

## Hemoglobin A1c Testing in an Emergency Department

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### Abstract

#### Background:

Emergency department (ED) visits for hyperglycemia are common and costly. Enhanced strategies for recognizing and managing patients with diabetes in the ED are needed. Hemoglobin A1c (A1C) testing is typically used to assess level of glycemic control in the 2–3 months preceding an office visit. In this article, we report on potential roles for point-of-care (POC) A1C testing in the ED for patients presenting with uncontrolled hyperglycemia.

#### Methods:

We enrolled patients presenting to an urban tertiary care hospital ED with blood glucose (BG)  $\geq 200$  mg/dl who were otherwise stable for discharge ( $n = 86$ ) in a prospective, nonrandomized pilot study. Antihyperglycemic medication management, survival-skills diabetes self-management education, and health system navigation were provided. Followup visits took place at 24–72 hours and at 2 and 4 weeks. Point-of-care A1C testing was performed at baseline and at 2 weeks. Baseline A1C results were used by the ED physician and the educator to inform the patient of likely preadmission glycemic classification, and the potential role that the (diabetes mellitus) DM medication regimen assigned in the ED had in enabling overall progress in glycemic control at 2 weeks post-ED initiation of treatment.

#### Results:

At baseline, 50% of POC A1C values were  $>13\%$ . Mean BG fell from  $356 \pm 110$  mg/dl to  $183 \pm 103$  mg/dl at 4 weeks (average decrease of 173.5 g/dl,  $p < 0.001$ ). Mean A1C fell by 0.4%, from  $12.0 \pm 1.5\%$  to  $11.6 \pm 1.6\%$  at 2 weeks,  $p = 0.048$ . There were zero instances of day 1 hypoglycemia and overall hypoglycemia rates were low (1.3%).

#### Conclusions:

Point-of-care A1C testing in the ED helped inform both the provider and the patient of likely prior glycemic status, including unrecognized or uncontrolled type 2 diabetes, and allowed emphasis of the importance of timely diabetes self-management education and medication management in preventing acute and chronic complications. Followup POC A1C testing at 2 weeks was used to confirm early improvement in glycemic control postintervention.

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**Abbreviations:** (A1C) glycosylated hemoglobin, (ADA) American Diabetes Association, (BG) blood glucose, (DM) diabetes mellitus, (DSME) diabetes self-management education, (eAG) estimated average glucose, (ED) emergency department, (POC) point of care, (T2DM) type 2 diabetes mellitus

**Keywords:** A1C, diagnosis, emergency department, hyperglycemia, type 2 diabetes

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