Measurements as-a-Service

Mobility is a key element of a healthy lifestyle. A slow walking speed and limited activity are markers of health-related risks and challenges. Monitoring of cardiac output and respiratory volume is for example closely linked to measuring mobility, both in controlled circumstances and in daily life. In order for researchers, developers and therapists to focus on patients and health issues, reliable technology and logistics for collecting measurements is needed.

mcroberts

INTRODUCTION

Welcome to McRoberts: the leading provider of Measurements-as-a-Service (MaaS). With over 30 years of experience in assessing mobility, McRoberts is a household name in studies and publications on digital endpoints. Numerous patients, doctors and researchers have benefited from its patient feedback reports and mobility analytics. Its MoveMonitor and MoveTest sensors and its data aggregation infrastructure are integrated in clinical trials, research and therapy. With its quality- and service-oriented approach, McRoberts is a trusted partner in data aggregation, analytics and logistics.

1. STANDARD SERVICES

A standard Measurements-as-a-Service package includes a maximum of five MoveMonitors. An offer can be requested on the website, per e-mail or per telephone with our sales team. For requests per mail or on the website, please provide the number of patients of test subjects, and when and where measurements are needed, and some background information on what they are used for. This enables our team to provide you with the optimal offer and service.
Standard Measurement-as-a-Service by McRoberts involves several digital components, manuals and a website with frequently asked questions and a self-service data aggregation and analytics centre. The digital infrastructure consists of three layers:

Sensors: the MoveMonitor hardware worn by test subjects that measures their movement;

Data aggregation platform: web-based import, administration and export of measurements;

Data analytics: web-based measurement analytics suite and reports.

Measurement data from MoveMonitors with a valid license is imported with the DynaPort Manager (DPM), which runs locally on your pc. The DynaPort Manager collects the data and sends it to the aggregation platform, where it is stored and organized per project, test subject and collection date in our central database. The McRoberts Analytics Suite (MAS) uses this data to produce basic analytic data and reports. Data Transfer Files (DTFs) contain analytic data including different types of movement and their derivatives.

The MoveMonitor comes with a standard MAS-module and corresponding report: Physical Activity. Licenses and consulting for additional MAS-modules are optional. The standard self-service DTF includes the corresponding data analytics and PDF-reports. Sensors are shipped to a single address in Europe, additional logistic services are optional. Our support desk is available per telephone and per e-mail to address technical issues and set up user accounts.

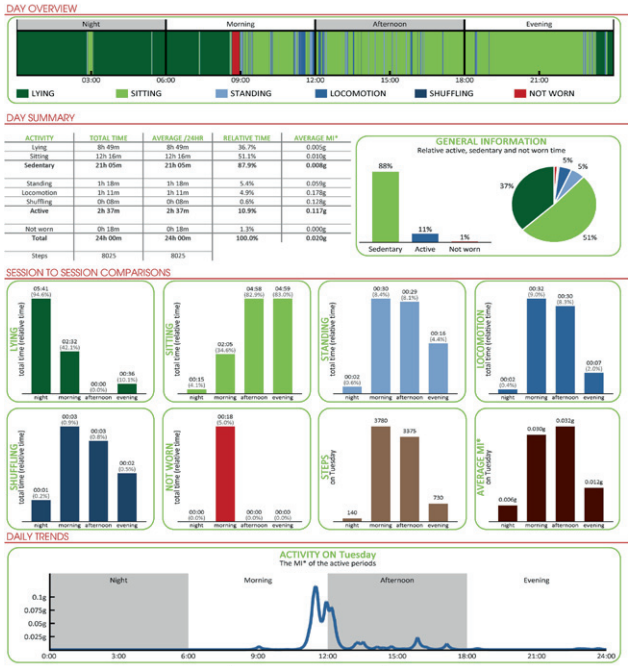
mcroberts

2. THE PHYSICAL ACTIVITY MODULE

Digital data is analysed and expressed in terms of body posture (lying down, sitting or standing), locomotion (walking and shuffling) and movement parameters (such as movement duration, intensity and frequency). The high resolution raw acceleration data lends itself to a pattern recognition approach that uses logical algorithms for the classification of types of activity. Lying can be identified from the orientations of the trunk. Sitting and standing can be identified by the pattern of transitions between activities. Locomotion is identified by intensity and frequency of cyclic movements.

The Physical Activity Module produces different types of PDF- and DTF-reports based on types of activity, for which absolute and relative durations are calculated. Numerical reports are event list with cumulative event number, start time, end time, and activity type. Summary reports include averages per type of activity over the complete measurement, and Day-to-day reports present day totals. The number of transitions between all types of activities are calculated and summarized in a table in Graphical reports.

For each period of walking that is detected, the amount of steps is determined and shown in Numerical and Summary reports. Movement frequency is the number of periods per activity type, which are presented in Summary and Day-to-Day reports. Finally, Movement Intensity (MI) is derived from the acceleration signal and gives an indication of the power of the movements. The MI per event is shown in Numerical format, and the MI per day per activity is shown in Day-to-Day reports. Various MI intervals are created. The number of periods in each interval is shown in the Physical Activity Recommendations report.



