A. SIXSMITH (Convener) **Key themes in North American gerontological research.** *Gerontechnology 2014;13(2):130;* doi:10.4017/gt.2014.13.02.265.00 **Participants** A.Sixsmith (Canada), R. Woolrych (Canada), C. Berridge (USA), A Sterns (USA). **Issue** In recent years the field of gerontechnology has expanded rapidly, bringing about the development of new technologies to facilitate ageing-in-place[1-4]. Alongside this technological development, there is a need to consider the broader impacts of the application of this technology on the end user, to explore the role of technology as a data collection tool, and to identify the potential benefits of industry-academic collaboration in technology design. **Content** Contributing to each of these key themes, this symposium discusses findings emerging from gerontechnology research conducted in the USA and Canada. **Structure** There will be four oral presentations. Dr. Berridge will present results from qualitative research undertaken with older adults, healthcare professionals, and family members to examine the social and ethical considerations of using remote monitoring (RM) technologies, focussing on issues of self-determination, autonomy, privacy, and power. Dr. Sixsmith will present information on the development of an Experiential Sampling Methodology to capture mood, behaviorial, and contextual data among older adults living with bipolar disorder. Dr. Woolrych will discuss the use of video surveillance data to investigate falls among older adults in long-term care, demonstrating the potential of video data for generating in-depth understanding of how and why falls occur in long-term care and reflecting on video as a potential tool for education and knowledge transfer. Dr. Sterns will present findings from an ongoing industry/academic collaboration to develop innovative products and applications that support older adults to age-in-place, including a medication dispensing system and mobile application to monitor health status. **Conclusion** The symposium will highlight innovative themes emerging from gerontechnology research conducted in North America. This will be followed by discussion with symposium participants to identify opportunities and challenges from other regional contexts.

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C. BERRIDGE. **Power, ethics and normative logic related to voluntary remote monitoring used to provide independent living** *Gerontechnology 2014;13(2):130-131;* doi:10.4017/gt.2014.13.02.278.00 **Purpose** The social and ethical considerations of emerging remote monitoring practices with older adults are seldom discussed in the empirical literature[1-3]. Remote monitoring (RM) technology is commonly described as a tool used to enhance independence, yet older adults and caregivers have also expressed concerns that RM undermines independence, self-determination and choice[4]. Focus group and pilot study participants express fear that RM will reduce privacy, act as 'big brother', or undermine the ability of the elderly to keep information about themselves private for their own personal reasons[4,5]. The unique contributions of this study are four-fold: it explains the ethical implications of elder care practices related to independent living; it examines discontinuation; it is based on a non-pilot real-world situation with six years of organizational use; and its sample a population that includes ethnically diverse residents of subsidized senior housing. **Method** Forty-six in-depth interviews were conducted in English and Korean with current resident users, former users, social workers, and family members serving as emergency contacts for residents of six low-income independent living residence buildings in a USA city. Participants were ethnically diverse; more than half were born in one of ten different countries. The majority of resident participants had home aide services and all had multiple chronic conditions. **Results & Discussion** Three interre-

lated ethical issues will be presented. The first is the issue of elder self-determination. Techniques include engaging family and peers to encourage adoption of RM, "revisiting" the option multiple times if a resident had initially declined RM, and presenting adoption as the right thing to do through moral discourse related to self-care. The second issue is the potential threat to autonomy and control over one's life that is embedded in the design of the passive monitoring systems. The expectation of a regularity of routine in one's daily life, coupled with no other viable options for the older adult to control their own lives, can present a problem for some users and cause them to discontinue use of RM. Third, examples will be presented of how privacy and incidental findings are perceived and handled in practice. The ways in which older adults, family members and social workers negotiate needs, concerns, caregiving, responsibility and prevention techniques are reflexive, relational practices. They have ethical aspects and implications. Findings reveal that passive monitoring systems can become coercive if the rights of the elderly to refuse or discontinue use are not respected. The interaction of power dynamics in the decision making process with potential threats to autonomy and privacy will be discussed.

