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Developing a Virtual Reality Game for Vestibular Hypofunction

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Vestibular hypofunction occurs when there is an impairment to the vestibular system. The purpose of this project is to develop a virtual reality experience using the HTC Vive that incorporates gaze stability exercises. A start-up menu with three levels of the game was created with each level having increased difficulty. The patient progresses through levels by increasing the number of repetitions and speed of head movements in addition to changing position from sitting, to standing, to Romberg, and finally tandem stance. The patient selects their level of dizziness and the game determines whether they should stop, continue at the same level, or move to the next. The game also provides audio and visual feedback to the user, including sound when they rotate their head through the required horizontal angle and warning them if they move their head vertically from the optimal range. The game saves the patient's results so that their compliance and progression in the game is recorded. The next step is to develop a survey to give to patients who have vestibular hypofunction to determine their acceptance of the virtual reality system and to modify it based on their feedback. In order to improve symptoms resulting from vestibular hypofunction, patients need to perform gaze stability exercises several times a day. By using virtual reality, patients can have an interactive game that they play to make their exercises more exciting.

Biography

Dr. Gras and Dr. Fishel are professors in the Department of Physical Therapy at Ithaca College where they teach neurorehabilitation. Dr. Gras has been a faculty member for 18 years and a physical therapist for 27 years. Her research is in fall prevention in older adults. Dr. Fishel has been a faculty member for 3 years and previously working in a rehabilitation setting. Her research is in the area of rehabilitation interventions for individuals with neurologic injury. Kat Crowe is a doctorate of physical therapy student in her final year of the educational program at Ithaca College.

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