

# Development of a mobile phone application for stimulation of personal mobility for COPD patients

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the recordings. **Results & Discussion** Peak sound levels are mostly caused by the slamming of doors (e.g. closets) and activities of residents and professional caregivers. Averaged over the five sleeping rooms the results show in the night period a mean A-weighted background noise level of 32.1 dB. The maximum A-weighted peak levels go up to 97.8 dB. During the day in the common rooms a mean A-weighted background noise level of 55.3 dB was measured with a maximum A-weighted peak levels up to 115.0 dB.

Table 1. Measurement results of five common rooms and five sleeping rooms; Aeq=A-weighted background noise level; Peak.max=Maximum peak sound level; Peak, 5min= 5min Mean sound level

Parameter (dB)	Common rooms		Sleeping rooms	
	Mean	Range	Mean	Range
L <sub>Aeq</sub> day	55,3	53,4–57,0	42,7	41,0–45,6
L <sub>Aeq</sub> night	32,2	29,6–33,7	32,1	28,5–36,5
L <sub>A,peak,max</sub> day	108,6	101,9–115,0	107,5	99,2–117,0
L <sub>A,peak,max</sub> night	92,1	83,9–105,4	89,0	83,7–97,8
L <sub>A,peak,5min,&gt;80,avg</sub> day	90,0	88,6–91,6	88,9	86,9–92,6
L <sub>A,peak,5min,&gt;80,avg</sub> night	86,1	83,5–89,2	85,2	83,2–87,7

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**Address:** Acoustics Laboratory, Eindhoven University of Technology, Eindhoven, Netherlands  
**E:** n.h.a.m.v.hout@tue.nl

S.N.W. VORRINK, H.S.M. KORT, T. TROOSTERS, J-W.J. LAMMERS. **Development of a mobile phone application for stimulation of personal mobility for COPD patients.** *Gerontechnology* 2014;13(2):87-88; doi:10.4017/gt.2014.13.02.208.00 **Purpose** Chronic Obstructive Pulmonary Disease (COPD) is a disabling airway disease with variable extrapulmonary effects that may contribute to disease severity in individual patients<sup>1</sup>. Patients with COPD show reduced levels of spontaneous daily physical activity (DPA) compared with healthy controls<sup>2</sup>. This results in a higher risk of hospital admission and shorter survival<sup>3</sup>. Pulmonary rehabilitation can help to



Figure 1: Three versions of the app, adjusted from left to right; the newest version is on the right

improve the DPA level, but the benefits obtained decline after 1-2 years<sup>4</sup>. **Purpose** In order to maintain DPA in COPD patients after rehabilitation, we developed a mobile phone application<sup>5</sup>. It measures DPA as steps per day, measured by the accelerometer of the smartphone, and shows the information to the patient via the display of the mobile phone. A physiotherapist can monitor the patient via a secure website, on which DPA measurements are visible for all patients. Here DPA goals can be adjusted and text messages sent. This presentation focuses on the development of the mobile phone application (app). **Method** A list of requirements for the app was created by the research group, keeping the main research purpose in mind. An algorithm was written that measures steps by looking at sinus movements. Preliminary testing was performed by carrying the smartphone with the app for 3 days in combination with a validated accelerometer (*Figure 1*, T=1). Subsequently adjustments were made and testing was repeated. Results have been discussed in an interactive workshop. Development of the app was iterative (SCRUM methodology<sup>6</sup>). Subsequently, three pilot studies were performed to test the mobile phone application for usability, user friendliness, and reliability, and were assessed with questionnaires. The application was tested with students and COPD patients, who wore the phone in their pocket. Pilot studies 1, 2, and 3 (*Figure 1*, T=1, T=2, and T=3, respectively) lasted for a week (n=10 students), 3 days (n=3), and 3 weeks (n=7), respectively. Feedback was collected in an interactive workshop. Subjects also wore a validated accelerometer (Sensewear) during the period of the study in order to compare these data with the DPA measurements of the mobile phone application. Mix methods have been employed for quantitative and qualitative data analysis in SPSS. **Results & Discussion** The findings from the interactive workshop indicated that the design for description of the data needed to be explored. It also provided insight in the feedback to be given in text to persuade users to be physically active and which type of widgets motivate users to increase their physical activity. The application was found to be useful and easy to learn.

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**Keywords:** housing & daily activities, health and self-esteem, COPD, physical activity

**Address:** Bolognalaan 101, 3584 CJ Utrecht, Netherlands; **E:** sigrid.vorrink@hu.nl

A. NEVEN, T. BELLEMANS, D. JANSSENS, G. WETS. **Application to support elderly while taking public transport services.** *Gerontechnology* 2014; 13(2):88-89; doi:10.4017/gt.2014.13.02.150.00

**Purpose** On-demand responsive transport (DRT) services are frequently offered in the context of door-to-door transportation of the elderly with their social participation as the ultimate goal. In Flanders, however, the supply of accessible transportation is fragmented. There are many different types of transportation provided, but many of these are especially expensive. Therefore, we aimed to support the elderly in using regular public transport (PT) services through coaching sessions and personalized monitoring during their trips. We also aimed to meet the specific transportation requests of elderly that cannot be met by using the regular PT network, in order to provide a wide inclusive mobility system in Flanders. **Method** In order to monitor elderly during their PT trips, the smartphone application 'Viamigo' was developed (in cooperation with Thomas More). This app allows the registration of newly learned PT routes by means of their GPS coordinates. The routes can be monitored from a distance by a coach (e.g. family member or care giver), who can receive a signal when the user gets too far from