

Interview-based questionnaire on HAL robot-assisted voluntary initiation of joint movement

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Abstract

This questionnaire serves to interview subjects undergoing rehabilitation of joint movement by means of exoskeleton robot HAL (hybrind assistive limbs). The goal is to learn about subjective control strategies during voluntary initiation of joint movement. Questions and multiple-choice answers build on phenomenological introspection. The results of the questionnaire are correlated to a gait score analysis.

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Guidelines

The questionnaire might cause mental burden for the subjects because they might recall their experience of not being able to move. This could raise traumatic experiences and result in severe mental stress. This risk has to be minimized by carefully selecting subjects that are mentally and emotionally stable enough to face their experience of impairment. Therefore, the selection of subjects will be done based on the judgment of a medical doctor.

Furthermore, the workload of the study is minimized by conducting the questionnaire within one hour (including the preparation). In case that the subjects do not feel well or need to lay down due to their physical conditions, subjects have the possibility to take a rest any time during the interview. During the interview, the interviewer has to carefully observe the subject and stop the questionnaire in case of any signs of stress on the side of the subject. Medical staff has to be available.

In order to decrease the subjects' overall burden, the interview is to be conducted just after finishing the last HAL session.

In order to avoid any burden on the subject's locomotor system, subjects should keep sitting on a seat during answering the questionnaire so that they do not need to move or engage in any physical exercise.

Protocol

Preparing the interview session

Step 1.

A medical doctor selects a subject that has sufficient cognitive capabilities to participate in the interview.

Preparing the interview session

Step 2.

The subject enters the room of the interview and takes place on a seat in front of at a table.

Preparing the interview session

Step 3.

A medical doctor explains the purpose, method, expected contribution, and privacy protection issues regarding the questionnaire and obtains written informed consent.

Spouses give written informed consent for those subjects that might not understand the explanation sufficiently due to their medical condition.

Conducting the interview

Step 4.

The interviewer asks the subject whether he or she wants to read the questionnaire sheet and fill in the answers by him- or herself. In this case, the experimenter stays still beside the patient and, in case of any question, supports the subject's understanding of the questionnaire.

Otherwise, the experimenter verbally reads out each of the sentences of the questionnaire and fills in the answers based on the subject's verbal response.

Handling data

Step 5.

The data obtained through the interview is added to the interview evaluation data sheet.

Statistical data of the subject is added: gender (male/female), age, diagnosis, time of diagnosis, time of beginning HAL rehabilitation, interview date, period of participation in rehabilitation (weeks), frequency of rehabilitation (1 hour per week x times), total number of rehabilitation sessions.

Gait scores (so far available) are added: mRS, BI, FIM-M, FIM-C, 10m or 6m WT.