

Project Progress Summary

Centralising the needs of people with stroke, chronic pain and chronic heart failure

We have used our previous consultations with people with stroke to construct two scenarios of how someone with stroke might use the personalised self management system (PSMS) within their homes. The scenarios are not based on any one individual but represent the combined experiences of people that we have spoken with. Project meetings were held to further develop the content of the scenarios, which were then used to develop very early “paper” prototypes of the feedback that a user might receive on a screen in their home and on a mobile device in response to different inputs or commands. The paper screen prototypes were then discussed in detail incorporating insights from different members of the multi-disciplinary team of researchers (clinical, HCI, computer and technology), leading to further modifications. This work is still work in progress with further user involvement, described below feeding into the prototype development.

Five people with stroke agreed to researchers visiting them in their own homes on three different occasions. The first visit entailed researchers finding out about the person’s engagement with the technology they have in their own homes through a technology biography. This explored participants’ thoughts and feelings toward current available technology, domestic technology, their first technology in their homes and their desire for future technology. Thematic analysis of participants’ accounts also revealed issues related to safety, security, trust, acceptability, and usability. It also demonstrated that the use of technology in people with stroke is closely related to their life goals and their coping strategies.

The second visit was concerned with how they cope with their disability on a day by day basis. The third visit involved leaving probe packs with the participants. The probe packs included.....

Analysis of data from the home visits and probe packs have been used to describe how self-management might be facilitated for a person who has experienced stroke and describe the requirements for an interface. Through the interface the person will be able to choose the life goals that they wish to work on in partnership with their therapist, receive instructions on prescribed exercises and receive feedback on physical activities and changes in physical activity and balance.

Two design workshops were convened over the summer to develop paper prototypes for stroke. The output from these workshops are being taken forward by Prof. Peter Wright and Dr. Silvia Torsi who are producing screen designs for the technologists at the University of Ulster to use for prototype development. This work also feeds into the overarching project Concept and Philosophy document.

The same pattern of user engagement, data collection and analysis has been replicated for people with the other two conditions being considered within this project, chronic heart failure and chronic pain. Data analysis has revealed some common themes, with a consolidation for report for all three conditions being produced. The scenario documents provide some preliminary conceptions of user interaction and feedback.

In addition to this work which spans the three conditions, a second focus group demonstrating prototype 1.5 (the mobile device) was conducted with participants with chronic pain recruited from Bath & North East Somerset (BANES) PCT.

We are now planning user testing of prototype 2. The interrelationships between measured variables (both behavioral and self-report) and feedback presentation require further development.

Dissemination APRIL – AUGUST 09

OUTPUTS To date the following outputs have been produced:

Biddiss E, Brownsell S & Hawley M. "Prediction of health status in individuals With congestive heart failure using a home-based telecare system." *Journal of Telemedicine and Telecare* 2009; 15: 226--31.

Brownsell S, Biddiss E & Hawley M. "Delivering ICT enabled health care to people at home: comparison between England and Canada." *Geriatrics & Aging* (in press)

Brownsell S, Aldred H, Blackburn S, Cardinaux F, Bradley D & Hawley MS. (2008). Towards optimising remote home support for Long Term Conditions. *Telemedicine and e-health*. 14 (S1):101 (American Telemedicine Association. Seattle, USA, 6-8th April 2008. Poster).

Brownsell S (2008). Telehealth promises major benefits for Long Term Conditions: but is the time right to embrace it?" *National Health Executive* (May/June): 41-43.

