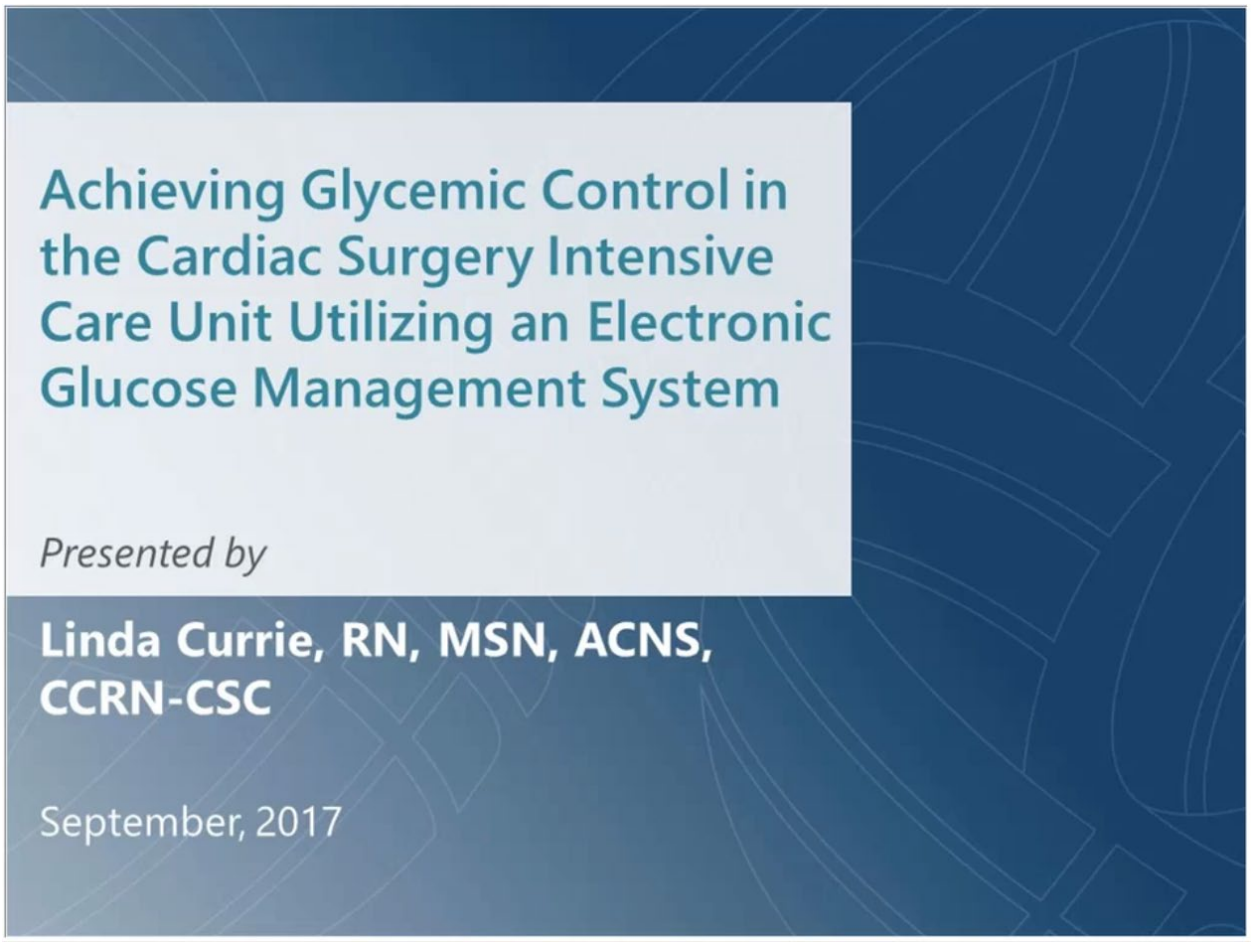
Achieving Glycemic Control in the Cardiac Surgery Intensive Care Unit Utilizing an Electronic Glucose Management System

