

Thesis Project Portfolio

Design of an Elbow Joint Reduction Trainer for Dislocation Management

(Technical Report)

The Effect of Technology on Disparities between Rural and Urban Healthcare

(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

The technical capstone research addresses the lack of proper joint reduction training in orthopedic care. The first time a clinician performs a joint reduction is typically on a patient, which can lead to hesitancy or error in the technique, potentially causing severe complications. To address this need for timely, technically accurate joint reductions, an elbow joint reduction trainer was developed to teach medical personnel proper recognition of a dislocation and the procedure necessary to reduce the joint. Access to training resources such as the elbow joint reduction trainer is important in providing quality healthcare to patients. A common barrier to this is a lack of funding to afford these essential resources, which can commonly be seen in rural hospitals. The accessibility of the elbow joint reduction trainer, and other resources like it, will have an impact on the disparity between rural and urban healthcare. Medical technology can be analyzed to consider whether it impacts the disparity between rural and urban healthcare through Langdon Winner's science, technology, and society (STS) framework of political artifacts. The STS research paper explores how technology impacts the quality and accessibility of patient care, and the affordability of this resource will dictate whether it contributes to or eases the disparity between rural and urban healthcare. This research was conducted by collecting data from expert interviews with patient advocacy group leaders, and ultimately found that medical technology does impact the disparity between rural and urban healthcare. Inequitable access to medical technology increases the disparity, while certain new uses of technology work to decrease the disparity. When considered in concert with these findings, the elbow joint reduction trainer does have an impact on the disparity, depending on its accessibility. It is imperative that this technology, like all medical technology, is made accessible to rural and urban medical centers alike, so as to decrease the disparity between rural and urban healthcare.