Professor Laura Wilson, [women](#) who develop knee osteoarthritis often experience more [severe symptoms](#) than men, but the reason for this is not well understood. Osteoarthritis, the most common form of arthritis, is a debilitating joint disease that causes pain, stiffness and swelling.

The research team set out to investigate whether kneecap [shape](#) might be a contributing factor.

"We wanted to focus on the kneecap as a major contributor of pain for individuals with knee osteoarthritis," Associate Professor Wilson said.

"We know that some features of the femur, which forms part of the knee joint, are shaped differently in women compared to men, and we hypothesized that we might, similarly, find sex differences in kneecap shape."

The team, which includes former ANU Master's student Jo Ménard, along with researchers at ANU and The Canberra Hospital, collected CT scans from a large sample of healthy individuals and patients on the wait

list for [knee](#) replacement.

Using advanced image analysis techniques to create 3D models of hundreds of kneecap bones, the team then applied shape modeling methods to visualize and measure the shape of the surfaces of the kneecap in three dimensions.

While they didn't find unique features among the kneecaps of females compared to males, they did uncover variations in the surfaces of the kneecap that were more pronounced in individuals with osteoarthritis.

"What's surprising is that the different joint surfaces of the kneecap change shape in different ways with osteoarthritis, and as disease severity increases," Associate Professor Wilson said.

The team now plans to expand their study.

"We want to understand whether these shape differences in individuals with osteoarthritis start early on," Associate Professor Wilson said.

"If that's the case, then features of the kneecap might be added to disease prevention models, which could help identify people who are more at risk of [knee osteoarthritis](#) and could benefit from [early intervention](#)."

**More information:** Laura A.B. Wilson et al, Sex differences in patellar facet shape among healthy and osteoarthritic cohorts, *Osteoarthritis and Cartilage* (2024). [DOI: 10.1016/j.joca.2024.06.018](https://doi.org/10.1016/j.joca.2024.06.018)

Provided by Australian National University

Citation: Link found between kneecap shape and debilitating joint disease (2024, July 24)  
retrieved 24 July 2024 from <https://medicalxpress.com/news/2024-07-link-kneecap-debilitating-joint-disease.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.