



Development of medical device design method considering human-centered design

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Abstract

According to the Ministry of Health, Labour and Welfare, accidents due to medical malpractice have occurred in Japan through the mishandling of medical devices. Emphasis is placed on the function and cost of medical instruments in the design stage, without considering their usability. Therefore, considering human-centered design (HCD) is required. The main goal of HCD is to improve the ease of product use in order to maximize user satisfaction and enhance the safety of the device. Usability depends on the shape of the device, and thus the analysis should be carried out using the feature quantity of the shape. This study focuses on the method which digitizes the change of the shape by extracting the shape information, in addition to the derivation of the design plan using the engineering design variable. In HCD, divergence and convergence of ideas is important. The design plan was derived using the generative design for the divergence of the idea. Through this, many design plans were derived on the basis of one plan. We quantified the matching distance using image processing. Lastly, we derived of the design plan and the analyzed the data on device shape through digitization.

Keywords: Human centered design, Design method, Medical device