Title: Patient Refractive Needs Assessed with Objective Measurements

Category: Cataract

Topic: Cataract procedure

Subtopic: Other

Purpose: To investigate patient refractive requirements based on automatic continuous measurements performed with a wearable monitoring device worn during regular patient's visual activities.

Methods: Patients were offered to perform testing of a system produced by Vivior AG, Zurich. The system consists of a wearable monitoring device wirelessly connected to provided smartphone.. Wearable device is attached to the spectacles frame and automatically performs continuous measurements with multiple sensors, including viewing distance, ambient light and motion. Sensor data is processed to deduce and characterise patient's visual activities, such as reading, computer work, outdoor exercise, etc. and associated distances. Additionally, patient has an option to self-report activities using smartphone application. Results of the analysis are presented graphically and are used as a basis for review and discussion of patient's visual requirements, expectations after cataract surgery and impact on their activities.

Results: Testing demonstrated high patient compliance with the measurement protocol. Typically patients collected more than 18 hours in total during multiple days. Continuous measurements sessions often extend over 10 hours. High percentage of patients made use of the smartphone interface to regularly record their activities and relevant information. Patients generally found data visualisation helpful for understanding their visual needs and for better matching their expectations with available refractive solutions. In several occasions minor usability issues like difficulties in attaching device to the frame have been recorded.

Conclusions: High patient's acceptance and consistent data quality from non-supervised measurements performed by the patients demonstrates feasibility of wearable outpatient monitoring system for investigation of patient's visual behaviour. Feedback collected from patients and medical staff is going to be used for the further improvement of the measurement system and protocol.

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