

# IMPACT OF BLOOD GLUCOSE MONITORING (BGM) IN THE CARDIAC SURGERY POPULATION PREVENTING SURGICAL SITE INFECTIONS

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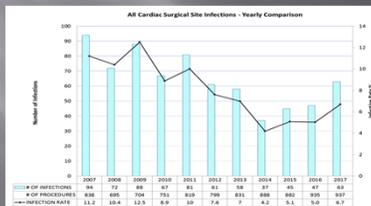
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## Issue (1)

2014-2017  
SSI rate in Cardiac surgery increased from 5.1% (2014) to 6.7% (2017)



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### Issue (2)

Surveillance data indicated that 40-71% of the patients who developed a surgical site infection (SSI) had a blood glucose level greater than 10mmol/L in the 72hrs perioperative period

Year	% blood glucose >10mmol/L
2014	46
2015	71
2016	53
2017	40

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### Issue (3)

Despite bundle initiatives to reduce SSI and yearly recommendations to control blood glucose in the peri-operative phase.

Pre-operative	Pre-op shower : 2%CHG wash cloth
	Hair removal with clippers
Intra-operative	Antibiotic prophylaxis
	Skin antiseptis 2% CHG with 70% alcohol
Post-operative	Prompt drain removal
	Removal of initial dsg
Recommendations given yearly from 2014	Control blood glucose to levels<10mmol/L in the peri-operative phase

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### Mini Project in 2017

- ❑ Real time glucose monitoring of all Cardiac surgery patients for 72 hours
- ❑ Weekly feedback to the Surgeons




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## Project

- BGM on all patients undergoing cardiac surgery for 72hrs peri-operatively
- A multi-disciplinary team was formed:
  - Intensivist, Cardiac surgeon, endocrinologist, anesthesia, clinical educators, nursing, Infection Control and Pharmacy




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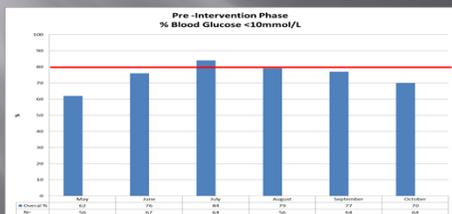
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## Objective

Maintain a blood glucose level below 10mmol/L of the Cardiac surgery patients 80% of the time in the perioperative period (up to 72hrs post-op)




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## Findings (1)

- Patients who did not meet the target of maintaining blood glucose <10mmol/L 70% of the time are Diabetic

	Off target	On target	P-value
Number	17 (18%)	75 (82%)	=
Age (mean ± SD)	66.8 ± 9.4	66.1 ± 11.6	NS
Sex	16 (94%)	71 (95%)	0.100
BMI (mean ± SD)	30.5 ± 6.5 (data available for n = 15)	27.2 ± 4.3 (data available for n = 70)	0.078
Diabetic	12 (71%)	19 (25%)	0.0001*
HbA1c of patients with DM	6.8 ± 0.9 (data available for n = 7)	6.6 ± 1.0 (data available for n = 9)	NS
Pre-operative Medicine consult	3 (18%)	16 (21%)	NS

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## Proposed Solutions

Causes of suboptimal glycemic control	Proposed solutions
Pre-existing diabetes	Consult Endocrinology
Clinical inertia: Blood glucose target of 7-10 mmol/L too high.	Tighten blood glucose targets from 7-10 to 6-8 mmol/L with use of a modified insulin protocol
Minimal use of IV insulin intra-operatively	Encourage more routine use of insulin infusions intra-operatively
Discontinuation of IV insulin during transfers from OR to ICU and from ICU to SDU	Continue IV insulin infusion during transfers intra-operatively
Prescription of SC insulin correction scale after discontinuation of IV insulin	Consult Endocrinology for assistance with appropriate transition off IV insulin, especially if infusion rate >2units/hr

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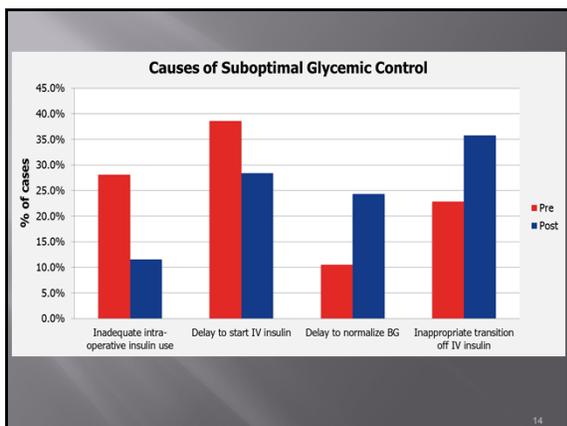
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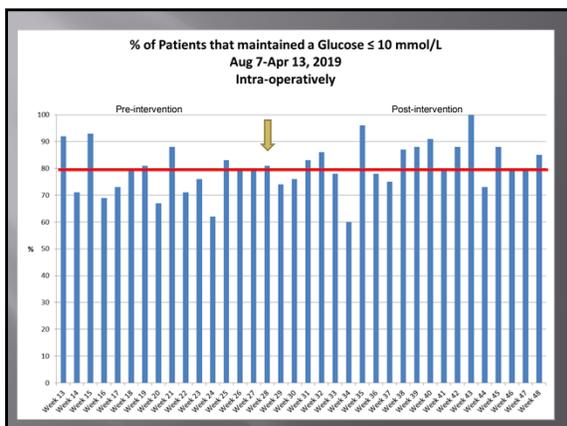
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### Conclusion: Key findings

- ❑ Overwhelming proportion of patients not meeting glycemic control have preoperative diagnosis of DM
- ❑ 4 main postulated reasons for suboptimal glycemic control:
  - BG off target prior to leaving OR
  - IV insulin not initiated within 2 hours of arrival to ICU
  - failure to normalize BG within 9 hours of initiation of IV insulin
  - inappropriate transition off IV to SC insulin
- ❑ Overall improved BG control intra-op with more use of IV insulin in OR

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### Lessons learned

- ❑ Detailed process mapping helped identify reasons for poor BGM in cardiac surgery patients and corrections at each of the identified steps helped to reduce SSI

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Thank you



AT THE HEART OF THE MATTER

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