**Predicting Mobility Assistive Device Needs in Elders Using EHR and Healthcare Utilization Data**
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**Purpose** The rapid growth of the aging population has markedly increased the demand for mobility assistive devices (MADs) [1], while conventional labor-intensive assessments have become increasingly unsustainable under workforce shortages [1]. This study aimed to develop a machine learning–based prediction model using electronic health records (EHR) and healthcare utilization data to support a clinical decision support system (CDSS) for the early identification of MAD needs in older adults and to facilitate proactive aging-in-place interventions. **Method** A retrospective analysis was conducted using real-world data from Taipei Veterans General Hospital and the Veterans Affairs Council (2016–2024), including 5,986 adults aged ≥65 (Figure 1). SMOTEENN was applied to address class imbalance [2]. Seven machine-learning models were evaluated using 5-fold cross-validation, and SHAP was used for model interpretability [3]. **Results and Discussion** Gradient boosting models outperformed traditional classifiers, with LightGBM achieving the best performance (AUROC = 0.959, accuracy = 91.0%, specificity = 95.7%). SHAP analysis identified ICD-10 diagnoses as the most important predictors, followed by residential location and medical specialty (Figure 2). These findings demonstrate the real-world feasibility of integrating MAD prediction into a hospital CDSS to support timely, accessible, and resource-efficient aging-in-place care while reducing caregiver burden.

**References**

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**Keywords:** Mobility Assistive Devices; Electronic Health Records; Clinical Decision Support System
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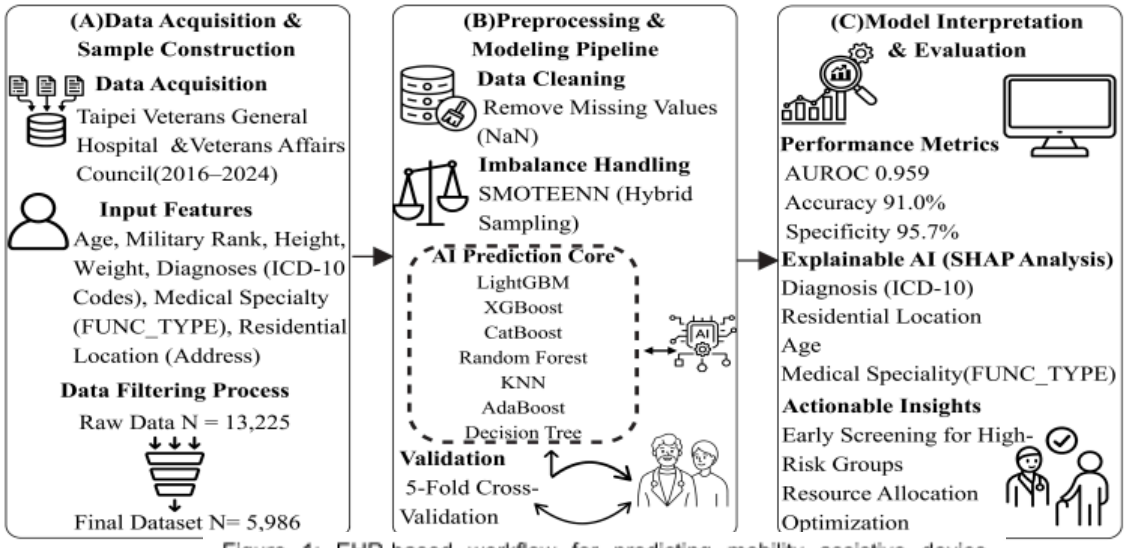


Figure 1: EHR-based workflow for predicting mobility assistive device needs.

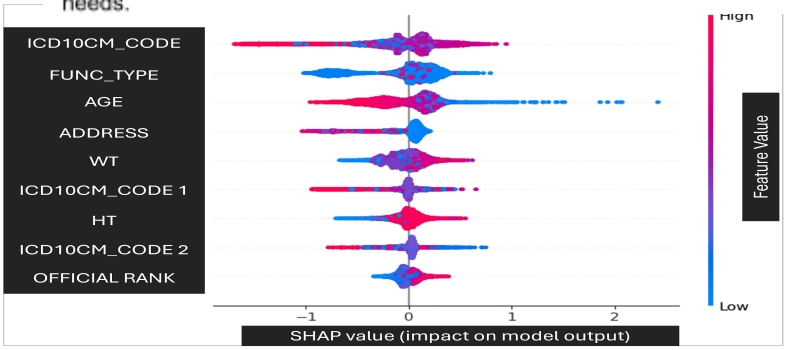


Figure 2: SHAP feature importance for mobility assistive device prediction.