



How does it shape up? Buttocks shape across wheelchair cushions.

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Overview

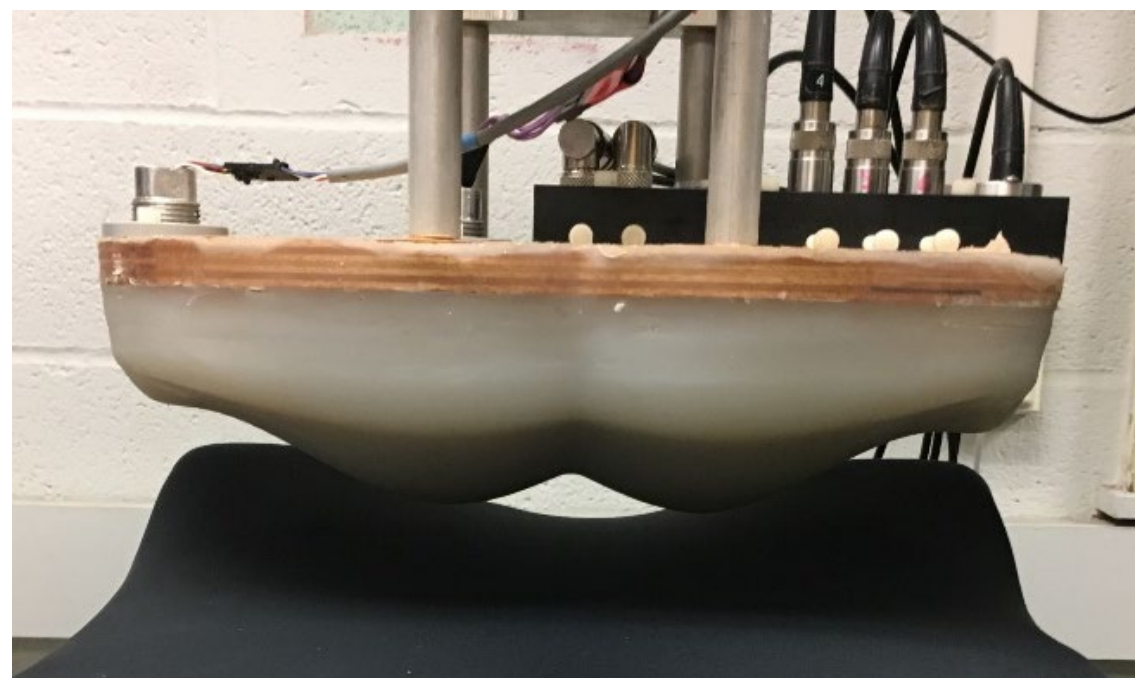
Shape Compliance is the ability of a cushion to support the buttocks with minimal buttocks deformation.

Biomechanical Risk is the intrinsic characteristic of an individual's soft tissues to deform in response to extrinsic applied force.

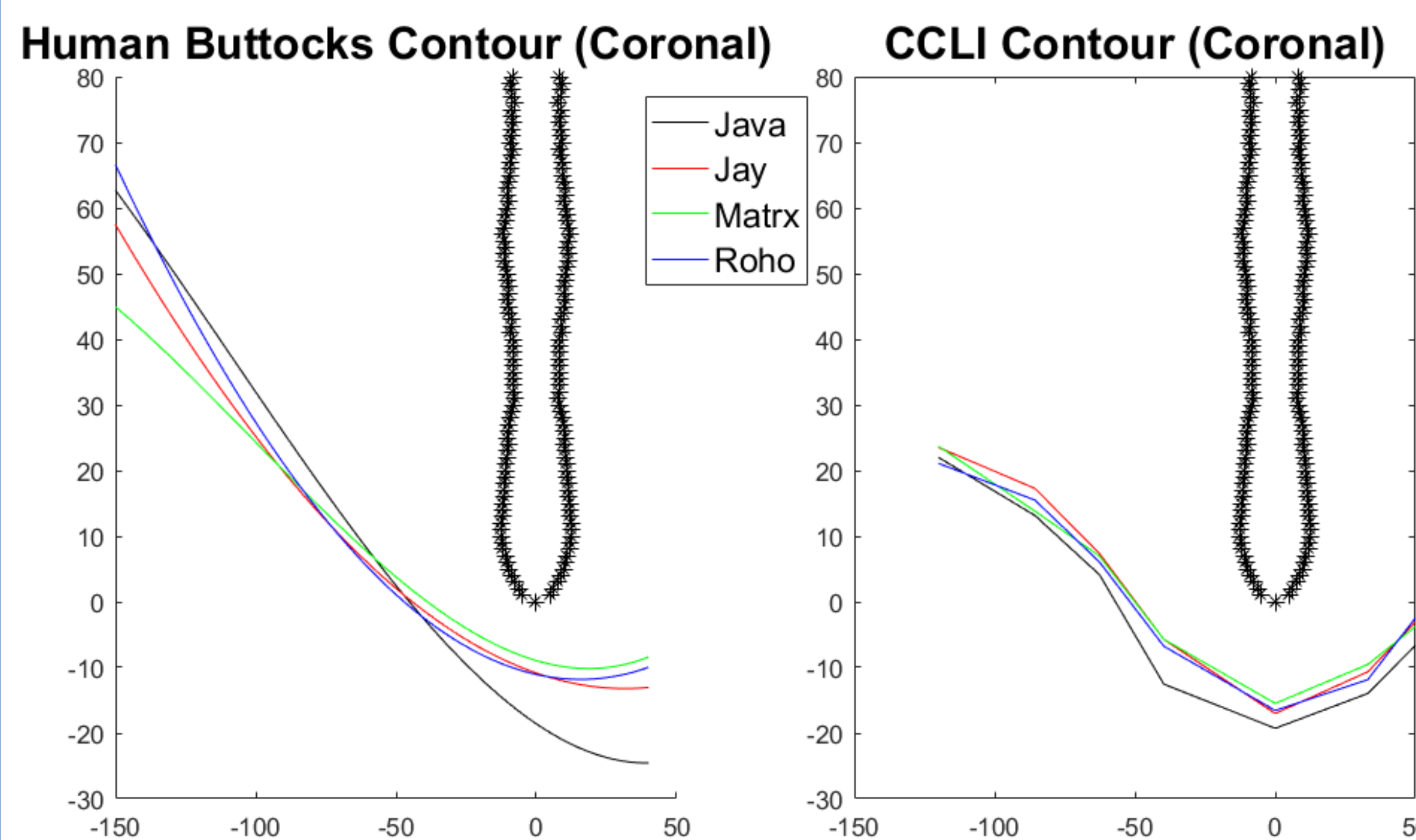
The objective was to describe the average contours of the human buttocks and of a compliant cushion indenter across different wheelchair cushions and across individuals of different levels of pressure ulcer risk.

