

Title: Mechanism of fluctuation in shear force applied to buttocks during reclining of back support on wheelchair

Authors: Kenichi KOBARA, RPT, PhD^{1)*}, Daisuke FUJITA, RPT, MA¹⁾, Hiroshi OSAKA, RPT, MS^{1,2)},

Tomotaka ITO, RPT, MS^{1,2)}, Yousuke YOSHIMURA, RPT, PhD¹⁾, Hiroshi ISHIDA, RPT, PhD¹⁾,

Susumu WATANABE, RPT, PhD¹⁾

1) Department of Rehabilitation, Faculty of Health Science and Technology, Kawasaki University of Medical

Welfare, 288 Matsushima, Kurashiki, Okayama 701-0193, Japan

2) Doctoral Program, Graduate School of Health Sciences, Hiroshima University, 2-3 Kasumi 1-chome, Minami-ku,

Hiroshima 734-8551, Japan

* **Correspondence to:** K. Kobara

Tel: +81 86462 1111. **Fax:** +81 86464 1109. **E-mail:** rptkob@mw.kawasaki-m.ac.jp

Running title: Mechanism of fluctuation in shear force

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Abstract

Purpose: The purpose of this study was to investigate the mechanism of the fluctuation in the shear force applied to the buttocks.

Method: The subjects were 11 healthy adult men without leg or trunk diseases. The amount of force applied to the buttocks was measured by using a force plate, and a pressure and shear force sensor was used to measure the timing of the force applied to the back support.

Results: The average value of the shear force applied to the buttocks was 9.4 SD 2.4 [%BW] in the initial upright position (IUP), 9.3 SD 1.2 [%BW] in the fully reclined position (FRP), and 15.0 SD 2.9 [%BW] in the returning to an upright position (RUP). Significant differences appeared between the RUP and the other positions.

Conclusions: The results of this study suggested that the adjustment of the axes of rotation of the back support and trunk–pelvis and the release of the remaining shear force after the back support is reclined are important for the prevention of decubitus ulcers.