



Service Priorities and Programmes Electronic Presentations

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Submitting author: Ms Chui Ming LAM

Post title: Occupational Therapist I, Tuen Mun Hospital, NTWC

Application of Advanced Technology in upper extremity training program of Rehabilitation Stroke Unit in Tuen Mun Hospital

Lam CM, Cheung TY

Occupational Therapy Department

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Introduction

Upper limb impairment is one of the most important challenges for clinicians and stroke survivors (Nick, Kate and Fran, 2015). Nowadays, Advanced Technology in stroke rehabilitation appear to give modest additional benefit when compared with usual practice or in addition to usual practice (Sybil, Venugopal, Ian and Anand, 2014). In fact, there has been a large evolution in rehabilitation technology in the last decade that has created a vast spectrum of new opportunities for clients and therapists (Timmermans, Seelen, Willmann and Kinqma, 2009).

Objectives

To incorporate the advanced technology into Stroke Upper Extremity Training Program of Rehabilitation Stroke Unit in Tuen Mun Hospital.

Methodology

Barecca et al. (2001) noted that rehabilitation of the hemiplegic upper limb remains difficult to achieve, with only 5% of stroke survivors who have complete paralysis regaining functional use of their impaired arm and hand (Dombovy 1993; Gowland 1982; Kwakkel et al. 2000). When a stroke client was transferred to Rehabilitation Stroke Unit in occupational therapy department of Tuen Mun Hospital, they will receive an intensive upper extremity training program. In our training program, we adopt Hong Kong Version of the Functional Test for the Hemiplegic Upper Extremity (FTHUE-HK) as assessment tool, in which impairment of upper extremity can be classified from level 1 to level 7. In our stroke training program, Robotic training technology would be applied when clients are suffering from level 2 to level 4. The use of robotic program can facilitate highly specific training task and may also allow a sufficient number of repetitions in a motivating environment. For those clients achieve higher level (level 5 to level 7) in FTHUE, computerized task oriented training on various grip and pinch prehension pattern will be incorporated into training program. Besides, wii games will be also included for dynamic performance in ADL task. In addition to the active training component, we start to apply sEMG in stroke rehabilitation program since 2015. For those client with muscle activation and had

motor intention to drive the robot to perform programmed tasks.

Result

Results: FTHUE-HK as upper extremity assessment tool for stroke clients, client with different impairment of upper extremity can receive both conventional therapy in addition to different advanced technology treatment modalities. By using computerized interface training and robotic training, which can allow clients to perform early, intensive, and task-oriented activities. Client can easily visualize their own improvement in their hemiplegic upper extremity by using upgrading level system.

Conclusion: Overall, the application of advanced technology is to facilitate learning and practicing new motor skills which is important in neuroplastic change and functional recovery to the nervous system. Reorganisation in a functional meaningful way is dependent on motor activity as executed during rehabilitation, and its followed by functional improvements (Schenk, Colombo and Maier, 2013). To incorporate the advanced technology can lead to increase clients' participation in training and finally enhance their ability to live independently.