Linda Currie, RN, MS, ACHN, CCRN-CSC

Virginia Commonwealth University Health System

September 2017



Our Paper Protocol Challenges

- Linear approach to patient management resulting in:
  - High doses of insulin to achieve BG goal range
  - Prolonged time to glucose control
  - Roller coaster BG control
- Ineffective in hyperglycemia management
- Ineffective in preventing hypoglycemia
- No incremental dosing

Paper vs Endotool

Paper Protocol

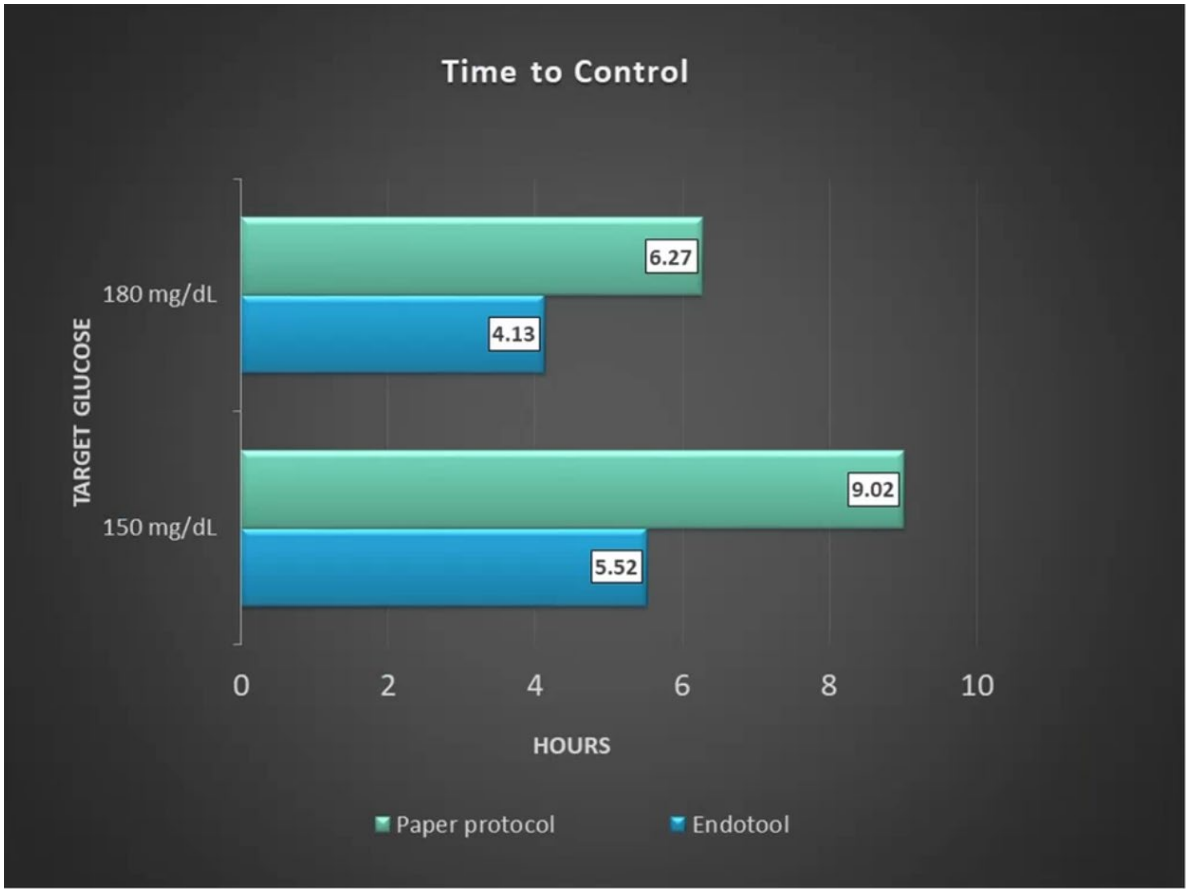
- Data Analysis Time Frame: **1/1/2011-9/29/2013**
  - **33** months
  - **698** patient visits
  - **110,174** readings