Compliant Cushion Indentor (CCLI) Versus Human Testing

- CCLI tested with
 - 61 kgf (representing a 95 kg person)
 - Jay3, Roho HP, and Matrx Vi, Ride Java

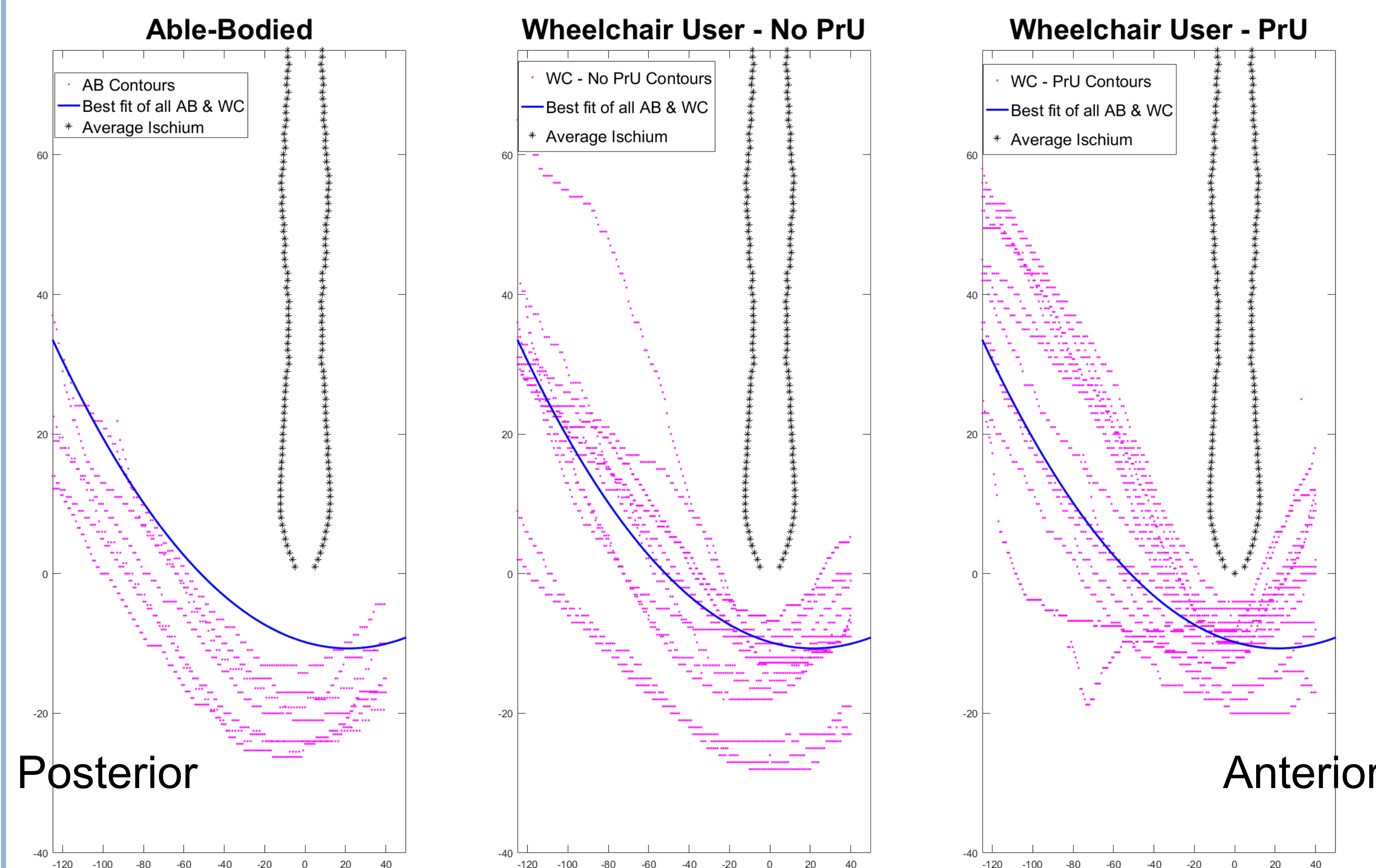


- Human testing in the seated MRI. 3rd order polynomial fit to coronal skin contours
- Ride Java (n=15), J2 Deep Contour (n=9), Jay Fusion (n=3), Jay Active (n=1), Matrx Vi (n=13), Roho HP (n=15)



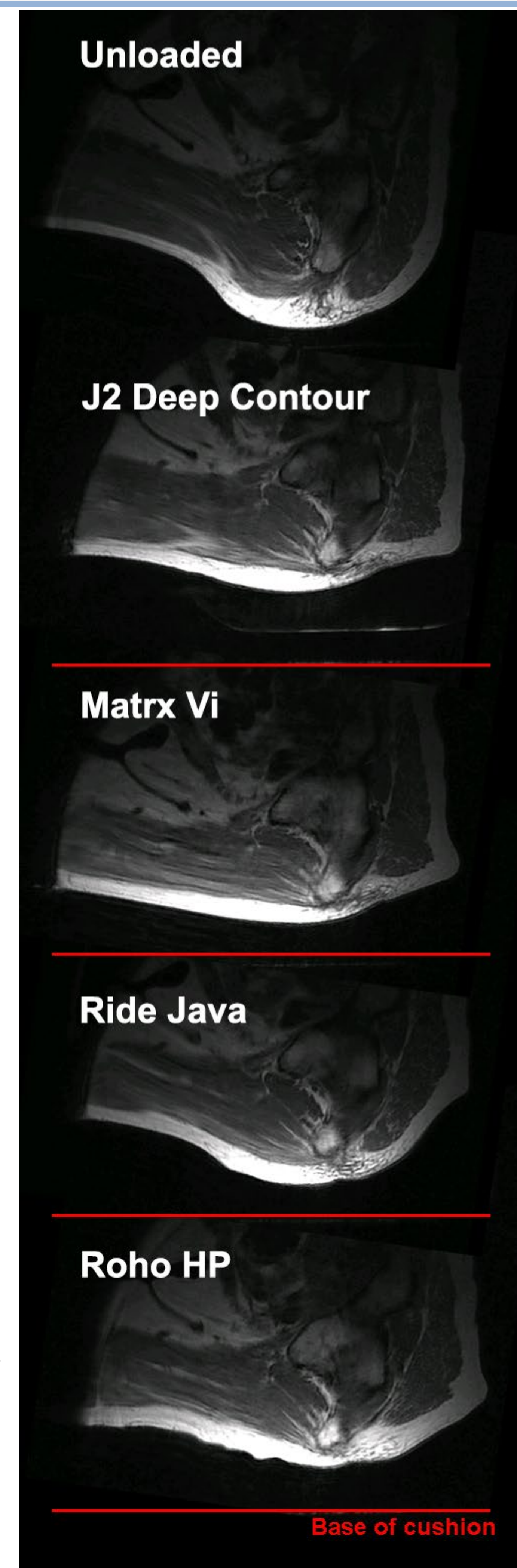
Buttocks Shape According to Pressure Ulcer (PrU) Risk Status

3rd order polynomials were fit to all sagittal buttocks contours when seated on flat HR45 foam (including able-bodied and wheelchair users) and is presented in the blue line below. Pink lines show individual subjects in each risk status group, with MRIs of one example participant from each category demonstrated below. Buttocks contours differ considerably according to risk status.



One person, many cushions

- 53 yo M with Spina Bifida
- 8 years in WC
- 5'11", 205 lb
- No Hx of PrU
- Sagittal views on 4 different wheelchair cushions
- Shear strain of adipose just posterior to ischium most evident on J2 Deep Contour and Matrx Vi
- Tissue thickness under the ischium is similar on all cushions
- Gluteus maximus is posterior and superior to peak of ischial tuberosity on all cushions



Discussion

Tissue contours in the loaded buttocks present an interesting way to investigate cushion shape compliance and to compare biomechanical risk of individuals.

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