R. OKSANEN, L. POHJOLA, H. FINNE-SOVERI. **A smart floor helps to prevent falls and to allocate staff time.** *Gerontechnology 2012;11(2):344;* doi:10.4017/gt.2012.11.02.448.00 **Purpose** This presentation discusses new perspectives on fall prevention and introduces a recently tested promising product. Exploitation of new practical technologies can offer more information about residents' abilities, risks, and circadian rhythms. **Method** The ELSI Smart Floor (ELSI) consists of electronic units and of metal sensor foils installed under flooring material. It is an intelligent monitoring system to improve nursing quality[1], self-empowerment, and safety of the residents and also to ease the nurses' work load. ELSI has six individual alarms (i) falling, (ii) getting up from bed, (iii) entering the toilet, (iv) staying too long in the toilet, (v) entering, and (vi) exiting the resident room. These alarms are set according to residents' care or support needs. Alarms are sent to the nurses' mobile phones, which helps nurses to be more up-to-date about residents' movements and location. This in turn helps to prevent accidents by sending the nurse only when needed to aid a high-fall risk resident with getting out of bed safely. The alarms provide nurses with time to react to close-call situations. During a three-year project (2008-2010) ELSI was tested, developed, and implemented as a daily tool for care in Kustaankartano nursing home, Finland[1] (financed by the City of Helsinki). A new implementation model was created, including a peer-to-peer support system. Fall incidents were recorded for two periods, six months before ELSI and three months after the one-year ELSI-usage. From recorded data, the circadian and weekly fall patterns of 44 residents were analyzed. No additional staff was employed or used during the follow-up period. The residents' risks and resources were assessed[2] and results were used to set individual ELSI-settings. In addition different interventions[2] were executed in collaboration with staff and a project focusing on nutrition, documentation, muscular strength, balance, binding reduction, and independent locomotion. **Results & Discussion** The smart floor helped the nurses in targeting their fall prevention efforts to individuals with a high risk of falling. The daily and weekly fall patterns aided the nursing managers to improve the allocation of nursing resources more efficiently (*Table 1*). The most important gain in fall prevention was seen during the night and evening shifts when staffing levels were at their lowest. Falls during the usage of the smart floor turned out to occur especially on Tuesdays and on weekends, and in April. They occurred less often on Wednesdays, Thursdays, and in May. Thursday was the visiting day, and staffing levels were higher than usual. On weekends less staff was present and staff included more often temporary nurses than during weekdays. The nursing labour force is the largest source of expenditure in long-term care. In conclusion, ELSI turned out to be a quality improvement tool for nursing managers as well as to nurses.

References

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Address: MariMils Oy, Vantaa, Finland; *E:* rina.oksanen@marimils.fi

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Table 1. Average monthly diurnal change in falls before and during usage of ELSI smart floor in elderly care wards at Kustaankartano, Helsinki, Finland

Time of the day, H	Number of falls		Difference, %
	Before use	During use	
07:00-14:00	10,0	7.3	-27
14:00-21:00	8,8	7,3	-17
21:00-02:00	4,8	3,0	-38
02:00-07:00	8,6	0,3	-97