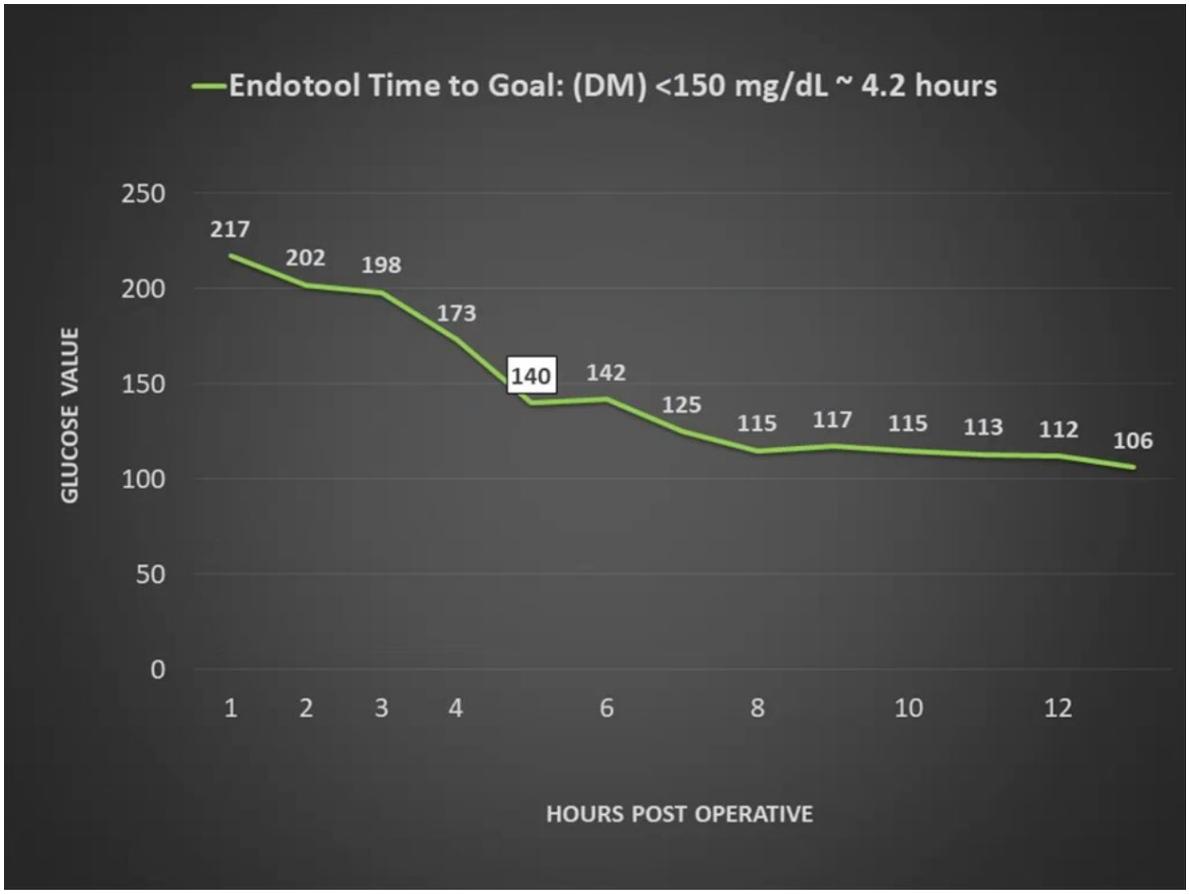
Endotool

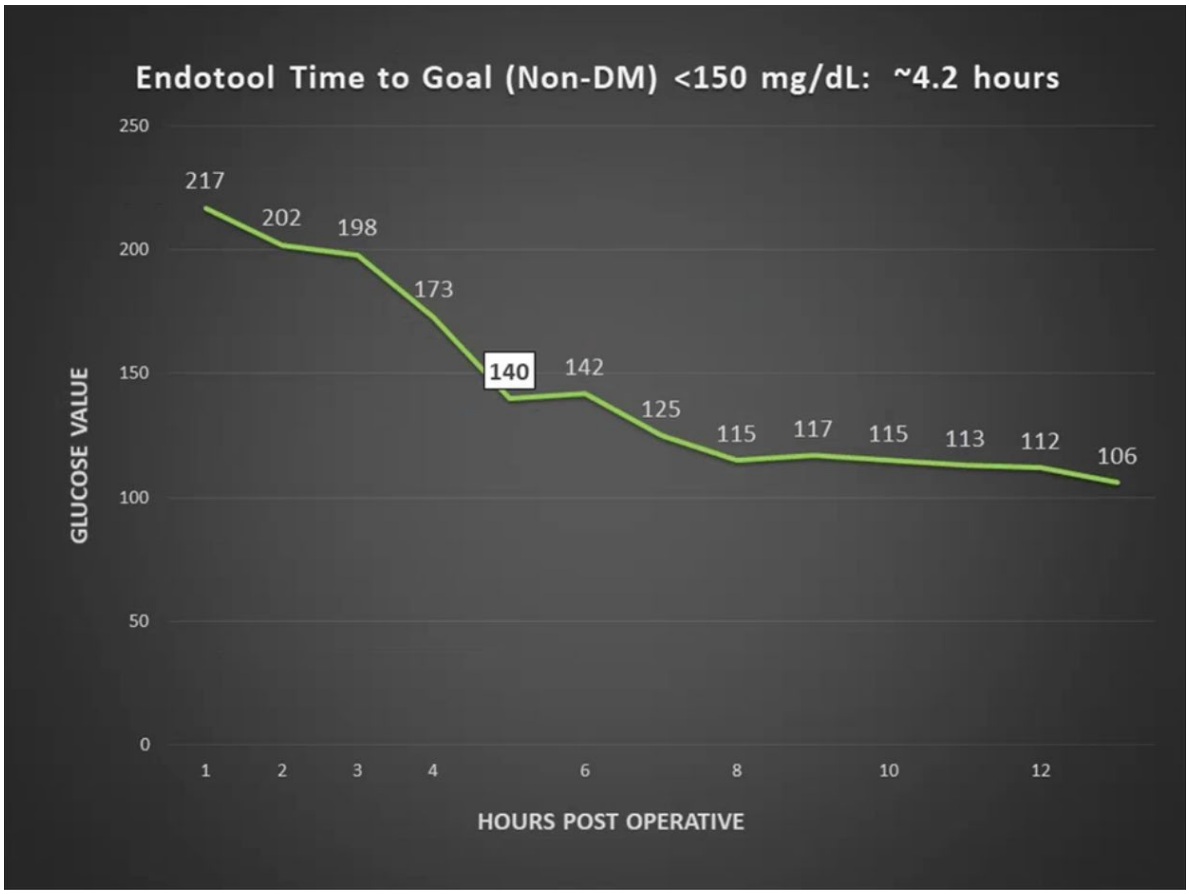
- Data Analysis Time Frame: **9/30/2013-12/9/2016**
  - **38** months
  - **2,169** patient visits
  - **72,451** readings

