E. VAN DEN HEUVEL (Convener). Tackling ageing continence through theory, tools and technology. Gerontechnology 2010;9(2):111; doi:10.4017/gt.2010.09.02.023.00 **Participants**: *A. LONG (UK), G. KNIGHT (UK), E. VAN DEN HEUVEL (UK),* and *J. JUTAI (CANADA).* **ISSUE** Incontinence is very common in the adult population and prevalence increases with age. Three main factors contribute to making continence issues a major problem for large numbers of older adults; (i) urinary system function declines with age; (ii) increasing prevalence of concomitant diseases (for instance, diabetes, high blood pressure, Parkinson's, Alzheimer's, etc.) that can result in increased frequency and urgency of the problems; (iii) mobility problems are increasingly common in older people and any limitation in mobility is likely to cause difficulties with continence simply because the older person finds it difficult to reach the toilet and transfer onto it. The stigma associated with continence issues is an obstacle to both sufferers and professionals working in this field. **CONTENT** This symposium will review the continence issues for older people and present some of the existing technology associated with continence management. We will report progress of a major UK/Canadian-linked project that is aiming to reduce the impact of continence difficulties for older people. The papers will report on inclusive design issues for continence in the built environment and the development and clinical evaluation of two assistive technology products for continence pad users. We will also report on the development of a specific outcome measure for continence technology. **STRUCTURE** Adele Long will present a background in continence issues for older people including prevalence, patient issues, treatment options and the role of technology. She will introduce the TACT3 project. Gail Knight will explain the use of inclusive design methodologies to understand user preference in the design and provision of lavatory facilities available when away from home, and to identify barriers that prevent both access to facilities and the form of provision users wish to see. She will present the results of 100 interviews with toilet users across the life span. Eleanor van den Heuvel will present the development of two assistive technologies that have been requested by continence pad users (i) Smart Underwear that alerts the wearer to a pad leak before urine spreads to outer clothes and (ii) an Odour detector that responds to subliminal quantities of ammonium warning the wearer to change pads before the odour is detectable to the human nose. She will report early findings from clinical tests. Jeff Jutai will critically review the literature on outcome measures and describe the development of a self-report instrument for assessing the impact of continence technology on older patients. **CONCLUSION** Although continence problems are widespread, the social taboo associated with this topic is a significant barrier to research and development in this fundamentally important area. This symposium will present some of the challenges and successes for technology development in this field.

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A. LONG, J. WORTHINGTON, H. GODFREY. The role of technology in the management of continence in older people. Gerontechnology 2010;9(2):112; doi:10.4017/gt.2010.09.02.024.00 **Purpose** Urinary incontinence (UI) in adults is defined as the 'the complaint of any involuntary leakage of urine'[1]. This encompasses many disabilities of the bladder and urinary tract including voiding difficulties. Worldwide it is estimated that over 200 million people have significant incontinence[2]. The prevalence of UI is known to increase with age, is more common in women and is highest among the elderly in nursing homes[3]. There are still many stigmas attached to incontinence and it has a huge impact on quality of life. Treatments can be with drugs or operative procedures, but for many older people bladder management with the aid of devices and continence products is the most realistic option. This abstract outlines research undertaken by the BioMed Health Technology Cooperative into the perspectives of older people[4] and the development of devices and products for continence management[5] giving the background to TACT3. **Method** To explore the impact of continence difficulties on social interaction, we undertook semi-structured interviews with 20 older people recruited from community care services. The data was subjected to thematic analyses to identify key dimensions. Using the Health Care Technology Cooperative model for the development of user-friendly continence products, we investigated the range of products on the market, their availability and their strengths and limitations and approaches to future design. **Results & Discussion** Eight themes were identified from the literature and our study identified a number of coping mechanisms that related to the use, and modifications to the use, of devices and products. Social isolation, however, related more to the older person's attitude, the quality of support from family or friends and the presence or absence of compelling interests. Continence products and devices employ absorbency (pads), occlusion (urethral or vaginal plugs) or collection (catheters, sheaths or urinals). In general, these are designed to alleviate symptoms, but many have limitations which result in user or carer inconvenience, embarrassment and, in some cases, compromise to health. The development of products that are either requested by users or in which users are engaged is advocated to ensure that design meets user as well as clinical requirements.

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J-A. BICHARD, G. KNIGHT. Designing out environmental barriers to public toilet provision for an aging population. Gerontechnology 2010;9(2):112-113; doi:10.4017/gt.2010.09.02.025.00 **Purpose** Besides dementia, nothing is more feared by many older people than incontinence. Whilst the aging population in the UK grows, Help The Aged has found that the number of available public toilet facilities has dramatically declined[1]. Due to toilet access difficulties, many older people limit the time and the distances that they are away from home, reducing their quality of life[2]. This paper will discuss Work Package 2 of the TACT3 3-year research project. This consists of inclusive design research work by the Royal College of Art Helen Hamlyn Centre into the environmental barriers that many older people face when attempting to access toilet facilities away from home. The aim of the first year of work is to research the experiences and concerns of individuals when addressing their toilet needs in order to design solutions that would

