Stroke is the third leading cause of death and is also a cause of serious long-term disability for its survivors. Over 80% of stroke patients suffer from unilateral sensor motor deficits (hemiparesis). Stroke patients have not reached their full potential when they are discharged from acute hospital[1]. Especially arm-hand function recovery lags behind, leading to disablement and poor quality of life[2]. However, after discharge there is a lack of availability for further treatment of stroke patients, leading to high levels of patient dissatisfaction[3]. There is no standard treatment for home rehabilitation. Outpatient physiotherapy rehabilitation is maximum 2-3 times per week over a mostly too short period of time. Guided home rehabilitation is proven to lead to further improvement[4] and gives important advantages. The patient can train much more often which will lead to better results and faster progress in motor learning[5]. In addition the patient can train in his/her well known home setting, which is important especially for elderly people. Paramedical staff will be supported and relieved from work load which will reduce governmental costs and health assurance for health services. Acceleration of recovery will provide higher quality of life for stroke patients[6]. **Methods** We conducted a pilot study (conform Good Clinical Practice) with n=15 subjects to investigate the feasibility of a sensor based home exercise program for the upper limb. Elderly stroke patients (first stroke) aged 55yrs and older with hemiparesis of upper limb (MRC 2-4) and fair cognitive level are enrolled in this study. Severe spasticity, aphasia and functional deficits of the upper limb other than from hemiparesis were excluded. Primary goal was to determine the usability and safety measured by adapted USE (Usefulness, Satisfaction, and Ease of use questionnaire) and CSUQ (Client Service Use Questionnaire). Secondary goals were the development of a usable human-machine interface that consider the special needs of elderly and the therapeutic value of the home training program for upper limb of geriatric stroke patients, measured with Fugl-Meyer Score, within 16 hours of additional exercise time. **Results** First unpublished results show a high acceptability within the study population measured by adapted USE- and CSUQ questionnaires. Against public opinion, elderly were highly motivated and eligible using the sensors and touch screen of the home stroke rehabilitation system. Our findings include also first promising results regarding the efficacy measured by Fugl-Meyer scores, whereas this point is secondarily objective of the study and will be observed in a randomized controlled trial. Currently our results clarify the safety and usability of the sensor based rehabilitation system in elderly people so that this system can be easily used in home environments without severe health risk.

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