
785 **Assessing The Kinematics Of Virtual Reality Gaming As Physical Therapy In Burn Patients**

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Introduction: Virtual reality (VR) gaming offers an immersive experience that can enrich physical therapy for the burn patient by introducing variability, enjoyment, and reward during functional motions of the upper extremities. In this study, we aim to support a proof-of-concept for VR gaming in upper extremity burn rehabilitation by characterizing shoulder and elbow kinematics during VR gaming in a healthy volunteer.

Methods: A healthy volunteer without burn injuries played two games, a virtual rhythmic baton and virtual boxing game, on a commercially available VR gaming platform. Kinematics during play were assessed using two external cameras placed orthogonally, to the player's front and left, so that 3-dimensional motion of the player's left arm could be captured. Video of each gaming session was processed using an open-source perceptual computing software that dynamically tracks the user's upper extremity during play. Kinematics at the left shoulder and elbow were characterized with respect to range of motion (ROM) and time spent in composite positions.

Results: During the rhythmic baton game, the player achieved 157 degrees of elbow flexion ROM and 90 degrees shoulder elevation ROM. During the boxing game, the player achieved 156 degrees of elbow flexion ROM and 123 degrees shoulder elevation ROM. The baton game was associated with more time spent in the "rest" position (elbow extended with shoulder adducted, 60% of the game) while boxing was associated with more time in the "Guard" position (elbow flexed with shoulder elevated, 79% of the game) (Figure 1). Both games demonstrated simultaneous movement at both the shoulder and elbow during play.

Conclusions: The two VR games investigated in this kinematic assessment challenged players to achieve a wide range of motion at the upper extremity with functional, multi-joint movements. These findings support a potential role for commercial VR gaming in burn rehabilitation and future research in burn patients is required to demonstrate its therapeutic value.

786 **Electrical Injury Resulting In Bilateral Upper Extremity Amputation: Improving Independence And Quality Of Life**

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Introduction: Fifty seven year old male who sustained an electrical burn injury that resulted in bilateral below elbow amputation began inpatient rehabilitation program. Patient was motivated to increase independence to return home prior to prosthetic fitting and training being completed. Quality options for adaptive equipment required to increase independence were not sufficient to meet patients needs, thus innovative specialty fabrication of adaptive equipment were required to meet patient's goals of independence.

Methods: Occupational therapist to use thermoplastic material to fabricate various adaptive equipment in order to address patient's goals to increase independence with self care tasks. Occupational therapist and patient to have one time consult with hospital maintenance employee to create pant hook to use for ease of donning/doffing over hips. Patient participated in daily Occupational therapy sessions focused on trialing adaptive equipment and to provide feedback for any desired changes of equipment to maximize patient progress and success with reaching independence with self cares and return to life roles.

Results: Patient met all goals to become independent with self care tasks including: toileting, dressing and showering as a result of using fabricated adaptive equipment and techniques addressed during therapy sessions. Patient able to return home independently following discharge from inpatient rehabilitation stay.

Conclusions: Use of easily accessible ezeform thermoplastic material can result in fabrication of adaptive equipment to increase patient's independence. It is important to maintain a creative outlook as a clinician and to continue to collaborate with our patient's to identify barriers to success and explore options to increase patient's desired independence.