

# Canadian-UK collaboration

P. LANSLEY (Convener). *CIHR Canada-UK New Dynamics of Ageing Research Initiative. Gerontechnology 2010;9(2):126*; doi:10.4017/gt.2010.09.02.113.00

**Participants:** E. VAN DEN HEUVEL (UK), J. JUTAI (CANADA), A. ASTELL (UK), A. MIHAILIDIS (CANADA) and W. YOUNG (CANADA). **ISSUE** International research partnerships are increasingly indispensable in addressing complex health issues, particularly those related to ageing populations. In 2008, the Institute of Aging of the Canadian Institutes of Health Research (CIHR-IA) and the UK Research Councils' New Dynamics of Ageing (NDA) program established a joint initiative to promote collaborations among Canadian and UK researchers. This symposium features two successful bi-national, multi-disciplinary collaborations: (i) on assistive continence technology, and (ii) on monitoring and measurement of diet. **CONTENT** Presentation of early results from 'Tackling Ageing Continence through Theory, Tools and Technology' (TACT3) will include discussion of 'Smart underwear' testing and the limitations of current outcome measures. In association with TACT3, the adaptation and testing of a Psychosocial Impact of Assistive Devices Scale (PIADS) tool specific for continence technology will be described. Results of the 'Novel Assessment of Nutrition and Ageing (NANA)' project's development of nutritional assessment tools will be described in association with COACH, a previously proven intelligent home technology that offers automated prompts as it tracks the actions of an older adult. Consideration will also be given to a new collaboration: the 'Sustaining IT use by older people' (SUS-IT) program. **STRUCTURE** The context of the Canada-UK research collaboration will be briefly described by the convener, Prof. Peter Lansley. Eleanor van den Heuvel will describe assistive technologies developed for the core UK New Dynamics of Ageing (NDA) 'TACT3' project. Current methods of evaluating efficacy will be discussed, as will the linked Canadian project on the development and validation of measures of the impact of continence technologies on quality of life, which will be described by Jeff Jutai. Arlene Astell will provide an overview of the project that is embedded in her NDA-funded NANA program, the goal of which is to improve recognition of poor nutritional status in older people through improved identification and understanding of relevant factors. Collaborator Alex Mihailidis will describe the technological enhancement through advanced computer vision algorithms that can recognize different food types and calculate the portion size. Following the individual presentations, there will be an open discussion led by Professor Lansley. **CONCLUSION** Challenges associated with health and ageing require multi-disciplinary research approaches. Opportunities for research collaboration between countries enhance the scope of work that can be accomplished.

**Keywords:** assistive technology, incontinence, nutrition, international collaboration

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E. VAN DEN HEUVEL. *Developing and evaluating assistive technology for continence problems. Gerontechnology 2010;9(2):126-127*; doi:10.4017/gt.2010.09.02.114.00

**Purpose** 200 million adults worldwide are estimated to suffer from urinary incontinence<sup>1</sup>. A significant proportion of sufferers manage their continence needs with pads. This can seriously affect quality of life<sup>2</sup>. As part of a project entitled, 'Tackling Ageing Continence through Theory, Tools and Technology (TACT3)', we are developing and evaluating 2 assistive technologies that have been requested by continence pad users. We introduce these assistive technologies and discuss our current methods of evaluating efficacy. **Method** The International Consultation on Inconti-

nence Questionnaire - Urinary Incontinence (ICIQ-UI) short form<sup>3</sup> is being administered before the participants test the device. During the 2-week trial period participants complete a daily diary. On completion of the trial the ICIQ-UI Short form will be repeated to act as a control. Participants will also be asked to complete ICIQ-Lower Urinary Tract Symptoms Quality of Life<sup>4</sup> and the Psychosocial Impact of Assistive Devices Scale (PIADS)<sup>5,6</sup>. We have also developed our own device specific questionnaire to assess performance and user preferences.

