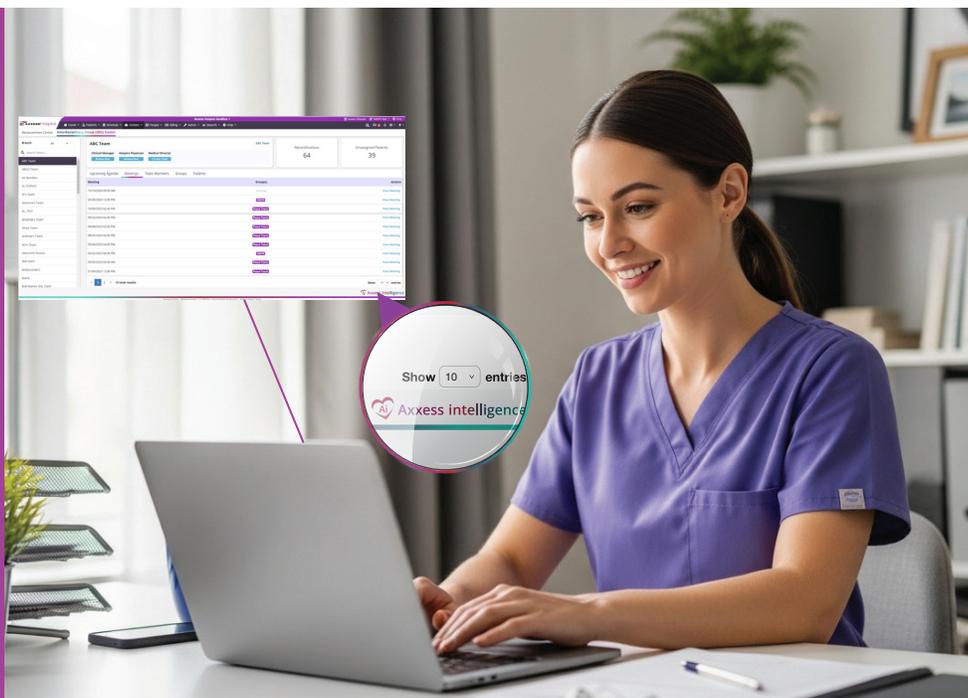


# Predicting End-of-Life Risk in Hospice Care Using Axxess intelligence<sup>®</sup>





## Predicting End-of-Life Risk in Hospice Care Using Axxess intelligence®

Accurately identifying when a patient is entering the final seven days of life is essential for delivering the right level of hospice support. This period requires heightened symptom management and intensive family communication. It also aligns with the Medicare Service Intensity Add-On (SIA), which reimburses providers for increased RN and social work services in the last week of life.

A reliable, data-driven indicator of imminent end of life helps hospice organizations allocate staff more efficiently, prevent avoidable crises, and ensure families receive timely guidance.

To better understand how organizations can identify this critical period earlier and more reliably, Axxess analyzed real-world hospice data to see what indicators consistently signal the final week of life.

## What We Did

Axxess analyzed all daily patient records from skilled nursing and related visits documented in Axxess Hospice since January 1, 2025. Each day's record was linked to the patient's actual date of death to determine whether the visit occurred within the final seven days of life.

To prepare the data, we converted every EMR question and answer into something the model could learn from. We also removed duplicate or low-value information, similar to cleaning up a cluttered chart so the most meaningful details stand out. This process reduced roughly 1,500 data points down to about 700 that truly helped predict when a patient was nearing the final week of life.

To build the prediction tool, we used a modeling approach that automatically selects the most important factors while ignoring those that add noise or confusion.

It also tests itself repeatedly on different samples of data to ensure the predictions hold up across many types of patients and situations. Once the model was built, we began using it every week on all active hospice patients who had a recent visit. In a typical week, approximately 5% of the census dies within seven days, enabling us to continually check how well the model is performing.

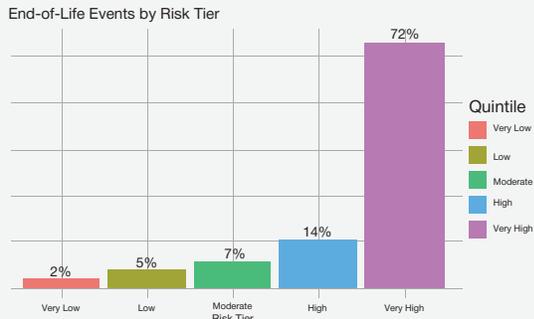
The dataset used to train and validate the model includes all hospice daily visit records documented since January 1, 2025. The model refreshes nightly using the most recent day's data, and the performance results presented in this white paper reflect a prediction cycle generated in February 2026, with ongoing accuracy monitoring.



## What We Found

- The model accurately isolates the highest-risk patients. From January 30 to February 6, 2026, most recorded deaths occurred among patients in the highest-risk tier: approximately 70% of end-of-life events occurred in the top 20% risk group, compared to only 30% of events across the remaining 80%.

*For illustration, we highlight one prediction cycle from January 30 to February 6, 2026. While sample sizes are masked to protect proprietary census information, these results represent a typical weekly distribution of risk and outcomes across our hospice population.*



- The highest-risk tier captured the majority of patients who were truly in their last week of life. Just 9% of the census accounted for 54% of all seven-day mortality, giving teams a clear group to prioritize.

- High-risk patients were six times more likely to be within seven days of end of life. Among flagged patients, 38% died within seven days, compared to 6% in the overall population. This indicates that a hospice manager using this predictor would be six times more likely to identify an end-of-life event than through random selection alone.



- The model demonstrated strong performance in validation, achieving 91% accuracy. Additionally, its ROC-AUC score of 0.84 reflects reliable predictive capability across the full range of possible thresholds and aligns with widely accepted standards for real-world health data models.

### About ROC-AUC

*Predicting end-of-life risk requires choosing a cutoff score above which a patient is predicted to be within seven days of death. Because different hospices may prefer different cutoffs, the ROC-AUC measures how well the model performs across all possible thresholds. A score of 0.84 represents strong, clinically useful performance for real-world health data models.*

## Why Our Model Is Different

Axxess intelligence® matches and, in many cases, exceeds the performance of academic end-of-life prediction models published in peer-reviewed research. Unlike models that require restrictive clinical criteria or are tested only in retrospective studies, Axxess generates real-time predictions across all hospice patients, regardless of diagnosis or condition complexity. Integrated directly into the Axxess ecosystem, this model pairs real-time alerts with retrospective analytics and standardized EMR data, giving clinicians a complete picture of each patient's trajectory and enabling earlier, more reliable identification of the final week of life.

## Why It Matters

Better visibility into impending end of life can transform clinical operations, enabling proactive triage, more efficient staffing, improved symptom management, stronger family communication, and appropriate SIA utilization. As Axxess continues to enhance the model with improved EMR standardization and evolving data structures, predictive capabilities will continue to expand and strengthen across the Axxess Hospice and Axxess Business Intelligence platforms.



## Author



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Phil Gigliotti, PhD, is a Senior Data Scientist at Axxess, where he leads the development of predictive analytics capabilities for the Axxess Business Intelligence platform. He is an expert in Medicare value-based payment and statistical analysis of high-stakes clinical outcomes. Dr. Gigliotti brings five years of experience in the healthcare analytics industry, including his prior role as a Researcher at Mathematica. His mission is to deliver high-impact insights that improve decision-making and transform outcomes.