

GERONTOLOGY
RESEARCH CENTRE

SENIORS' HOUSING UPDATE

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Conference theme is
"Technologies for Health, Quality
of Life and Aging-in-Place."

Housing-related highlights:

May 27 – site visits to 3 projects
built to SAFERhome™ standards

May 28 – Symposium "Robotics
and the Changing Workforce:
Examples from the Housing
Domain"

Paper Session "In Home Activity
Monitoring and Sensors"

May 29 – Symposium "Active and
Passive Monitoring Technologies
to Support Aging-in-Place"

Paper Session "Ambient Assisted
Living"

Keynote Address "What is the
Contribution of Technology to
Aging-In-Place?"

May 30 – Symposium "The
Design Process for Inclusive
Environments and Technologies"

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INTERNATIONAL SOCIETY OF GERONTECHNOLOGY 7TH WORLD CONGRESS, VANCOUVER, 27TH-30TH MAY 2010

ISG2010 will be held at the Marriot Pinnacle Hotel in Downtown Vancouver. Over 400 registrants from all over the world will be able to hear a record number of presentations and poster sessions. Highlights of ISG2010 will be:

KEYNOTE SPEAKERS FROM CANADA, FRANCE, SWITZERLAND, TAIWAN AND THE UK

- Twenty-seven invited and submitted symposia
- Paper sessions with over 80 papers on all aspects of technology and aging
- Five poster sessions with over 80 posters covering dementia, design issues, health management, using technology in everyday life and user aspects
- Expert round tables
- Exhibition
- GerontechnoPlatform, featuring demonstrations of state-of-the-art products
- MasterClass for students
- Social program including dinner cruise and salmon barbeque

It is still possible to register for ISG2010, please visit <http://www.sfu.ca/isg2010/> is hosting at the Marriot Pinnacle Hotel, 27th-30th May.



Reducing distraction in hospital bedrooms can help older adults learn post-discharge instructions

T. Love, MA (Gerontology), G.M. Gutman, PhD, FCAHS, OBC

Commonly, people leaving hospital need some amount of instruction concerning what to do when they get home and what to watch out for in the way of negative signs and symptoms. For many people learning post-discharge instructions is problematic. Studies have shown that less than half of patients are able to state their diagnosis, name their medication(s), state what the medication was supposed to do for them or list possible major side effects (Alibhai et al., 1999; Makaryus & Friedman, 2005), often leading to drug related problems (Paulino, Bouvy, Gastelurrutia, Guerreiro & Buurma, 2004).

The causes vary, including inappropriate literacy level of the instructions (Jolly, Scott, Feied & Sanford, 1993; Safeer, & Keenan, 2005) and insufficient (or no) time spent teaching the discharge plan (Alibhai, Han & Naglie, 1999). While these factors can affect patients of any age, older adults may have even greater difficulty learning post-discharge instructions due to age-related changes in sensation and perception (Harris & Reitz, 1985; Jolly et al., 1993; Safeer & Keenan, 2005), higher risk for delirium (Litton, 2003) and more rapid functional decline (Creditor 1993; Zorowitz, 2002). While it is widely believed that learning becomes more difficult with age (Craik & Bosman, 1992; McDowd, 1996; Salthouse, 1996; Tulving, 1983), Botwinick (1973) argues that the problem is insufficient learning not declining memory skills.

This article reports on a study that was part of a pilot project concerned with the elder friendliness of acute care hospitals in the Fraser Health Authority (FH). FH encompasses a geographic region in British Columbia's lower mainland serving a population of 1.5 million people, 12.4% of whom are aged 65 and over (Wister, Gutman,

Adams & Chou, 2006). In FH, adults aged 65 and over make up approximately one-third of hospital cases and account for 55% of inpatient hospital days (Parke & Friesen, n.d.).

The theoretical framework for the research was Lawton and Nahemow's (1973) Ecological Model and accompanying Environmental Docility Hypothesis (Lawton & Simon, 1968) which postulate that as competency declines, people are less able to cope with "environmental press." In the case of patients receiving post-discharge instructions, auditory and visual distractions in a typical hospital patient bedroom represent "environmental press" and their admitting condition, the mechanism whereby "normal" competency is reduced. For older adults press is further exacerbated by age-related decreases in the ability to ignore irrelevant aspects of the environment (Hasher, Stoltzfus, Zacks & Rypma, 1991; McDowd, 1996; Winocur & Moscovitch, 1983).

This research tested the hypothesis that reduced auditory and visual distraction would result in better learning of post-discharge instructions by older adults. It was also hypothesized that stress, as reflected in a measure of body movement (i.e. fidgeting) would be greater in a typical hospital room than in the room modified to be less noisy and distracting.