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A. Sixsmith, H. Yaghoubi-Shahir, U.G. Laesser, N. O'Rourke, M. Sadhegi, M. Razmara. ***Developing a mobile experience sampling tool for investigating bipolar disorder in seniors***. *Gerontechnology 2014;13(2):131-132;* doi:10.4017/gt.2014.13.02.382.00
Purpose This paper describes an Experiential Sampling Methodology Tool (ESM-Tool) for use in clinical and health-related research. The ESM-Tool uses a mobile smart device to prompt people to complete a set of questions about their psychological state, as well as to capture GPS activity data. In this way, the ESM-Tool attempts to tap into people's 'real-time' experience, rather than depend on retrospective accounts. While it can be used in many research contexts, the ESM-Tool has been developed as part of the BADAS project[1] to investigate bipolar disorder (BD) amongst seniors, a chronic condition that accounts for 20% of all mood disorders among older adults. BD is a chronic mental disorder characterized by extreme variations of mood, where the sequence, timing, severity, and duration of manic and depressive episodes vary widely. The use of research methodologies that are able to collect real-time data on mood and context can facilitate a deeper understanding of BD in seniors. The rapid growth of mobile smart devices in recent years provides a massive opportunity to develop these kinds of research tools. **Method** The ESM-Tool uses a mobile smart device to prompt users to complete a set of questions about their immediate psychological state, perceived health status, their activities, and their everyday circumstances, as well as collecting data on patterns of activity using the mobile device's GPS function. Data is transferred by a secure communications link to a back-end system that includes the survey database and a web interface for researchers to configure and manage individual surveys. The development of the tool comprised a number of stages. An initial stage involved state-of-the-art review, along with end-user and expert consultations to determine the tool requirements. A modeling approach was utilized to describe requirements independent of specific device platforms. In the second stage, the ESM Tool was implemented on smart devices (currently iPhone and iPad) and tested in a process of iterative prototype development to optimize functionality, usability, and acceptability with potential end-users. In

the third stage, the ESM Tool(s) was piloted with expert testers and older adults with BD. **Results & Discussion** The ESM-Tool is a novel methodology for researching BD with many advantages over alternative methods (e.g. paper diary), including notably higher reliability and the ability to automatically record movement and location, connect with devices such as biomedical sensors, and connect with exogenous data (e.g. temperature and weather conditions). The ESM-Tool has been tested and evaluated in an initial trial. Feedback from potential end-users was very positive and suggested further improvements in ease-of-use, such as improved notifications to complete the survey. A comparison of the ESM-Tool's recorded survey data with parallel paper and pen survey completion confirmed the tool's accuracy. Evaluation within the team also suggested operational improvements to the researcher interface. The tool can be used in many other research contexts, and has potential for use in clinical contexts such as diagnostic assessments and self-management of mood- disorders or other chronic conditions. Further refinement and testing is planned prior to deployment in the empirical phase of the BADAS project.

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R. Woolrych, A. Zecevic, A. Sixsmith, J.Sims-Gould, F. Feldman, S. Robinovitch. **Exploring the potential of using real life video capture to investigate the circumstances of falls among older adults in long-term care.** *Gerontechnology 2014;13(2):132-133;* doi:10.4017/gt.2014.13.02.264.00 **Purpose** Falls are the leading cause of injury for residents living in long-term care (LTC) facilities, representing a significant cost burden and compromising the independence and autonomy of the older person[1,2]. Research into the causes of falls in LTC is limited by inaccurate reporting procedures[3]. To overcome these limitations, innovative methodological approaches are needed to establish a better understanding of *how* and *why* falls occur. While video has proven beneficial for monitoring the health and well-being of older adults[6], this potential has been less well explored in studying falls. This paper discusses the opportunities and challenges of using video monitoring of fall events in LTC facilities. **Method** The paper reports on ongoing work from a Canadian Institute for Health Research-funded research project on the use of video to identify the causes and prevention of falls in two LTC facilities in Metro Vancouver, Canada[4,5]. We discuss the opportunities and challenges of using video in observations of falls, illustrated through four methodological approaches: questionnaire-driven observational group analysis; video-stimulated recall interviews and focus groups; video observations of the resident 24 hours before the fall; and video incorporated within a comprehensive Systemic Falls Investigative Method (SFIM)[3]. **Results & Discussion** Analysis of the video data provided the opportunity for in-depth and nuanced understanding of how and why older adults fall in LTC. Video allowed a detailed analysis of fall incidents and enabled a broad range of contributory factors to be identified: intrinsic factors (gait and balance); extrinsic factors (trip hazards and physical layout of the LTC); and broader situational and organizational influences (workplace practices). As a tool for practice change, video may provide a means to identify targeted, context-specific interventions and the potential for knowledge transfer and education among caregivers. However, the use of surveillance video also raises practical and ethical challenges which need to be better understood and articulated in the application and development of video monitoring of older adults.