facilitate use. **Method** To design inclusively, we created a methodology that involved interviewing 101 people from ages 0 to 100, some with conditions such as incontinence that exacerbate the effect of existing barriers to using away-from-home facilities. We asked users about their experiences and concerns, and gained insights into how toileting needs develop as a person ages. This methodology relies on the premise that designing with a wide range of individuals in mind, in particular 'extreme users', will lead to designs that benefit all. **Results & Discussion** By mapping the insights gathered from the user interviews, the researchers could generate 9 different aspects of away-from-home toilet facilities of importance to users that would benefit from design intervention. These 9 aspects are: Journey (Information & Planning), User Experience, Security, Hygiene, Product Design, Provision, Location, Architecture, and Privacy. As an initial response, the research team proposed a set of design concepts on the top three themes of Hygiene, Journey and Provision to present to a focus group of previous interviewees. This included a recognisable brand standard that would rate toilets via ratings submitted by the general public using a portal in the exit of the facility, as well as a series of designs on provision and segregation which addressed the gulf between standard and 'accessible' cubicles that affects many older users. This focus group approach allowed the participants to maintain their involvement and develop solutions in collaboration with the researchers. The results of year 1 will be presented to the providers of away-from-home toilets as well as architects, developers and toilet attendants, through a series of 'extreme user' profiles. These providers will also be interviewed to understand the barriers to providing the facilities that users want. Year 3 will see a consolidation of user and provider perspectives to create detailed designs that improve and facilitate future away-from-home toilet provision.

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E. VAN DEN HEUVEL, F. JOWITT. Assistive technology for continence management issues. Gerontechnology 2010;9(2):113-114; doi:10.4017/gt.2010.09.02.026.00 **Purpose** Large numbers of adults, particularly women, have problems with urinary incontinence. Although treatments are able to help around 70% of sufferers[1], a substantial number of people are dependant on pads for their continence management needs. The world retail value of incontinence pads in 2006 was estimated to be over three billion dollars. Continence pad users report significant reduction in quality of life[2,3]. The two highest ranked concerns for daytime pad use were found to be containment of urine and smell[4]. Concerns about pad leakage and odour have a significant detrimental effect on the lives of pad users. The aim of this work is to develop technologies that can discreetly alert pad wearers to a leak or an odour before other people become aware of the problem. **Method** A focus group based user centred design methodology has been used to determine the key features of these two devices. A unique colour change indicator has been developed at University West of England that can detect stale urine odour before the human nose. Tests with urine donated by people with continence difficulties are being carried out to tune the specificity and reliance of the indicator. Underwear that can detect a pad leak and discreetly alert the wearer has been developed by Manchester University. **Results & Discussion** Our focus groups have supported the literature finding that leaks and odour are major concerns for pad wearers. Essential design features identified by participants include discretion, range of attractive design options and complete reliability. Initial, healthy volunteer tests have shown that the pad leakage detecting underwear works functionally. The underwear will be tested by a pilot group of patients and these results will be presented. The discussions with focus group volunteers have shown that even amongst the small number of participants, there is a huge range of causes of continence problems. There are also many factors apart from odour and leakage, relating to their incontinence, which can influence their quality of life.

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J. JUTAI. Outcome measures for continence technology. Gerontechnology 2010;9(2):114-115; doi:10.4017/gt.2010.09.02.027.00 **Purpose** Continence problems cause embarrassment and distress to the sufferer because of what they signify to the older person - loss of control, social stigma and encroaching dependency, all of which threaten self-esteem and self-identity[1]. This project is developing and validating a questionnaire to measure the impact of continence technologies on the quality of life of elderly individuals. It includes investigating how a well researched instrument, the Psychosocial Impact of Assistive Devices Scale (PIADS)[2-3], might be adapted specifically for measuring the impact of continence technologies. This paper will summarize the results from systematic reviews and progress in developing a self-report instrument for assessing the impact of continence technologies on older patients. **Method** Systematic reviews of the literature on continence outcome measurement and the effectiveness of continence management technologies were conducted. Interviews and focus groups are underway with elderly individuals who have continence problems, their caregivers, and health care professionals who are knowledgeable and experienced in this area. The systematic reviews, interviews and focus groups will help determine how well the PIADS seems to capture important areas for impact of continence technologies and what modifications and enhancements might be needed. Research evidence was evaluated using the Downs and Black scale[4]. The following strength-of-evidence levels were applied: Level 1a (very strong), the findings were supported by the results of two or more studies of at least 'excellent' quality; Level 1b (strong), the findings were supported by at least one study of 'excellent' quality; Level 2a (moderate), the findings were supported by two or more studies of at least 'good' quality; Level 2b (limited), the findings were supported by at least one study of 'good' quality; Level 2c (weak), the findings were supported by at least one study of 'fair' or 'poor' quality; Level 3 (consensus), in the absence of evidence, agreement by a group of experts on the appropriate treatment of course; Level 4 (conflicting), disagreement between the findings of at least two randomized controlled trials. **Results & Discussion** The best-researched technologies are the following (in parenthesis are the number of research studies evaluated and the level of strength of evidence assigned to each type of technology): Electrical/magnetic stimulation (4; Strong 1.b); Biofeedback (2; Moderate 2.a); Artificial urinary sphincter (3; Weak 2.c); Urinary insert (2; Weak 2.c); Pessary (1; Weak 2.c); Reusable undergarment (1; Weak 2.c); Implantable urinary device (1; Weak 2.c). Conclusions from this systematic review include: the strongest evidence is for electrical/magnetic stimulation devices; the best available research has been done on medical (in comparison with assistive) technologies; there is a dearth of research evidence on the psychosocial impact of technologies. From the review of outcome measurement tools designed specifically for continence/incontinence, conclusions include: there are reasonably well researched instruments available which were designed principally to assess the health-related quality of life impact of incontinence symptoms[5]; they have not been used consistently or extensively in technology effectiveness research; their validity for evaluating the effectiveness (especially the psychosocial impact) of assistive technologies is unknown.

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