3. ADDITIONAL SERVICES

In addition to the standard services outlined above, additional services can be booked. This applies the MoveTest solution and to orders of six or more MoveMonitors, but also for projects which involve more complex logistics or project management. When additional analytics modules, non-standard data transfers or quality management support are needed, our sales consultants are happy to provide technical and functional support. Please contact our sales team through the website, per e-mail or by telephone to set up and plan mobility data services for trials, research and therapy.

3.1. Sensor Lease

A standard order involves one-off costs for devices which are owned by the client, and recurring license costs. McRoberts provides a leasing programme to repair or replace defect sensors after the hardware guarantee period, to update hard- and software when new releases are available, and to provide financing with a monthly fee. The lease programme includes logistic services, support and consulting for repairs, replacements and supplements.

mcroberts

3.2. Module Licenses

In addition to the Physical Activity module, trials or research projects may require licenses for further analytics and reporting. Activity-related energy expenditure (AEE) is quantified using the detected type of physical activity (PA) and movement intensity (MI), based on a tri-axial seismic accelerometer, with energy expenditure for PA as a reference. Adherence to physical activity guidelines as defined by the American College of Sports Medicine (ACSM) based on MoveMonitor measurements are provided by the ACSM-module. MoveMonitor measurements may also be used for advanced analytics in the Sleep-module.

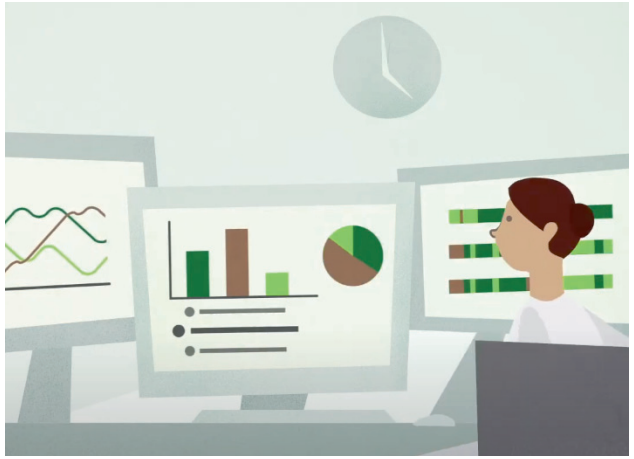
3.3. MoveTest

Mobility and balance impairments in older adults can be assessed using our MoveTest solution.We distinguish six separate modules:

1. 6-Minute Walk Test for assessment of aerobic capacity and endurance.
2. GaitTest for detailed assessment of human gait.
3. Sit To Stand Test for assessment of lower extremity power and functional capacity.
4. Timed Up and Go Test (TUG) for assessment of functional mobility.
5. Short Physical Performance Battery (SPPB) for assessment of lower extremity function and mobility in elderly.
6. SwayTest for detailed balance assessment.

3.4. Customized Data Management

Standard data exports of raw analytics and reports of all modules is included in the self-service Data Transfer Agreement that comes with McRoberts sensors. For trials and research purposed, additional data may be needed, for example signal and additional analytics data. Our data management team is happy to provide additional DTAs where needed. Please contact our sales team to determine what data is needed, when and where it should be delivered.



3.5. Advanced Logistics

Standard orders are shipped to one address in Europe. In some projects, devices are delivered to several locations, sometimes outside of Europe. This often involves additional trade or other documentation, and additional coordination. Our experienced services team can set up such additional logistics, so that the project team itself can focus on the trial or research project.

3.6. User Services

The standard mobility data service contract includes the McRoberts web-based self-service user and measurement data management suite. In some cases, additional technical consulting is needed. In complex project or other organisations, many different user roles exist or a back-office for the creation, modification and termination of user accounts is needed. In larger organisations, face-to-face or online training may be needed in addition to the manuals and FAQs available on the website. Our services team provides such user services when needed.

mcroberts

3.7. Consulting

Our sales team provides consulting on all additional data, logistics or user services and modules required for a project or organisation. In some cases, consulting is needed on measurements themselves: for example on setting up representative testing or on interpreting and process findings in the module reports. Our sales team includes experienced human movement scientists who are ready to help.

3.8. Project Management

Some larger projects and trials require additional support and project management services in addition to the data, logistics and user services outlined above. Members of the McRoberts services team regularly attend progress meetings, assist in intra-project logistics and provide reports – in movement measurement contexts of course. McRoberts has supported and participated in many projects, trials and Innovative Medicine Initiatives (IMIs), so our services team are familiar with the dynamics and characteristics of such projects and trials.

3.9. Quality Management

Many health-related projects and organisations operate within the context of Quality Management Systems environments. Rules and regulations and processes exist for data and user management, but movement measurement is also part of several operational and other processes and internal and external audits are common. McRoberts standard employs CE-certified sensors and ISO-normed processes. In addition, we offer audit, reports and quality consulting services.

mcroberts