

# Dual-Stiffness Flooring: Does it Reduce Fracture Rates Among Older Fallers?

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## BACKGROUND

- Fractures in older adults are associated with significant morbidity and mortality
- Approximately 1 in 20 falls results in a fracture<sup>1, 2</sup>
- Dual-stiffness flooring diminishes the impact of contact with a floor<sup>3-6</sup>
- The TAFETA research team ([www.tafeta.ca](http://www.tafeta.ca)) began studying SmartCells® dual-stiffness flooring in 2005
- The research team aims to determine if SmartCells® dual-stiffness flooring can reduce falls-related injuries amongst older adults
- This project represents the first clinical study that investigates the outcomes of falling on dual-stiffness flooring versus regular flooring

## METHODS

- **LOCATION:** Mountain View Manor, Prescott, Arizona; 116-bed facility for long-term care, rehabilitation and palliative care
- **TIME LINE:** July 1, 2008 to December 31, 2010
- **SUBJECTS:** 60 fallers, 47% female; mean age of 72.4; 167 falls were studied
- **METHODOLOGY:** Analysis of corporate fall incident reports; falls on dual-stiffness floor compared to falls on regular floor
- **DATA ANALYSIS:** Injury rate comparisons conducted using t-test, Chi-Square analysis and logistic regression (i.e., prediction of room type based on number of injuries sustained)

## RESULTS

### FALLER DESCRIPTOR AND DIFFERENCES

Variable	Value %
Percentage of falls by females	78
Mean # of meds taken by fallers	10
Fallers with osteoporosis	24
Fallers with dementia	14
Repeat fallers	16

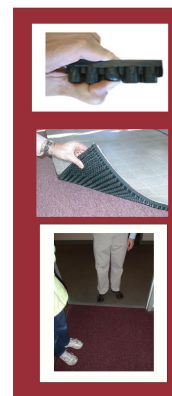
Variable (means)	Reg. Floor	DSF Floor	T Value	2-tailed Sig.
Age	77	70	4.67	.000
# of meds	12	9	6.02	.000



The table in the upper right reveals some significant differences in fallers who occupied rooms with the two flooring types. Thus, the two variables above were entered as covariates in subsequent analyses.

### INJURY PATTERN

Falls & Type of Injury	DSF Floor	Reg. Floor
Number of falls	82 (49%)	85 (51%)
# Falls with injury	44 (53%)	48 (56%)
Redness	2.4%	1.2%
Bruise	2.4%	7.1%
Abrasion	9.8%	15.3%
Cut	13.4%	9.4%
2 or more injuries	1.2%	1.2%
Fracture	0%	2.4%
Other	2.4%	2.4%
% injuries defined as serious	45%	50%
Injury ratio	.53%	.56%



The dual-stiffness flooring yielded a 0% fracture rate versus a 2.4% rate on regular flooring. T-test, Logistic regression and Chi Square analyses, predicting floor type assignment based on number of falls-related injuries sustained — although revealing a trend — were not statistically significant.

## CONCLUSION

- The 2.4% fracture rate on regular flooring is consistent with the literature
- The above finding gives validity to the 0% fracture rate on the dual-stiffness experimental flooring
- A larger trial with more participants is required to provide statistical power
- However, given the trend of reduced fractures on the dual-stiffness flooring, the SmartCells® technology shows promise as a potential tool to help prevent falls-related injuries

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