**Results & Discussion** We will be exploring the first results from our 'Smart underwear' device testing and discussing the limitations of our current outcome measures. Although ICIQ-UI Short form, ICIQ-LUTSqol, and PIADS are validated scales, none of them are specifically aimed at detecting the impact of assistive technology for continence. Our smart underwear is not designed to improve incontinence symptoms so we don't expect to detect any improvements with the ICIQ scales. The PIADS scale is a generic outcome measure for assistive devices, measuring changes in adaptability, competence and self-esteem. It is likely that this scale will be less sensitive to the continence technology we are developing because the main anticipated impact is in the area of confidence and self-esteem rather than any improvement in functioning. Our Canadian partner will be working closely with us to develop a specific outcome measure for the type of technology that we are developing.

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J. J. JUTAI, K. SOUTHALL. *Development and validation of a questionnaire to measure the psychosocial impact of assistive technologies for continence in elderly individuals. Gerontechnology* 2010;9(2):127-128; doi:10.4017/gt.2010.09.02.115.00 **Purpose** Continence problems can cause embarrassment and distress to older adults because they signify a loss of control, social stigma and encroaching dependency, all of which threaten self-esteem and self-identity<sup>1</sup>. Self-stigma is an important variable to include in health research because it can serve as an obstacle to seeking health care services<sup>2</sup>. This 3-year study supplements the work of a project entitled, 'Tackling Ageing Continence through Theory, Tools and Technology TACT<sup>3</sup>'. The goal is to develop and validate a questionnaire to measure the impact of continence technologies on the quality of life of elderly individuals. **Method** This project investigates adaptation of the Psychosocial Impact of Assistive Devices Scale (PIADS)<sup>3,4</sup> to measuring the impact of continence devices. Research syntheses on psychosocial factors associated with continence and incontinence have been done. Interviews and focus groups addressing psychosocial impacts of assistive technologies for continence are being conducted with elderly individuals, caregivers, and health care professionals. Finally, an ethnographic study design is being used to investigate the self-stigma associated with age-related conditions such as continence problems<sup>5</sup>. **Results & Discussion** The research syntheses, interviews and focus groups are being used to help determine to what extent the PIADS captures important areas of impact, and identify what modifications and enhancements might be needed. C-PIADS (an adapted PIADS) will be pretested with samples of elderly device users and their caregivers to ensure that the questions and response formats are understandable and acceptable. The internal consistency and test-retest reliability of the new instrument will be examined. Finally, the validity of the C-PIADS will be examined to evaluate 2 assistive devices (odour sensor and wetness sensing smart underwear) that have been requested by continence pad users themselves. Results of this study will be informative to health practitioners who work with aged clients, as they will provide vital clues on how to help circumvent or mitigate the negative impacts of self-

stigma, improve their overall health condition and autonomy, and increase access to health care services for continence management.

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**Keywords:** assistive technology, continence management, outcome measures, self-stigma

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A. ASTELL, T. ADLAM, F. HWANG, E. WILLIAMS. NANA: Novel assessment of nutrition and ageing. *Gerontechnology* 2010;9(2):128; doi:10.4017/gt.2010.09.02.116.00 **Purpose** NANA is a 3-year project using sensitively-designed technology to improve data collection and integrate information on nutrition, physical and cognitive function and mental health to identify individuals at risk of under-nourishment and improve targeting of interventions. This research will also improve our understanding of the interactions between these factors, in order to better medical treatment and social provision. The toolkit has potential for commercial development for additional segments of the population. **Method** This is a multi-disciplinary program involving psychology, nutrition, engineering and software engineering. The first phase is a user needs analysis and will involve consulting with a broad cross-section of older people, caregivers, and health professionals, to establish what technical approaches would be useful and acceptable. The second phase focuses on the development of an integrated measurement toolkit. There are three inter-related subsections: (i) an iterative program to develop the assessment technology, (ii) techniques for dietary assessment in older people, and (iii) a parallel investigation of measures of cognition and mental health in older people. It includes a full validation of the assessment toolkit and will comprise a comparison of the new, integrated assessment with traditional 'pen and paper' methods with volunteers having the equipment installed in their homes.

