M. Afifi, B. Parke, M. Al-Hussein. ***Integrated approach for older adult friendly home staircase design.*** *Gerontechnology 2012;11(2):338;* doi:10.4017/gt.2012.11.02.230.00 **Purpose** The concept of designing or modifying home environments plays an important role in maintaining safety for older adults (65 and older). Poor staircase architectural design could contribute to increasing the risk of falling for older adults. The purpose of this research is to evaluate staircase architectural design by investigating the risk of falling associated with staircase elements and aiming to improve the surrounding environment for older adults living independently in their homes. This paper presents research which is built around the following hypotheses: 'Improving the architectural design of staircase could reduce the risk of falling for older adults'. **Method** This research provides an integrated evidence-based assessment that combines all aspects related to staircase architectural design, represented in the following 3 stages. Stage 1 constructs a hierarchy of four elements which represent the architectural design of the staircase as follows: (i) staircase geometrical design; (ii)2) handrail design; (iii) lighting; and (iv) step design. Each element is divided to a number of features; for instance, handrail design, if exists, is divided into five features: (i) handrail height[1]; (ii) handrail cross-section; (iii) handrail surface texture; (iv) handrail extension[2]; and (v) minimum handrail-wall clearance. Each feature is divided into a number of scenarios representing the different architectural design alternatives for that feature: e.g., variation on handrail heights. A rating factor that represents the degree by which the proposed scenario reduces the risk of falling for older adult, is assigned to each scenario. Stage 2 develops a rating system for the analyzing staircase elements and features which present the degree to which each element and its features reduce the risk of falling for older adults. In this stage, a mathematical model is developed to calculate the rating value for different staircase design scenarios. Stage 3 develops a decision tree analysis module called a design assessment tree (DAT) which represents a complete vision for different staircase design scenarios. A case study is presented in order to illustrate the effectiveness of the proposed methodology. **Results & Discussion** The result of the developed rating system is a rating number for different staircase design scenarios that represent the degree by which the proposed staircase architectural design reduces the risk of falling for older adults. Figure 1 illustrates the optimal design scenario for the geometrical design element, which is part of the developed DAT for the staircase assessment procedure. DAT works as a manual for architects to represent the staircase assessment for any proposed design, and to visualize the optimal design scenario comparing to other scenarios in the each branch.

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Affiliation: University of Alberta, Edmonton, Alberta, Canada; *E:* mkafifi@ualberta.ca
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