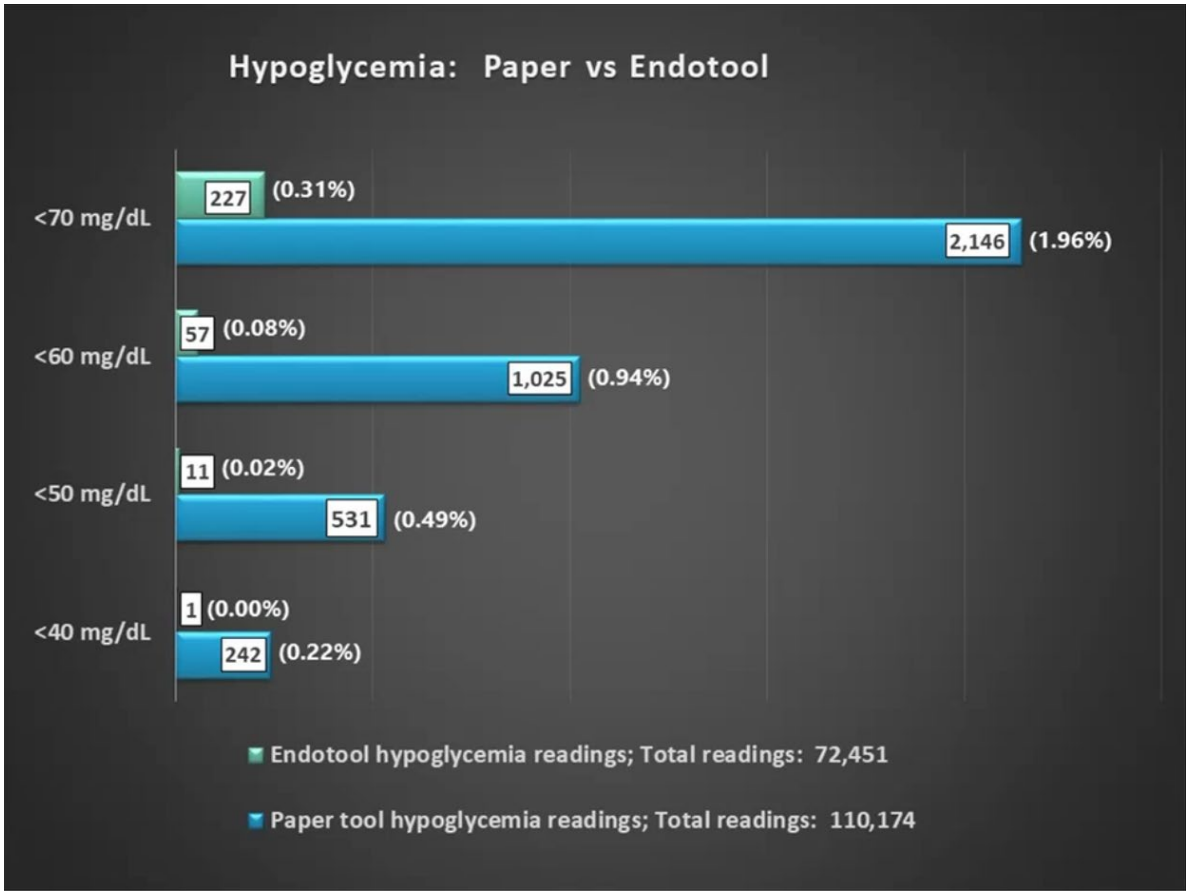
Implementing an EGMS at the unit level

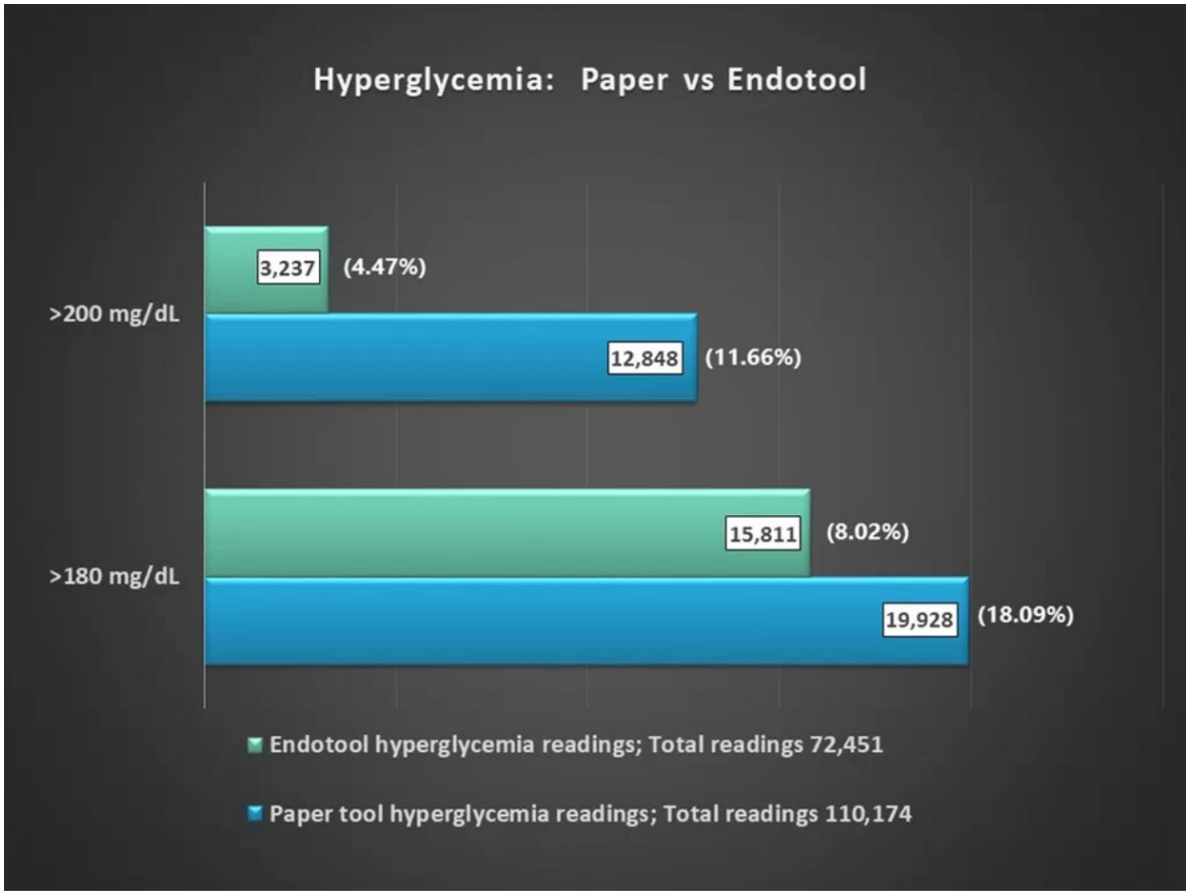
- Location: CSICU
- Number of patient beds: 14
- Number of staff: ~65
- Which patients:
  - All patients on Insulin infusion:
    1. Post op cardiac surgery patients (initiated in OR or pre-operatively) x 48 hours minimum post op.
    2. All thoracic, vascular, ECMO (non-surgical) and Esophagectomy patients with 2 consecutive BG> 180 mg/dL.