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Address: Gerontology Research Centre, Simon Fraser University, Vancouver, Canada
E: ryan_woolrych@sfu.ca

A. STERNS, J. HUGHES, S.KUERBITZ. **The development of a novel complex medication adherence and monitoring technology.** *Gerontechnology 2014; 13(2):133;* doi:10.4017/gt.2014.13.02.234.00 **Purpose** The State of Ohio has initiated a number of programs to support collaborations between Ohio universities and Ohio companies. Under the umbrella of the Ohio Third Frontier Program (OTF)[1], block grants have been made to institutions to support incubators and other similar services, as well as focused loan and grant programs administered by the OTF itself. One such program is the Technology Validation and Start-up program. This program requires University-developed technologies to be validated in collaboration with an industry partner and operates in two phases. The first phase is for feasibility testing and the second phase is to support demonstration and commercialization. iRxReminder LLC, an Ohio-based start-up, developed a smartphone-based data gathering system consisting of a cloud-based control center and an app. The iRxReminder app supports complex medication schedules, is customizable to track symptoms, and can present patient education podcasts. Kent State University utilized the system for a study of heart failure patients. During the study, limitations in confirmation of medication dispensing were found to obscure the results of the study. Jointly, a medication dispensing and tracking system was designed that would interoperate with the iRxReminder system. A Phase I application for the Technology Validation and Start-up program was filed with OTF and awarded. Subsequently, a joint patent was filed, a prototype was completed, and a human factors test was conducted. **Method** Structured interviews were conducted with 16 heart failure patients selected from a pool of hospital patients who indicated that they would participate in the research. The participants varied in age from 54 to 87 years with an average age of 68 years. Participants reported taking between 4 and 36 medications and supplements per day with an average of 12 medications. **Results** The iLidRx system was explained to the participants, and then participants were asked about specific aspects and how useful these would be to the participants in supporting their medication regimen. Participants rated on a seven-point scale that the system and the use of a green LED on the top of the pod were very clear in indicating what medications to take and when to take them (6.5 out of 7.0). The participants also indicated that the alerts on the smartphone were very useful (6.5 out of 7.0), and those participants who were interested in monitoring (25%) indicated that this was very useful as well (6.7 out of 7.0). Following the success of Phase I, a Phase II project was designed to apply the complete system, control center, app, and medication dispensing system, called the iLidRx (*Figure 1*), to aid the recovery of patients following hematopoietic stem cell transplant therapy, commonly known as bone marrow transplant. Another OTF-supported entity, the Great Lakes Innovation Development Enterprise Innovation Fund, has awarded a grant to support a pilot (http://www.innovationfundneohio.com). Additional support has been sought from the Technology Validation program.

Reference

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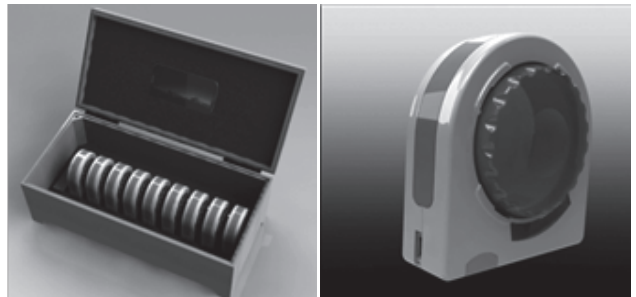*Address*: The University of Akron, Akron, OH, USA; *E*: asterns@irxreminder.com

Figure 1. The iLidRx medication dispensing cabinet (left) and the individual pill dispensing device (PDD) or 'pod' (right)