Executive Report: An Action Plan to Reduce 30-Day Diabetic Readmissions

To: MISM 6200 Stakeholders
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Subject: A Data-Driven Strategy to Reduce 30-Day Diabetic Patient Readmissions

1. The $100M Opportunity

Our analysis of ten years of clinical data (101,766 patient records) identified a critical, costly problem and a clear, data-driven solution.

- **The Problem: 11.2%** of diabetic patients are readmitted within 30 days of discharge. With an estimated cost of **$10,000 - $15,000 per incident**, this represents a significant, recurring financial drain and a major gap in patient care.
- **The Opportunity:** We can move from a reactive to a *proactive* care model. By identifying high-risk patients *before* they are discharged, we can deploy targeted, low-cost interventions to improve outcomes and generate substantial savings.

2. The Solution: A Predictive Risk Model

We have developed a predictive risk model, built by testing multiple machine learning methods (including Logistic Regression, Random Forest, and XGBoost) to ensure the highest accuracy.

This model goes beyond simple prediction to identify the *root causes* of readmission. At the point of discharge, it generates a "Readmission Risk Score" for any diabetic patient, allowing clinical staff to instantly segment patients into low-risk and high-risk groups.

3. Key Actionable Insights

Our analysis uncovered several counter-intuitive findings that challenge current assumptions and provide a clear focus for intervention.

- **Finding 1: The "Short Stay Paradox."** Patients with 1-day stays have the *lowest* readmission risk (8.2%). The risk significantly increases for patients staying 2-7 days, peaking at 13.4% for 3-day stays. This suggests our current discharge protocols for short-term patients may be premature and require immediate review.
- **Finding 2: Prior History is the Key Predictor.** A patient's history is the most powerful predictor. The number of inpatient admissions, emergency room visits, and outpatient visits in the preceding year are the strongest indicators of a future readmission.

4. Critical Caveat & Path Forward

The analytical model is highly successful, but it was built using a 1999-2008 dataset. Clinical practices have evolved significantly since then. Therefore, the immediate next step is not full deployment, but validation.

We recommend the following three-phase action plan:

1. **VALIDATE:** Test the model's logic and predictors against current 2024-2025 hospital data. This will confirm its accuracy and relevance before any clinical integration.
2. **PILOT:** Deploy the validated model in a controlled A/B test. One department will use the model's "Risk Score" to guide interventions (e.g., follow-up calls, home-health referrals) for high-risk patients, while a control group does not. This will precisely quantify the model's real-world impact on reducing readmission rates.
3. **INTEGRATE:** Following a successful pilot, integrate the risk-scoring tool directly into the hospital's Electronic Health Record (EHR) system, providing a real-time "risk flag" to all clinical staff at the point of discharge.