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### Glucose Control Lowers the Risk of Wound Infection in Diabetics After Open Heart Operations

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#### Abstract

*Background.* Elevated blood glucose levels in the postoperative period are associated with an increased risk of deep wound infection in diabetic individuals undergoing open heart operations at Providence St. Vincent Hospital.

*Methods.* Of 8,910 patients who underwent cardiac operations between 1987 and 1993, 1,585 (18%) were diabetic. The rate of deep sternal wound infections in diabetic patients was 1.7%, versus 0.4% for nondiabetics. Nine hundred ninety patients had their operation before implementation of the protocol and 595 after implementation. Charts

of all diabetic patients were reviewed. Mean blood glucose levels were calculated from documented results of finger-stick glucometer testing.

*Results.* Thirty-three diabetic patients suffered 35 deep wound infections: 27 sternal (1.7%) and eight at the donor site (0.5%). Infected diabetic patients had a higher mean blood glucose level through the first 2 postoperative days than noninfected patients ( $208 \pm 7.1$  versus  $190 \pm 0.8$  mg/dL;  $p < 0.003$ ) and had a greater body mass index ( $31.5 \pm 1.4$  versus  $28.6 \pm 0.1$  kg/m<sup>2</sup>;  $p < 0.05$ ). Multivariable logistic regression showed that mean blood glucose level for the first 2 days ( $p = 0.002$ ), obesity ( $p < 0.002$ ), and use of the internal mammary artery ( $p < 0.02$ ) were all independent predictors of deep wound infection. Institution of a protocol of postoperative continuous intravenous insulin to maintain blood glucose level less than 200 mg/dL was begun in September 1991. This protocol resulted in a decrease in blood glucose levels for the first 2 postoperative days and a concomitant decrease in the proportion of patients with deep wound infections, from 2.4% (24/990) to 1.5% (9/595) ( $p < 0.02$ ).

*Conclusions.* The incidence of deep wound infection in diabetic patients was reduced after implementation of a protocol to maintain mean blood glucose level less than 200 mg/dL in the immediate postoperative period.

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## Keywords

Blood glucose; diabetes; hyperglycemia; infection; sternal wound infection.

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