

The GraTaSim Quality of Life Recorder

A convenient system for computer-based measurement of Quality of Life

An electronic questionnaire - a tool for everyday clinical use?

In many clinical trials, questionnaires are used to collect data from patients.

On a request from the Cancer Centre of the University of Ulm to develop a computer-based system for quality of life assessment in 1993, we developed a solution based on the GraTaSim system that had been designed from 1989 on. With the resulting Quality of Life Recorder, a questionnaire can be presented to patients who answer all questions themselves by slightly pressing an electronic stylus on answering-fields located next to the questions.

During development, the following points received our special attention:

- **extremely simple handling**
- **use of standard hardware**
- **use of validated and/or site specific questionnaires**

The system has been used for about 20.000 measurements at several centres until now. We were surprised to find that not even elder patients do have any difficulties, but even may enjoy it instead. Only if the software complains about missing answers to questions accidentally left out, they realize that they are using a computer. Required data acquisition personnel is minimal.

In a feasibility study at the University of Ulm, 1157 out-patients used the system during a 4 weeks period of time in 1994. We reached a patients' compliance rate of 98.9%. The completeness of the EORTC QLQ C 30 (+3) questionnaire data is >99.95% (No answer was forgotten, but ~0.05%: "I can't answer this question."). The resulting data are representative for 94.8% (worst case) of the target population.

The required computer system

To operate the GraTaSim system as a Quality of Life Recorder, only an IBM-AT-compatible with floppy-disk-drive is required. A printer can be connected to print out a test result immediately after completion of the questionnaire. If a notebook PC is used, the system becomes portable and independent of the mains power supply.

The electronic questionnaire consists of a digitizer with electronic stylus, graphically designed tablet-template, the GraTaSim software (which simulates keyboard entry that has been linked to the answer-fields) and a program for data-acquisition.

Adopted questionnaires - standardized data format

Until now, GraTaSim has been used with the questionnaires SF-36, EORTC QLQ C-30 and C-30 (+3). Available in several languages, these are validated tools for measurement of Quality of Life. Compared to conventional paper questionnaires, the electronic one just moves the process of getting the data into a computer to the earliest possible point in time: a patient's answers go directly to a data acquisition program which - in contrast to optical scanner systems - immediately checks for mistakes in data entry or missing answers, calculates test results, stores the data on a disk and - optionally - generates a printout. This frees the time and manpower that would otherwise be required for data entry, whereas a high data quality is ensured without additional checking procedures.

Immediately after completion of the questionnaire, data are available for further processing. They can be transferred to virtually any computer system. With the GraTaSim software, other questionnaires can be adopted to the electronic system as well. LASA scales are supported as well as questionnaires consisting of several pages. Virtually any MS-DOS program can be controlled via GraTaSim.

The standardized, expandible data format used provides a basis for easy documentation and international exchange of Quality of Life data. Using the electronic questionnaire, Quality of Life data acquisition becomes simple, economic and reliable.

Sources of further information...

If you are interested in learning more about the Quality of Life Recorder or the underlying concept of the GraTaSim system, or if you consider using it in any given project, please contact:

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