De Hoogstraat Revalidatie

UMC Utrecht

Center of Excellence for Rehabilitation Medicine Utrecht

Making of a Mixed Reality patient education intervention for patients with spinal cord injury

JF Baardman, MD[1], J Janssen, PT MSc[1,2], JJ Collet[3], K Wit, BSc[3], SA van Langeveld, PT PhD[1], JM Stolwijk-Swüste, MD PhD[1]

[1]Rehabilitation Centre De Hoogstraat, Utrecht, the Netherlands. [2]Holomoves, Utrecht, the Netherlands. [3]Patient expert

Introduction

The human body is complex to understand, imagine the challenge for patients with spinal cord injury to understand the consequences of the injury to their bodies. Effective counselling is essential for long-term health. Conventional education methods, however, have barriers [1]. Interactive patient education interventions using Mixed Reality (MR) strengthen knowledge transfers with three-dimensional human-like visuals (holograms) and can be used at a convenient time for the patient and its caregiver.

Methods

Authors created the first MR patient education app explaining the basic consequences of a spinal cord injury, focusing on locomotion, sensation, organ function and autonomic changes. In this process, patients, rehabilitation therapists and physicians were involved to determine the requirements of effective MR patient education. An iterative development process in cooperation with an MR software developer followed.

Results and discussion

10 patients and 8 rehabilitation professionals were interviewed to determine requirements about the content, visual aspects and usability of the app. An interactive hologram to visualize the injury and its primary consequences was created in MR and supported by textual and auditory explanations. The first experiences of patients in a pilot study are promising. Furthermore, there is potential for expansion (for example adding detailed modules about consequences for neurogenic bladder problems).

Must-have requirements	
Content	Tailored information for subacute rehabilitation phase
	Etiology
	Completeness of injury
	Tailored to individual lesion level
Visuals	3D model
	Nerves and muscles
Usability/ controls	Usable in wheelchair and in bed
	Gaze and voice command
	Easy interface
	Usable with upper limb orthoses and/or wheelchair gloves
	Pause button
Other	Dutch language

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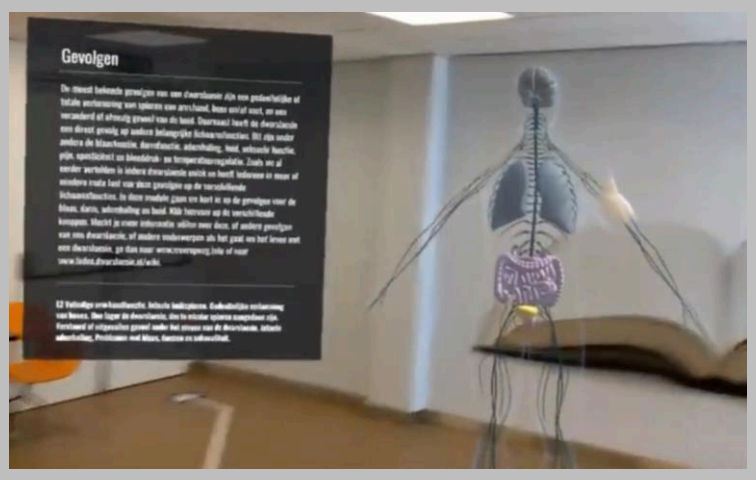

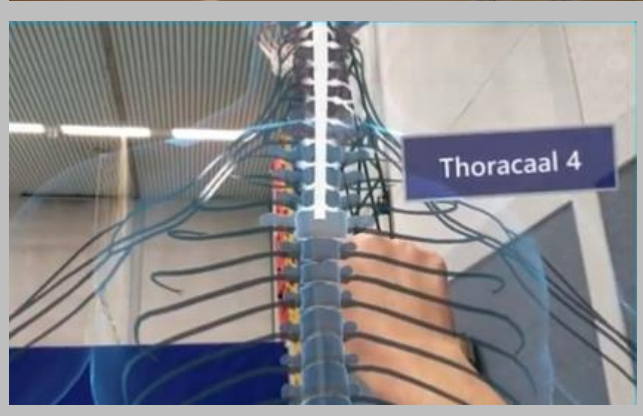

Demo?

Conclusions

Patients and professionals believe that interactive, visually supported patient education interventions using MR are beneficial in the knowledge transfer in the subacute inpatient rehabilitation period after spinal cord injuries. MR can offer this. The next step is to evaluate it in daily practice and to expand it.

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[1] van Wyk K et al. (2015). Top Spinal Cord Inj Rehabil, 21(1):49-60.

Email: j.baardman@dehoogstraat.nl