

# **DISCRIMINATING FALLERS FROM NON-FALLERS AMONG ELDERLY PATIENTS CARED FOR BY THE VISITING NURSE ASSOCIATION**

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**Purpose:** The purpose of the study was to discriminate individuals being cared for by the Visiting Nurse Association (VNA) who are age 65 or older who have experienced a fall within the previous 12 months (Fallers) from individuals being cared for by the Visiting Nurse Association (VNA) who are age 65 or older who have not experienced a fall (Non Fallers) in the previous 12 months.

**Method:** The subject's records were identified from 63,000 VNA patient visits records obtained during the 12 months of 2003. To be included in the target for the study the individual must have received ongoing VNA care during 2003, be age 65 and older and community dwelling. Individuals were excluded from the study if their VNA record indicated they did not ambulate. This sample was then dichotomized into two groups, Fallers and Non-fallers. 146 Fallers were identified from this group and included those individuals in the target who had at least one fall documented on their VNA patient record. These individual Fallers were matched by age, gender, admission date and zip code with individuals in the target who had no documented fall on their VNA record. A random sample of 146 individuals was then drawn from this group of non fallers. This methodology resulted in 146 Fallers and 146 Non-fallers being identified for the study.

Data for the Fallers were extracted from an incident report describing the fall and information collected during the most recent VNA visit with the patient prior to the fall. Data for the Non-fallers were collected from their most recent VNA visit. Data collected during the VNA visit included demographic information as well as information documented on a fall risk screening tool. This tool assessed level of consciousness, history of falls, ambulation capacity, vision status, medication and safety and environmental hazards.

**Findings:** Two data mining techniques were employed to determine the optimal model in discriminating Fallers from Non-fallers including Decision Trees and Decision Rules and Artificial Neural Network. The Decision Tree method generated a model with 70% sensitivity, 70.83% specificity using medication as the most important factor. The Artificial Neural Network method resulted in a model with 85% sensitivity, 38% specificity. The most prominent variables in this model included medication and vision. The other factors that scored in the list were history and safety and environmental hazards.

**Discussion:** Two data mining modeling techniques resulted in models with varying degrees of sensitivity and specificity. Based upon examination of these models the Decision Tree approach produced a superior predictive model. This model employed medication, history, and safety and environmental hazards to discriminate Fallers from Non-Fallers with a high degree of sensitivity and specificity. Clinicians may evaluate these characteristics of their VNA patients when attempting to identify patients who have a high likelihood of falling in the future.

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