METHOD

The study was conducted in two four-bed rooms in Burnaby Hospital. The rooms were typical (Gutman, Sarte, Parke, & Friesen, 2005) of those found in older hospitals in FH. One room remained in its original state; the second was modified to reduce visual and auditory distraction. First in one room and then in the other, 36

older adults watched videotaped post-discharge instructions. Half received post-discharge instructions for hip fracture patients in the first room and for congestive heart failure patients in the second. The other half received the hip fracture instructions in the second room. After each viewing and again after approximately 24 hours their retention of the instructions was tested.

Eligibility criteria for participating in the study were: aged 75 or over, community-dwelling, fluent in English, able to hear normal speech with minimal difficulty (with a hearing aid if used), able to read letters the size of newspaper print (with glasses if used). Possible participants were excluded if they had a movement disorder (e.g. Parkinsons) or cognitive impairment (e.g. Alzheimer's or other dementia), knowledge of hip fracture or congestive heart failure (CHF) through either personal experience, as a family caregiver or having been employed as a health care professional. The final sample ranged in age from 75-90 (mean age= 80.17 yrs., s.d. = 4.45), 75% were female, 84% lived alone.

In addition to aesthetic changes that made the room look less institutional, modifications were made to reduce both noise and visual distraction. These included installing a dropped ceiling with sound absorbing ceiling tiles, covering the terrazzo flooring with 4mm rubber flooring and hanging bed curtains that had more folds, were longer and were made of a denser weave fabric than is typical in FH hospitals. (See Figures 1 & 2).

To determine the effect of each change, sound level measurements were taken in both rooms. Overall, there was a substantial reduction in decibel levels in the modified room (6.36dB to 32.40dB depending on location). It should be noted that a 12-point reduction in decibels is equal

to reducing the number of voices heard from 16 to one (Ahuja, 1999). The greatest sound reduction came from the dropped ceiling and heavier curtains with only a minimal decrease attributable to the rubber floor.

In most previous studies, modifications have been made to the physical environment of care settings concurrently with changes in staffing and/or care policies and procedures. A unique feature of this research is the strict attention paid to limiting the cause of potential differences in learning to differences in the physical environment.

RESULTS

Analysis of instruction retention scores yielded no significant main effects. There were however significant room type x instruction type x order interactions in both immediate and delayed testing. Correlation analysis revealed significant relationships between age and both immediate and delayed retention test scores when post-discharge instructions were delivered in the “typical” room and between age and CHF instructions, the more difficult of the two sets of post-discharge instructions all study participants learned. These findings suggest that the oldest participants had the most difficulty when faced with learning the more difficult instructions in the less supportive environment.

Analyses of data from the “fidget chair”, the chair beside the bed that study participants sat in when waiting for the instructional video to come on, which was equipped with sensors that recorded body movement, revealed no main effect for rooms in the first or second five-minute waiting period. However, there was a significant main effect for room type when the instructional video was playing. Further examination of the data revealed a consistent pattern of change in body movement (“fidgeting”) in both rooms with scores dropping from the first to the second five-minute waiting period and rising again during the video. As shown in Figure 3, the rise was greater in the “typical” room.

In immediate testing, there was a significant correlation between retention scores and fidget chair scores in the

“typical” room during the video. This relationship, which was not found in the modified room, could be a result of increased movement in an attempt to hear the video, an effort that was not required in the modified room. This interpretation is supported by data from a video camera and 3 webcams that monitored participants throughout the time they were in each room. Further, movements recorded during the first five minutes are those commonly associated with boredom or impatience (e.g. looking around the room, adjusting watches/checking time or tapping fingers). However, while watching the instructions most participants were physically focused on the monitor, especially in the typical room, where they could be seen moving forward in their seat or tilting one ear towards the speaker.

DISCUSSION

The results partially supported the hypothesis that the learning of post-discharge instructions would be greater when older adults receive instruction in a hospital setting with less auditory and visual distraction. It was hoped that the room effect would be sufficiently powerful that regardless of which order participants were exposed to the rooms (“typical” first, then modified or vice versa) or which type of instruction they received in the room (congestive heart failure or hip fracture) they would retain instructions better if received in the modified room. However, learning scores only differed significantly between rooms in the delayed test. The absence of differences in the immediate test may have been due to ceiling effects or an insufficient time interval between learning and testing.

