Improving Patient Access for an Outpatient Endocrinology Clinic

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My Collaborators

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Presentation Outline

• Motivation
• Database
• Simulation
• Conclusions
• Future Work
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Weight Management Program (WMP)

- Clinical and research program
  - Restricted medical admittance
- Identify strategies for long-term weight management for obese individuals
WMP Description

• Referred by Physician
• New visit followed by return visits
• Must adhere to schedule

<table>
<thead>
<tr>
<th>Timeline</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 3 mo</td>
<td>3 wks</td>
</tr>
<tr>
<td>3 – 24 mo</td>
<td>3 mo</td>
</tr>
</tbody>
</table>
Problem

• Current scheduling process and utilization
• Medical staff overworked
• Clinic overtime
• Affects research
• Apply IE skills to analyze
  – Database
  – Simulation
Presentation Outline

• Motivation
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Database

- Daily, year-long future reports
  - Create date
  - Appointment date
- See how the schedule evolves
- Challenges
  - Data
    - Obtaining the data
    - Patient, provider, and time perspective
  - Design
    - Future and past
- Still in progress
What is the probability of keeping an appointment based on when it was scheduled?

Percentage of Completed Appointments Based on Scheduled Date
(N = 2975, 7/2/12 - 11/3/14)
What is the capacity as of today?

Capacity as of October 6, 2014
N = 51 Days
How often is a canceled slot refilled?

<table>
<thead>
<tr>
<th>Number of Cancels</th>
<th>Number of Cancels without Refill</th>
<th>Number of Cancels with Refill</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>15</td>
<td>9</td>
</tr>
</tbody>
</table>

### Cancellation Refill Rate

<table>
<thead>
<tr>
<th>Number of Business Days</th>
<th># of Days between Cancel and Appt Date</th>
<th># of Days between Cancel and Refill date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
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<tr>
<td>6</td>
<td>3</td>
<td>1</td>
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<tr>
<td>0</td>
<td>0</td>
<td>5</td>
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<tr>
<td>19</td>
<td>33</td>
<td>41</td>
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<td>33</td>
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<tr>
<td>33</td>
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<td>0</td>
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<tr>
<td>41</td>
<td>41</td>
<td>0</td>
</tr>
<tr>
<td>72</td>
<td>72</td>
<td>0</td>
</tr>
</tbody>
</table>
Process

Patient Arrives at Clinic

Patient Waits in Waiting Room

Patient Seen by MA
- Vitals are Taken
- Medications are Updated

Patient Waits for MD

Patient Seen by MD

Patient Checks Out and Leaves the Clinic
Simulation

Address the order in which patients are seen
# Scheduling Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Determined by</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Come First Service</td>
<td>arrival time</td>
<td></td>
</tr>
<tr>
<td>First Scheduled First Serviced</td>
<td>scheduled time</td>
<td>• No-show if 30 minutes late</td>
</tr>
<tr>
<td>Hybrid</td>
<td>scheduled time unless late</td>
<td>• Protected threshold</td>
</tr>
</tbody>
</table>
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• Future Work
Conclusion

• Weight Management Program
• Ability to look into the past and the future
• Observed patterns in WMP
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Future Work

• Database
  – phpMyAdmin
  – Larger scale analyses
  – Changes over time
• Optimal Scheduling procedures
  – Actual vs. requirements
    • Double booking
    • Distribution of slots
    • Reminder system
• Waitlist
  – Procedure
  – Refill canceled slots
Acknowledgements

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• The Doctors Company Foundation
CHEPS and the HEPS Master’s Program

- **CHEPS**: The Center for Healthcare Engineering and Patient Safety
- **HEPS**: Industrial and Operations Engineering (IOE) Master’s Concentration in Healthcare Engineering and Patient Safety offered by CHEPS
- CHEPS and HEPS offer unique multidisciplinary teams from engineering, medicine, public health, nursing, and more collaborating with healthcare professionals to better provide and care for patients
- For more information, contact Amy Cohn at amycohn@umich.edu or visit the CHEPS website at: https://www.cheps.engin.umich.edu
Feedback and Questions

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