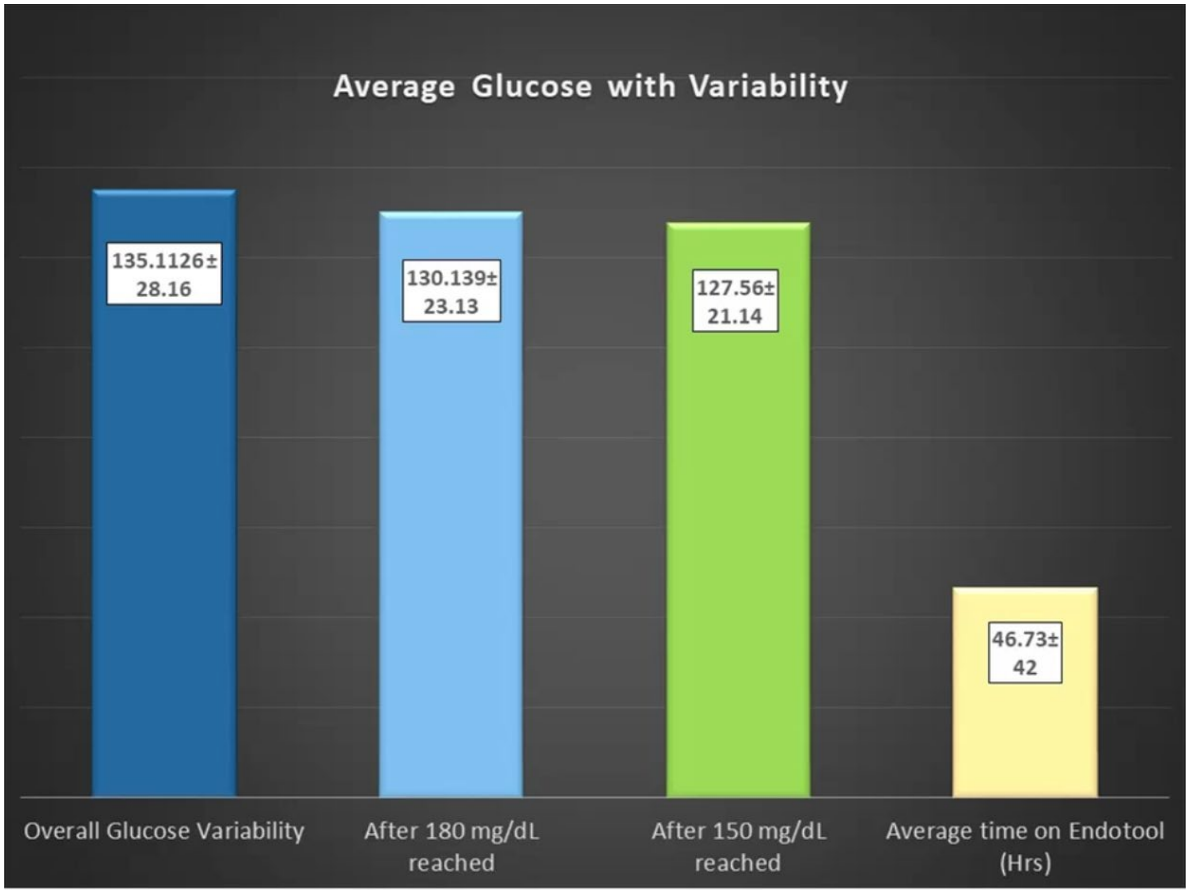



Endotool Time to Goal: (DM) <150 mg/dL ~ 4.2 hours
GLUCOSE VALUE
250
200
150
100
50
0
217
202
198
173
140
142
125
115
117
115
113
112
106
1
2
3
4
6
8
10
12
HOURS POST OPERATIVE


Endotool Time to Goal (Non-DM) <150 mg/dL: ~4.2 hours
GLUCOSE VALUE
250
200
150
100
50
0
217
202
198
173
140
142
125
115
117
115
113
112
106
1
2
3
4
6
8
10
12
HOURS POST OPERATIVE


Hypoglycemia: Paper vs Endotool
<70 mg/dL
227
(0.31%)
2,146
(1.96%)
<60 mg/dL
57
(0.08%)
1,025
(0.94%)
<50 mg/dL
11
(0.02%)
531
(0.49%)
<40 mg/dL
1
(0.00%)
242
(0.22%)
Endotool hypoglycemia readings; Total readings: 72,451
Paper tool hypoglycemia readings; Total readings: 110,174


Hyperglycemia: Paper vs Endotool
>200 mg/dL
3,237
(4.47%)
12,848
(11.66%)
>180 mg/dL
15,811
(8.02%)
19,928
(18.09%)
Endotool hyperglycemia readings; Total readings 72,451
Paper tool hyperglycemia readings; Total readings 110,174


Average Glucose with Variability
135.1126± 28.16
130.139± 23.13
127.56± 21.14
46.73± 42
Overall Glucose Variability
After 180 mg/dL reached
After 150 mg/dL reached
Average time on Endotool (Hrs)