We had not predicted that there would be an age effect. However, the data revealed significant negative correlations between age and retention scores in both immediate and delayed tests when post-discharge instructions were received in the “typical” room. Age was also negatively correlated with retention scores for the more difficult (i.e. CHF) instructions. What these data suggest is that, for seniors in the oldest-old category (over 80 yrs of age), having to



Figure 1: Typical Room



Figure 2: Modified Room

learn and retain complex post-discharge instructions in a room with visual and auditory distraction is problematic. This interpretation is consistent with Lawton and Simon’s (1968) Environmental Docility Hypothesis and Lawton and Nahemow’s (1973) Ecological Model, both of which suggest that as a person’s competence decreases (as with age or illness), so too will their ability to adapt to stress from the physical environment.

The second hypothesis predicted that stress, as demonstrated by fidgeting, would be lower in the modified hospital room compared to a “typical” hospital room. The “fidget chair” data provided strong support for this hypothesis. The participants in this study fidgeted significantly more while watching the post-discharge instruction video in the “typical” room than in the modified room, with fidget rates in the “typical” room, while watching the video, being almost as high as when study participants first entered the room. If fidgeting is an indicator of stress, then

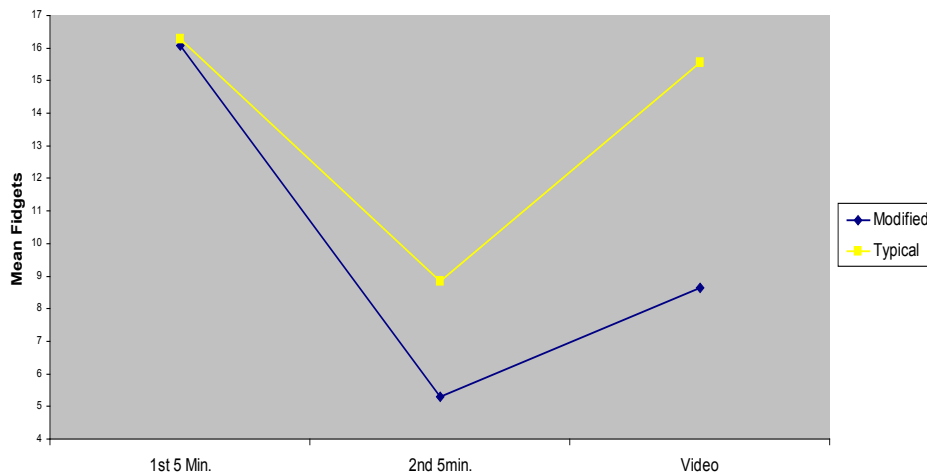


Figure 3: Mean Fidget Levels in the Modified and “Typical” Rooms by Measurement Period

participants in the “typical” room were as stressed during the video as when first entering the room.

There were several changes made to the modified room, each with differing degrees of impact on distraction. The greatest reduction in sound came from the dropped ceiling with sound absorbing tiles. The curtains reduced auditory as well as visual distraction. It is recommended that both of these modifications be given serious consideration when new construction or renovations are planned. The noise reduction achieved by the rubber flooring was minimal. As the initial cost of this flooring product is substantially greater than other flooring options, installing it primarily for the purpose of noise abatement would not be recommended.

CONCLUSION

It is possible that room effects may have been muted by the fact that participants were non-hospitalized volunteers, not “real” patients i.e. the sample may have been too healthy to maximally benefit from the modifications. Additionally, considerable time and attention was devoted to creating an instruction set that capitalized on theory and research with respect to the common learning needs of older adults. In other words, we may have done such a good job in developing the instructions that people were able to learn them despite the noise and distraction.

In any event, this pilot study yielded promising findings with respect to the

role of the physical environment in facilitating the learning/retention of post-discharge instruction.

The next step is to implement environmental changes and test learning/retention in a real patient population.

ACKNOWLEDGEMENTS

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AGE-FRIENDLY NEW WESTMINSTER: WHEELABILITY ASSESSMENT

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The built environment has a direct impact on physical activity levels. Common barriers to physical activity include built environment aspects. The Canadian Fitness and Lifestyle Research Institute (2004) studied factors impeding physical activity in various sizes of communities from the built and social environments, policy issues, and individual factors and it was concluded that many of the barriers involved the built environment. For example, the lack of sidewalks and poor maintenance of sidewalks were identified as barriers to physical activity in both larger municipalities (>1,000 persons) and smaller communities (<1,000 persons) (CFLRI, 2004). Larger municipalities were more concerned about connectivity of roads, trails, and paths and poor lighting and smaller communities were more concerned with the repair and maintenance of parks and trails. On the other hand, well-connected streets correlate positively with older adults' walking (e.g., King et al., 2003; Gauvin et al. 2008). Other studies (e.g., King, 2008; Mota et al., 2007) also identified that a lack of sidewalk maintenance was a barrier to physical activity among older adults.

