THE PRICE OF POOR CONTROL

THE CORRELATION BETWEEN GLYCEMIC CONTROL AND WOUND HEALING OUTCOMES

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ABSTRACT

Throughout my time at Memorial Hermann Southwest, what stood out to me was how often a patient's glycemic control seemed to influence their healing progress. Some wounds that appeared minor took unexpectedly long to close, whilst other wounds that seemed more severe resolved quickly. This study investigated whether glycemic control—as measured by HbA1c levels—is associated with wound healing outcomes amongst patients seen at the hospital's Wound Care Clinic.

All patients who visited the Wound Care Clinic with an HbA1c level on file from January 2025 to present were included in the study and classified into three groups: non-diabetic, pre-diabetic, and diabetic. Among confirmed-healed patients, diabetic patients required significantly more time to heal (averaging 124.6 days) compared to non-diabetic patients (averaging 89.2 days). A significance test comparing healing time across all three groups was conducted and suggested that glycemic category may influence wound healing trajectory, a finding that speaks to something larger than the data alone. The goal of this study isn't just to understand the numbers, but to stress the importance of glycemic control, and to illustrate that actively managing diabetes has measurable consequences for how the body heals.

INTRODUCTION

Diabetes mellitus is one of the most prevalent chronic conditions in the United States, affecting over 40 million Americans according to the American Diabetes Association. The disease affects the body's ability to heal wounds through several interconnected mechanisms: elevated blood glucose impairs neutrophil function, reduces collagen synthesis, and restricts the formation of new blood vessels that are necessary for tissue repair. HbA1c, which reflects average blood glucose levels over approximately three months, serves as the clinical standard for classifying glycemic control.

Research has consistently linked poor glycemic control to worse wound healing outcomes. Studies have found that diabetic patients are significantly more likely to develop chronic wounds, experience wound infections, and require amputation compared to non-diabetic patients. Elevated HbA1c specifically has been associated with delayed wound closure and increased complication rates in clinical settings.

RESULTS/FINDINGS

Figure 1

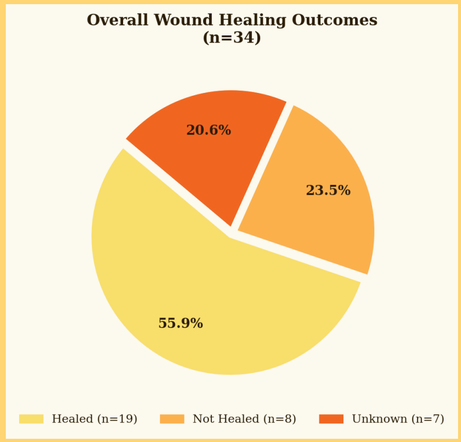

Figure 2

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METHODOLOGY

This study used a retrospective observational design, reviewing quantitative chart data from all patients who attended the Memorial Hermann Southwest Wound Care Clinic with an HbA1c level on file from January 2025 to present, totaling 34 patients. Each patient was classified into one of three glycemic categories using ADA standards: non-diabetic (< 5.7%, n=15), pre-diabetic (5.7–6.4%, n=9), or diabetic (≥ 6.5%, n=10).

Outcome variables included confirmed healing status (healed, not healed, or unknown). For healed patients, days to confirmed healing were measured. For unhealed patients, days elapsed between first and last wound care visit were measured. For patients whose outcome was unknown or unresolved, clinician-assigned healing potential (poor, fair, or excellent) was recorded. Age and gender were recorded to gain a broader understanding of the patient population, and initial wound surface area and depth were documented to contextualize the severity of each case.

DISCUSSION

The data revealed a statistically significant difference in healing time across glycemic categories ($p = 0.04$), with diabetic patients taking the longest to heal on average. An unexpected result was that pre-diabetic patients healed fastest on average (42 days), compared to both non-diabetic (89.2 days) and diabetic (124.6 days) patients. This finding is preliminary given the small sample size and warrants further investigation, but it adds an unexpected layer of nuance to the relationship between glycemic control and healing.

There are a few limitations to this study: the sample size is small (n=34), seven patients had unknown outcomes, and the study drew from a single clinic's patient records and therefore may not be representative of wound care patients in other settings or regions. But despite these limitations, the findings underscore the importance of glycemic control and early screening. Knowing your HbA1c level matters—not just for managing diabetes, but for understanding how the body responds when healing is needed. The results suggest that staying informed about your glycemic health and actively managing it could have measurable consequences for recovery.