**Keywords:** assistive technology; nutrition; mental capacity

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A. MIHAILIDIS, Y. ESKIN, E. ROCHON, A. ASTELL, T. ADLAM. The extension of the COACH prompting system to nutrition-related activities among older adults. *Gerontechnology* 2010;9(2):128-129; doi:10.4017/gt.2010.09.02.117.00 **Purpose** The goal is to develop an intelligent home that is able to pervasively monitor an older adult (with or without dementia), providing reminders, prompts and guidance. This may include simple reminders to help find misplaced items, reminders of critical events, and/or actively monitoring the person through activities of daily living (ADL) tasks or steps. We developed a prototype intelligent home technology, and an automated prompting system called the COACH, which is able to track the actions of an older adult during an ADL task, and provide verbal and/or visual prompts. We are currently expanding the current COACH system to include other ADLs. The objective of this new collaboration with the current UK NDA (the NANA project), is to extend our system to include meal preparation and eating. The NANA project aims at becoming a comprehensive assessment tool, to facilitate the collection of detailed information from a cross-section of older people, with respect to their nutritional intake and related tasks. This work builds upon a new, technology-based, assessment toolkit to also include advanced monitoring and prompting algorithms. **Method** We are currently developing computer vision algorithms that automatically recognize different food types on a plate and automatically calculate the portion size. This system will automatically log the nutritional intake of a specific user and ensure that it is appropriate. The computer vision techniques will include image processing such as background subtraction (to isolate the food pieces from the rest of the background), algorithms to detect specific features of the food, such as colour, texture, and shape, and a statistical-based classifier to categorize the type of food being eaten. The completed system will then be tested with a variety of food types and environmental conditions. **Results & Discussion** We expect to have a developed system by December, 2010, and then clinical results by April, 2011.

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L. DAMODARAN, W. YOUNG, S. BORNSTEIN, V. GADAG, G. FARRELL, L. GIEN, G. KLIMA, C.W. OLPHERT, S. TOMBLIN. *Sustaining information technology use by older adults to promote autonomy and independence Gerontechnology 2010;9(2):129; doi:10.4017/igt.2010.09.02.242.00* **Purpose** Digital ICTs have the potential to support older people to live independently, promote social inclusion and facilitate access to many services. The Sus-IT research program is investigating the barriers to sustained and effective use of ICTs by older people, through a range of potential solutions, including the development of new adaptive technologies. Consequently the Sus-IT program team brings together many disciplines and skills including participatory and user-centred design, psychology, gerontology, sociology, computer and information science, human-computer interaction, interactive theatre and learning technologies as well as practitioners, product developers, local government, assistive technology providers and disability organisations. Some specific objectives of the study are to establish the level of digital engagement among seniors, to examine the socio-demographic determinants of digital engagement, to discover the type and extent of ICT support, to discover the preferred learning modalities, and to develop, then deliver, an intervention that will improve the level of digital engagement. **Method Phase 1.** The digital engagement questionnaire developed by the parent Sus-IT team will be modified for local use and, using a stratified random sample, will be administered by phone to 600 seniors. We will oversample the older seniors. Analysis of questions will be done using descriptive & multivariate analysis, and GIS techniques. The results will be presented to the respondents in forum settings and their reactions will be analysed. **Phase 2.** A multidisciplinary symposium will be held to identify potential solutions to the ICT needs. For our intervention, we will choose a feasible semi-automated adaptive ICT solution to the needs expressed by our participants. We will use the Switching Replications Design to test the ICT solution. An early group will have the solution installed on the computer they use. Six months later, the digital engagement questionnaire will be re-administered to all participants. If the solution is effective then the research team will apply for additional funding so that the control group will also have the solution installed. We would again administer the questionnaire to both groups after a further 6 months. The program includes two cohorts whose people have a variety of unique characteristics that would enrich and extend the contextual validity of the Sus-IT findings: a Canadian cohort in the province of Newfoundland and Labrador, and a Scottish cohort at the University of Dundee. **Results & Discussion.** Emerging findings reveal the benefits that digital engagement provides for older people as well as the challenges they have overcome.

*Keywords:* independence, IT, learning, ageing

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