The Portland Diabetic Project: 1987 - 2005

Goal:
Eliminate the “Unfair Disadvantage”
The Portland Diabetic Project

The “Unfair Disadvantage”

Lifetime Risk of Coronary Artery Disease:

Diabetic Population: 54%

- No CAD: 46%
- CAD: 54%

Non-DM Population: 6%

- No CAD: 94%
- CAD: 6%
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The “Unfair Disadvantage”

Patients with Diabetes Mellitus:
- 6.2% of US Population (ADA)
- 29% of cardiac surgery population (STS):

![Pie chart showing DM and Non-DM patients](image_url)
The “Unfair Disadvantage”

4x Higher complication rates after cardiac surgery:
Infection -- Mediastinitis 3.5% (STS)
The "Unfair Disadvantage"

Patients with Diabetes Mellitus:

- 2x Higher post-operative mortality (STS - CABG):

<table>
<thead>
<tr>
<th>Mortality</th>
<th>DM</th>
<th>non-DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0%</td>
<td>4.5%</td>
<td></td>
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<tr>
<td>4.0%</td>
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<tr>
<td>3.0%</td>
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<td>2.0%</td>
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<tr>
<td>1.0%</td>
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<td></td>
</tr>
<tr>
<td>0.0%</td>
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DM: Diabetes Mellitus
non-DM: Non-Diabetes Mellitus
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The “Unfair Disadvantage”

Patients with Diabetes Mellitus:

- Longer lengths of stay after cardiac surgery:

<table>
<thead>
<tr>
<th>Days</th>
<th>non-DM</th>
<th>DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>7.5</td>
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</tbody>
</table>

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CABG Patients with Diabetes -- NY

% Diabetes vs. Year


NYDOH Cardiac Surgery Registry
The Ultimate Disadvantage: Post-CABG Survival

Survival %

Years Post-CABG

DM vs non-DM

P < 0.001

0 5 10 15

10983 5610 2213 260 3762 1477 419 26

0 100

20 40 60 80 100
The Portland Diabetic Project: General Hypothesis

Normalization of peri-operative hyperglycemia in diabetic patients undergoing open heart surgery will eliminate the incremental morbidity and mortality risks ascribed to the preoperative risk factor “Diabetes”.
The Portland Diabetic Project

The Portland Diabetic Project: Introduction

The **Portland Protocol** is a **prospective**, non-randomized, ongoing interventional study on the effects of **hyperglycemia** and it’s **pharmacologic reduction** on morbidity and mortality in cardiac surgery patients.
The Portland Diabetic Project: Logic-based design

1. Demonstrate significant independent association between hyperglycemia and each outcome endpoint under study.

2. Prove that a continuous intravenous infusion (CII) significantly reduces the incidence of each outcome.

3. Identify potential underlying mechanism of action.
DM Patient Population 1987-2004

Total OHS Patients 1987 - 2003: 21,278

Diabetic: 24%
Age: 65 ± 10 years
Sex: 65% male
Redo: 12%

n = 5,099
PDX Diabetic Project 1987-2004

Total DM OHS Patients 1987 - 2004: 5,009

Pre-Admission BG Control:

Peri-operative BG Control:
SQI = 968
PDX CII = 4041
Blood Glucose Assessment / Tabulation

1. Arterial Line Drop
2. Venous Line Drop
3. Capillary (finger-stick)

q 0.5 - 2 hour

DOS

BG-DOS

POD1

BG-POD1

POD2

BG-POD2

POD3

BG-POD3

POD4

BG-POD4

3-BG = Avg 3-day Postoperative BG

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