To overcome barriers and to enhance participation in sport, physical and community activities, BC has established various opportunities for local communities to create more supportive environments for people with disabilities and seniors. In August 2007, a memorandum of understanding for inter-agency coordination and collaboration was established between the Ministry of Healthy Living and Sport (MHLS), Union of BC Municipalities (UBCM), 2010 Legacies Now (LN) and BC Parks and Recreation Association (BCPRA) in support of coordinated action to support local governments and communities to develop policies, services and programs to improve

local infrastructure facilitating physical activity, especially for people with disabilities and seniors (Ministry of Healthy Living and Sport, in press). Based on the memorandum, the UBCM has created five funding streams under the theme of Healthy Communities. Among these five, the Built Environment and Active Transportation (BEAT) specifically addresses age-friendly community design by improving connectivity for walking. As of 2009, a total of 24 local governments were funded. Among these BEAT communities, the city of New Westminster has highlighted the accessibility for people with mobility limitations.

Emphasizing mobility and active living, especially for people who are reliant on wheelchairs, scooters, walkers, and other mobility aids, New Westminster has designed its BEAT project to assess wheelability in the built environment. To conduct the assessment, it established a representative working group of mobility aid users and conducted a survey which was completed by over 120 respondents. It also conducted a pre-assessment to objectively measure aspects of the built environment such as sidewalk width and inclines, and two assessments focusing on dialogue, education and knowledge exchange between engineers, planners and people who use mobility aids. As an outcome of BEAT, the City produced neighbourhood wheelability maps for its Downtown and Uptown neighbourhoods. It also used the results to inform City policies, practices and design decisions related to wheelability.

Aging-in-place in Downtown and Uptown New Westminster has been observed. About 42% of all seniors in New Westminster live in these two neighbourhoods (Statistics Canada, 2009). These two neighborhoods also



have high shares of households living in multi-family housing (94.3% in Uptown and 93.8% in Downtown) (Statistics Canada, 2009). According to a survey for participants (n=121) who were not able to attend the site assessments, the most frequently cited barriers of going outside were poor design of curb cuts, presence of steep slopes, uneven surface treatments, poor construction practices (e.g., inadequate signage, lack of

alternative routes), and insufficient time for mobility aid users to cross streets in travelling Downtown and Uptown New Westminster.

As a follow-up of the BEAT, the City has proposed neighborhood infrastructure implementation strategies which enhance the mobility and comfort of people with mobility limitations. A few outcomes such as paving and sidewalk filling had already been realized, and meeting members suggested additional goals such as partnering with tourism bureaus to distribute walkability/wheelability maps. In evaluating the process and outcomes, the GRC is planning to analyze the impacts of the neighbourhood built environment on physical activity levels, well-being and a sense of community. It builds community capacity when community planning is accompanied with citizen action focusing on an issue that affects such a broad range of individuals, from parents with strollers to mobility aid users to older adults in general.

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NEW PUBLICATION

Gutman, G.M. (2009). *Seniors' environmental health literature review*. [(Report) submitted to Health Canada, Healthy Environments and Consumer Safety, British Columbia Region.]

This literature review was commissioned by the Healthy Environments and Consumer Safety Branch of Health Canada, to look at the impacts on seniors' health of four broad groups of environmental hazards: biological, chemical, radiological and climate change. Within each group, the objective was to identify what is known and what information is still needed in order to understand and develop policies and programs to protect the health of seniors from environmental hazards.

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Available in PDF-format on the GRC website: <http://www.sfu.ca/uploads/page/04/GUTMANreport.pdf> Recent Centre Activities

NEW RESEARCH- CIHR TEAM IN THE CAUSE AND PREVENTION OF FALLS IN RESIDENTIAL CARE

The GRC is part of a collaborative team from SFU and UBC led by **Dr. Steve Robinovitch** (SFU Kinesiology) examining the causes of falls in residential care and the potential of innovations in care, environmental design and assistive technologies for falls prevention and the alleviation of their consequences. The research will make particular use of new high resolution video systems installed in two nursing homes to capture incidences of falls as they occur. The GRC's **Drs. Andrew Sixsmith** and **Habib Chaudhury** will be looking particularly at the environmental risk factors associated with falling. **Bobbi Symes** (BCNAR/GRC) will be the project manager. The research will be carried out over the next five years, with \$2.5 million funding provided under the CIHR Mobility in Aging program. Further information on project website etc. will be available on the GRC website in due course.