

ASSESSMENT OF ARM FUNCTION

Occupational therapy is a paramedical service that treats children as well as adults who are limited in their daily activities by a physical or mental illness. The aim of an occupational therapist is to teach people towards optimal performance in their daily activities, such as washing, cooking, playing, etc. Observation of the performance in these behavioral activities is an essential component of the professional assessment. It was questioned whether the use of The Observer could assist this process in the observation of children who are suffering from a so-called Obstetric Plexus Brachialis Lesion (OPBL). The plexus brachialis is a “nerve network” from the spine (neck) to the arm and is responsible for good motor control of arm function. The lesion occurs when, for example, a baby is born in breech presentation, resulting in traumatic stress on the nerves during delivery. The result is a partially paralyzed arm. Apart from occasional nerve reconstruction surgery, these children are treated by occupational therapists. They gather information about arm and hand skills with the EPEK test, a method for observing standardized daily activities for children 4-6 years of age [1]. The therapist observes and assesses the child’s (in)ability to perform the task and especially how the task is performed. This information is used in a report to the treatment team (physiotherapist, orthopedic surgeon) who decide on the optimal therapy, including possible surgery to the muscles. In this study The Observer was used to automate the observational assessment and reporting process of the abilities of arm functions of children using the EPEK test.

USING THE OBSERVER FOR ASSESSMENT OF ARM FUNCTION

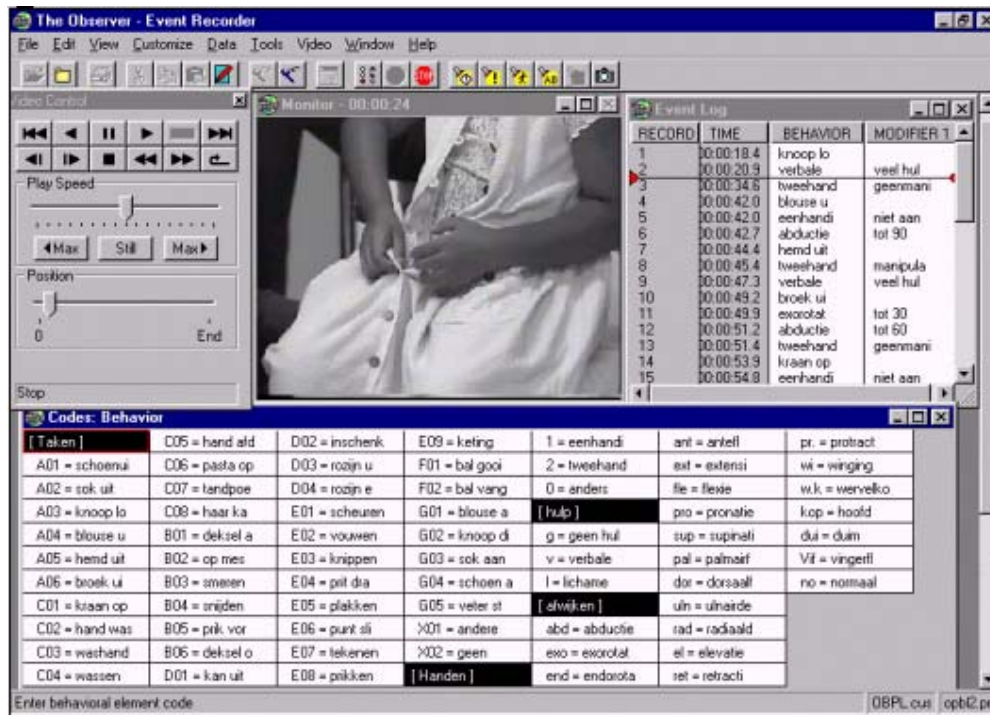
We used The Observer Basic (version 3.0) to transform the EPEK test into a computerized coding scheme. The codes are grouped in four behavioral classes: Tasks (eating, washing, etc.), Hands (which hand performs the task?), Help (manual, verbal, how much help, etc.) and Deviation (deviations in posture during the task). Each class has codes for behavioral elements and modifiers. With the use of these codes the observational data of the child were collected by the occupational therapist with The Observer Video-Pro (version 4.0). The observational data is used to make a report, based on a Time-Event Table. This is exported to Excel to give a good overview of the data, with excerpts of movie and comments written behind the specific data (see table). This Excel document can be e-mailed to the rest of the team or presented on an intranet site.

Data	
Task	Making sandwich
Hands	Two hands (workhand=non affected)
Help	Verbal help
Deviation	>90° abduction
Comment	The supportive hand has more than 90° abduction.
Movie	An excerpt of the child preparing a sandwich (selected part from the digital recording)

GAIT ANALYSIS

The department of rehabilitation medicine treats patients who are physically limited in their daily activities, for instance after a car accident or stroke. One of the aims is to improve the mobility by specific treatment, based on proper assessments of gait function. Gait analyses are very important in the process of identifying the problem. Specialists in rehabilitation medicine use rating scales to report the observational gait analysis, such as the Edinburgh GAIT scale [2]. The Edinburgh GAIT (= Gait Analysis Interval Testing) scale assigns a value to every

deviation of the patient's walking pattern per anatomic part, per phase. A phase is, for instance, first foot contact, with e.g. joint functions of ankle, knee and hip. Each deviation is given a score (0=normal, 1=marked, 2=deviation). Such a testing scale gives the doctor a standard overview of the deviations demonstrated during walking. Besides this profile, every deviation has a score, and the total score gives an overall rating of the patient's gait. In our study, the Edinburgh GAIT scale was used in The Observer for the observation of children with cerebral palsy. The Observer was used to automate the observation and to validate the Edinburgh GAIT scale.



Automation of the EPEK-test using The Observer Video-Pro

USING THE OBSERVER FOR GAIT ANALYSIS

The codes for the Observer were grouped into six classes: Foot, Knee, Hip, Pelvis, Trunk, Score. Within each main group, we scored the deviation with respect to phase and anatomic part (behavioral elements) and the size of the deviation (modifiers). The class 'Score' gives a value (0, 1, 2) to the deviations. The data were transported from a Time-Event Table to Excel where the class Score can be summated to generate a profile of the patient. A report can be made in the same way as the example of the arm function assessment by occupational therapists. These data can also be used by researchers to validate the GAIT scale.

CONCLUSION

The use of The Observer in a clinical environment has great potential. It overcomes some of the disadvantages of the conventional method (working with a VCR, pen and paper) such as:

- User comfort, all observation instruments are in one frame.
- The data can be exported to other programs, such as Excel and SPSS.
- The data can be e-mailed or shared on a network.

However, because The Observer was originally designed as an instrument for behavioral research, we encountered some limitations. The Observer Basic 3.0 limits the length of codes to 8 characters, which is not always enough to code complex medical terminology. Summating the scores in a report was not possible within The Observer, which was overcome by exporting the time-event table to Excel. Furthermore, video editing to create movie excerpts was too cumbersome for smooth operation in a clinical context. In general, it was concluded that The Observer is principally well suited to assist observational analysis in clinical practice, but needs some user-oriented changes to become well accepted.

REFERENCES

1. Severijnen, S.; Tinselboer, B. (1998). *EPEK (Cerebral Palsy Evaluation Children skills)*. Unpublished thesis. Amsterdam: Academic Hospital Vrije Universiteit.
2. Anderson Gait Analysis Laboratory.

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