

G. Fernie, A. Levchenko, G. Hufton. *Technology to reduce institutional cross-infection rates by improving the hand hygiene of caregivers. Gerontechnology 2008; 7(2):102.* As older people are admitted to hospitals and long term care facilities more frequently, they tend to be among the most vulnerable to nosocomial infections. In North America one in every 10 people admitted to a hospital acquire an infection and nearly 100,000 of these people die each year¹. It is estimated that approximately half of these deaths are preventable with improved hand hygiene^{2,3}. Authors in Gerontechnology typically focus on the development of technology to increase the quality of life of older people and people with disabilities living at home. However, we have found the urgency of the growing problem of antibiotic-resistant hospital acquired infections to be compelling and we have applied our bioengineering skills in an attempt to address this major concern for older people. The current practice for a caregiver is to use a dispenser to apply a small volume of alcohol-based gel to disinfect his or her hands. In the Canadian Province of Ontario the government requires this to be done on four occasions: when entering and leaving a patient zone, before performing an aseptic procedure and after possible contact with body fluids. Numerous international studies have found that hand hygiene compliance is approximately 40%. Some interventions have raised it to higher levels (usually around 60%) but it has been found difficult to sustain these levels. We have recorded the number of occasions when caregivers should cleanse their hands if following this procedure strictly and found that it averages over 400 times in an 8-hour shift. With the many competing demands and a high workload, it is not surprising that it has been difficult to increase the rate of hand hygiene compliance. **The new technology** This presentation will describe the development and early test results of a system that uses wireless technology to prompt the caregiver to cleanse his or her hands and provides personalized feedback on performance. The system comprises four components. The immediate environment around patient beds is marked using a grouping of low-powered infrared emitters that define a zone with a precise boundary. The caregivers wear a miniature receiver attached to their identity lanyard logs the time of entry and exit and identity of each zone visited. Caregivers either cleanse their hands using special wearable alcohol gel dispensers or wall-mounted alcohol gel or soap dispensers. Use of any of these dispensers causes a signal to be sent to the receiver, which logs the real time of the hand hygiene event. The receiver issues audible prompts to remind the caregiver when a patient zone is entered or exited without performing the required hand hygiene. Data can be downloaded to display the history of hand hygiene over periods of a day, a week or a month. Alpha trials are underway with caregivers in our continuing care facility. The objective of these trials has been to ensure the system meets the needs of the caregivers and to ensure that the technology performs reliably and can be installed easily. Beta trials are planned using control and experimental wards in an acute care hospital and a continuing care hospital.

References

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