

## **DEVICE TO MEASURE THE DIMENSIONS OF THE HAND AND FINGERS FOR PRESSURE THERAPY GLOVES FOR BURNS PATIENTS (P167)**

Gibeault J.-P.<sup>1</sup>, \*Horn T.<sup>1</sup>

<sup>1</sup>OrtoPed Inc., Saint Laurent, Canada

The accuracy of hand anthropometric data for the fabrication of pressure therapy gloves is critical to the healing process. This study proposes a new device using high speed photogrammetric technologies combined with identification and calculations algorithms. The measurements obtained with the device are evaluated through comparisons with manual measurements. In this study, typical circumferences and lengths of the hands of a representative population of individuals are measured a) manually by an experienced burns technician and by a non-experienced research engineer using a measuring tape and b) by the analysis of images obtained with the device for each hand. A quantity of three manual measurements with a tape were taken from each hand by each measurer and the same number of measurements were generated with three different captures of data with the device. A comparison of the variability in measurements between the manual methods and the measurements generated from images taken with our device was done using statistical methods. A maximum RMSE of 6mm compared to manual measurements and a repeatability of measurements within 1mm for linear measurements and 6mm for circumferences were obtained within the context of the initial development. The authors decided to not use the currently available 3D technologies as they are expensive and they require more time to obtain the required measurements. This proposed technique experienced limitations primarily with hands that cannot lay flat with open fingers. Research is ongoing to address these limitations and to develop other hand related applications. The hand dimensions obtained with the proposed technique are well correlated with manual measurements. This device provides the burns specialists with an easy to use, accurate and a fast technique to capture the anatomical dimensions of the hand and digits to provide the required measurements to design and fabricate pressure therapy gloves.