Burns WP, Nugent CD, McCullagh PJ, Zheng H, Finlay D, Davies RJ, Donnelly M, Black ND, "Personalisation and Configuration of assistive technologies", in Proc. of EMBC2008

Burns W, Nugent CD, McCullagh PJ, Zheng H, Black ND, Wright P, Mountain GA, "Home based Self-Management of Chronic Diseases", ICOST 2009

Burns W, Nugent CD, McCullagh PJ, Zheng H, Black ND, Wright P, Mountain GA, "Home based Self Management of Chronic Diseases,"

Huang Y, Zheng H, Nugent CD, McCullagh PJ, Black ND, Vowles K, McCracken L "Feature selection on Chronic Pain Self Report Data", submitted to ITAB2009

Huang Y, Zheng H, Nugent CD, McCullagh PJ, Black ND, Vowles K, McCracken L "Classification Of Health Level From Chronic Pain Self Reporting", IDIS eHealth 2009

Mountain G, Wilson S, Eccleston C, Mawson SJ, Hammerton J, Ware T, Zheng H, Davies R, Black N, Harris N & Stone T (2009) Developing and testing a telerehabilitation system for people following stroke: issues of useability. *Journal of Engineering Design*.

Rosser, B. A., Vowles, K., Keogh, E., Eccleston, C., & Mountain, G. A. (in press). Technologically assisted behaviour change: A systematic review of studies of Novel technologies for the management of chronic illness. *Journal of Telemedicine and Telecare*.

Rosser, B., Vowles, K., Keogh, E., Eccleston, C., & Mountain, GA. (2009). Technologically assisted behaviour change: A methodological review of studies designed to evaluate novel technologies for the management of chronic illness. British Pain Society Annual Conference, London, 31st March-3rd April. Rosser, B., Vowles, K., Keogh, E., Eccleston, C., & Mountain, GA. (to be presented).

Stroke scenario, stroke prototype 2, findings of home visits/technology biography to inform the development of the Stroke Prototype 2.

Technologically assisted behaviour change: A methodological review of studies designed to evaluate novel technologies for the management of chronic illness. 6th Congress of the European Federation of IASP Chapters (EFIC), Pain in Europe VI, Lisbon, Portugal, September 9-12.

Torsi has presented a short paper at the PETRA conference in Corfu in June:

Torsi, S., Nasrin, N., Wright, P.C., Mawson, S.J., Mountain, G.A. (2009). User-centered design for supporting the self-management of chronic illnesses: an interdisciplinary approach. [To be included in the Proceedings of the 2nd International Conference on Pervasive Technologies Related to Assistive Environments] PETRA'09 Jun 9-13, 2009, Corfu, Greece.

Wright presented a talk at Sussex University in June: Bringing user experience to design. Presented to the Interact Lab, University of Sussex. 12th June 2009

Yan Huang, Huiru Zheng, Chris Nugent, Paul McCullagh. 'A decision support system for chronic disease self management', poster presented at the BCS Health Care 2009 Harrogate, UK.

Zhang S, McCullagh PJ, Nugent CD and Zheng H, "A Theoretic Algorithm for Fall and Motionless Detection", Proceedings of 3rd International Conference on Pervasive Computing Technologies for Healthcare 2009, London, UK, Mar 31 - Apr 03, 2009

Zheng H, Nugent C D, McCullagh PJ, Burns WP, Alexander S, Huang Y, Zhang S, Black ND, Vowles KE, Mawson SJ, Eccleston C, Wright P and Mountain GA, "Integration of Assistive Technology to Support Self Management", Proceedings of the IET conference on Assisted Living 2009 (CD), London, UK, 24 - 25 March 2009

Zheng H, Nugent CD, McCullagh PJ, Burns WP, Black ND, Wright P, Mountain GA, Assistive Technology to Support Self Management of Chronic Disease, accepted by Telemed 09

Zheng H, Nugent CD, McCullagh PJ, Black ND, Eccleston C, Bradley D, Hawley M, Mawson SJ, Wright P, Mountain GA (April 2008), "Towards a Decision Support Personalised Self Management System for Chronic Conditions", in the *Proc. of IEEE International Conference on Networking, Sensing and Control*.

CONFERENCE POSTERS

Poster presented at the SRR summer meeting

Poster presented at the Summer School, Edinburgh

Poster presented at the VR conference, Haifa

Paper presented at the Petra conference, Greece