

Predicting Symptom Exacerbation in Hospice Care Using Axxess intelligence®





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Hospice providers operate in a highly regulated environment where timely and accurate symptom management is critical to both patient care and compliance.

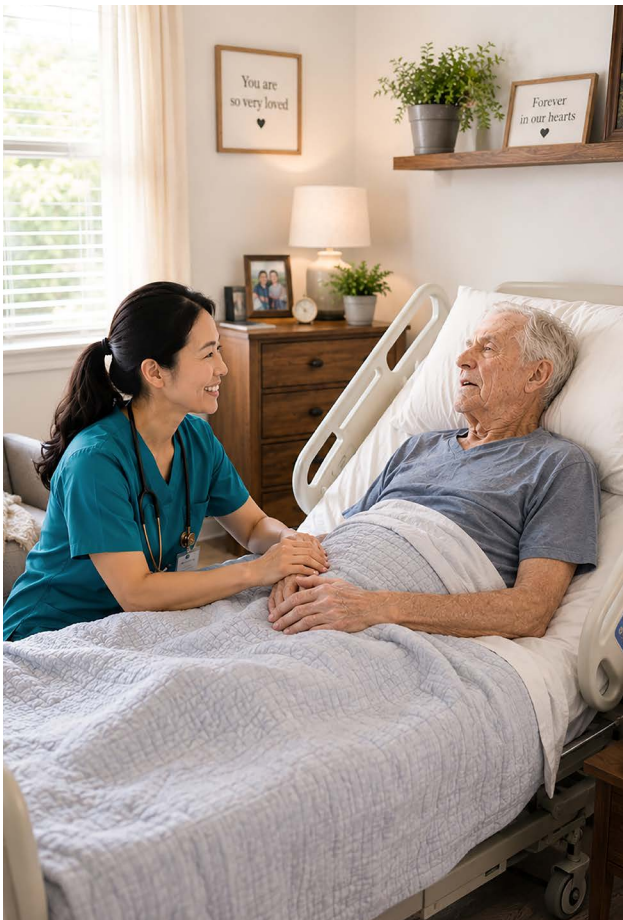
With the introduction of **Hospice Outcomes and Patient Evaluation (HOPE)** requirements, clinicians must assess and document eight key symptoms:

- Pain
- Shortness of breath
- Anxiety
- Nausea
- Vomiting
- Diarrhea
- Constipation
- Agitation

Patients reporting **moderate or severe symptoms require follow-up visits**, creating additional clinical and operational demands.

Identifying which patients are most likely to experience symptom exacerbation is essential to:

- Prioritize care effectively
- Optimize clinician resources
- Maintain compliance with regulatory requirements



What We Did

To help providers anticipate patient needs more effectively, Axxess developed a predictive model to identify patients at high risk for symptom exacerbation within the next seven days.

The model leverages a high-dimensional dataset derived from Axxess Hospice, incorporating hundreds of patient-specific risk factors. By analyzing historical patterns of symptom exacerbation, the model generates a forward-looking risk score that can be applied to current patient populations.

Predictions are updated nightly and evaluated across rolling seven-day windows using three key metrics:

- Recall (how many actual events are detected)
- Precision (how many predictions are correct)
- Lift (how much better the model performs than random selection)

What We Found

Results were aggregated across 31 seven-day prediction windows from May 1 to May 31, 2026.

Despite low prevalence of symptom exacerbation, the model demonstrated strong predictive performance:

- **42% recall:** The model identified about **4 out of every 10 patients** who went on to experience a symptom flare.
- **30% precision:** About **1 in 3 patients** flagged as high-risk actually experienced a flare.

*To put that into perspective: Without the model, clinicians are essentially searching for a needle in a haystack, as only about 1 in 38 patients will have a flare in any given week. The model narrows that search dramatically, focusing attention on a small group where **the odds improve to 1 in 3.***

- **11.54x lift:** By concentrating risk into a small subset of patients, the model increases the likelihood of identifying a true case of symptom exacerbation from roughly 1 in 38 patients to 1 in 3, **an improvement of more than 11 times over baseline.**

What This Means

The model helps clinicians focus on a group of patients who are much more likely to experience symptom exacerbation, making it easier to intervene earlier and more effectively.

42%
Recall

4 out of every 10 patients

30%
Precision

1 in 3 patients

11.54x
Lift

an improvement of more than
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Why Our Model Is Different

Axxess intelligence introduces a key innovation beyond predictive accuracy: transparent performance reporting.

Clinicians can view recall, precision, and lift directly within the prediction dashboard, providing visibility into the reliability and limitations of the model.

This approach:

- Quantifies uncertainty in real time
- Builds trust in predictive outputs
- Enables clinicians to make informed decisions with full context

Rather than relying on “black box” predictions, providers gain actionable insights supported by clear, measurable performance data.

This transparency framework is being extended across all Axxess predictive dashboards.

Why It Matters

Symptom exacerbation in hospice care is both clinically significant and operationally complex. Without predictive insight, providers must rely on reactive workflows and broad monitoring strategies.

By identifying a small subset of high-risk patients (less than 4% of the population) this model enables:

- More proactive clinical intervention
- Better prioritization of follow-up visits
- More efficient allocation of limited resources
- Stronger alignment with HOPE compliance requirements

Even modest improvements in early identification can have a profound impact.

Axxess intelligence enables hospice providers to shift from reactive care to targeted, data-driven intervention, improving outcomes while optimizing operations.



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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.



ABOUT AXXESS

Axxess is the leading global technology platform transforming how care is delivered in the home. Trusted by more than 10,000 organizations worldwide, its robust ecosystem empowers healthcare professionals to deliver exceptional care to more than 10 million patients. As a true partner committed to its clients' success, Axxess listens, adapts and innovates alongside them to meet today's challenges and prepare them for tomorrow's opportunities. Recognized nationally as a "Best Place to Work," Axxess fosters a collaborative culture that fuels innovation and excellence.