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
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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)

<table>
<thead>
<tr>
<th>Percent of Completed Appointments</th>
<th>&lt;1 Month</th>
<th>1-2 Months</th>
<th>2-3 Months</th>
<th>3-4 Months</th>
<th>4-5 Months</th>
<th>5-6 Months</th>
<th>&gt;6 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>70%</td>
<td>51%</td>
<td>49%</td>
<td>46%</td>
<td>46%</td>
<td>45%</td>
<td>41%</td>
</tr>
</tbody>
</table>
What is the capacity as of today?

Capacity as of October 6, 2014
N = 51 Days

Percent Full

Full Days
Half Days

0%
20%
40%
60%
80%
100%
120%

10/6/14
10/13/14
10/20/14
10/27/14
11/3/14
11/10/14
11/17/14
11/24/14
12/1/14
12/8/14
12/15/14
12/22/14
12/29/14
1/5/15
1/12/15
1/19/15
1/26/15
2/2/15
2/9/15
2/16/15
2/23/15

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

- # of Days between Cancel and Appt Date
- # of Days between Cancel and Refill date
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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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Come First Service</strong></td>
<td>• Determined by arrival time</td>
</tr>
<tr>
<td><strong>First Scheduled First Serviced</strong></td>
<td>• Determined by scheduled time</td>
</tr>
<tr>
<td></td>
<td>• No-show if 30 minutes late</td>
</tr>
<tr>
<td><strong>Hybrid</strong></td>
<td>• Determined by scheduled time unless late</td>
</tr>
<tr>
<td></td>
<td>• Protected threshold</td>
</tr>
</tbody>
</table>
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• **Conclusions**
• 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**
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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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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