Using Lean Manufacturing Techniques to improve the customer experience at Five Rivers Family Health Center
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Problem Statement
FRFHC seeks to enhance the experience and satisfaction of patients and staff by improving the patient flow throughout the healthcare center with primary focus related to the cycle time of patients.

Background
Five Rivers Family Health Centers (FRFHC) offers disease management, minor office procedures, obstetrics care, physical exams, wellness promotions, and women’s health services [1]. Long cycle times and poor patient flow result in dissatisfaction among patients and staff, as well as reduced productivity [2]. Techniques like brainstorming, process mapping, and statistical analysis can help identify and address areas of waste, leading to improvements in patient experience and system efficiency [2], [3].

Process Development

**Initial Analysis:**
FRFHC supplied data on no-show rates, patient volume, and patient satisfaction. This data was analyzed to assess the office’s status before implementing quality improvements.

**Quality Improvement:**
Using process maps, data was collected on patient experiences, including interruptions, and process time. Participants gave informed consent. Observations unveiled other issues. The study focused on wait time, cycle time, total time in office, and value-added vs. non-value-added time.

**Limitations:**
To assess the validity of this study’s findings, it’s crucial to acknowledge its limitations:
- No staff input
- Confusing office layout
- Lack of time

**Further Research:**
Research helped to address the issues highlighted in the study.

Results

**Patient’s Path:**
• Registration → Check-in → Exam Room → Nurse → Doctor → Check-out

**Average Duration of Process Steps**

<table>
<thead>
<tr>
<th>Step</th>
<th>Average Duration (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check-In</td>
<td>0:05:11</td>
</tr>
<tr>
<td>Callback</td>
<td>0:06:11</td>
</tr>
<tr>
<td>Exam Room (Nurse)</td>
<td>0:11:49</td>
</tr>
<tr>
<td>Exam Room (Doctor)</td>
<td>0:02:29</td>
</tr>
<tr>
<td>Check-Out</td>
<td>0:10:04</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>0:05:00</td>
</tr>
<tr>
<td>Lab Work</td>
<td>0:05:00</td>
</tr>
</tbody>
</table>

**Wait Time:**
- **Day with the longest avg. wait time:** Thursday (56 minutes 43 seconds)
- **Day with the shortest avg. wait time:** Friday (20 minutes 51 seconds)

**Overall Patient Arrival Time**

<table>
<thead>
<tr>
<th>No shows</th>
<th>Late</th>
<th>Complete</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>37%</td>
<td>38%</td>
<td>20%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Additional Patient Statistics:**
- **Patient Volume:**
  - Highest volume of patients occurred on Mondays and Thursdays
  - Lowest volume of patients occurred on Wednesday
- **Common languages spoken by patients (not English):** Spanish, French, Arabic, Swahili, Kinyarwanda

**Recommendations**

**Wait Time:**
Increasing staff-to-patient ratio reduces wait times by preventing staff from becoming overworked. Buffer times in schedules accommodate unexpected delays. PDSA cycles enable experimental improvements [4].

**Duration of Process Steps:**
No information was collected in exam rooms. Time with doctor is value-added time. No recommendations given unless further studies identify waste.

**No-Show Rates:**
Dynamic overbooking analyzes patient characteristics/history to reduce no-shows. Spaced-out overbooking appointments based on high no-show rates are key [5]. Multiple reminders especially from staff, help reduce missed appointments. Understanding reasons for no-shows aids in prevention.

**Symptoms:**
Use simple, visible symbols and clear text with high contrast. Traditional arrows indicate direction. Differentiate locations with color. Choose appropriate font for legibility. [6].

**Wrong Patient Location:**
Use simple, visible symbols and clear text with high contrast. Traditional arrows indicate direction. Differentiate locations with color. Choose appropriate font for legibility. [6].

**Future Work:**
Future works and analyses are needed for optimal improvement.
- Collecting staff input to obtain workers insights and suggestions.
- Collecting process data within the examination room to identify waste.
- Analysis on recommendations implemented within the office to test their effectiveness in improving patient and staff experience

Acknowledgments
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References