DMAIC TOLLGATE

Improving throughput of the refugee program at CarePoint East
Problem/Goal Statement

Problem: The demand for the refugee program has been increasing steadily. In order to withstand current and future demand, the total service time for refugee processing needs to be reduced. Current processing time during peak demand (Tuesdays with a total of 60 refugees) is at least 9 hours with staff working 10-12 hours (including overtime). This is unacceptable to withstand any future demands.

Goal using SMART criteria:
• Reduce total service time for refugee processing on Tuesdays to less than 8 hours
• Reduce total staff working time on Tuesdays to 8 hours

Leverage and strategic implications: Reducing service time will allow for processing additional refugees which in turn will increase revenue. Reducing staff working time will provide capacity for future demand and increase employee and refugee satisfaction.

Business Case

Business impact:
• Each additional refugee processed provides additional revenue of $996
• Total revenue for the previous year (Sep 13-Oct 14) was $1,441,769
• In 2014, increased demand of 223 patients equated to additional revenue of $222,108. A projected continued increase in demand should secure at least an additional $200K per year

Expected Overtime Savings: $16,612 (2014)

Soft Benefits: Additional savings from increased productivity and reduced stress from being overworked.

Customer: Administration
Stakeholder: Management
Beneficiary: Refugees

Scope

• Scope in: All processing steps in refugee program, shared aspects of occupational medicine, Interpretation services. Focus will be peak time of Tuesdays, mainly the refugee screening process.
• Scope out: Refugee transportation
• Decision rights: Team Leader, Project Sponsor

Gate Review Schedule

<table>
<thead>
<tr>
<th>Tollgate</th>
<th>Scheduled</th>
<th>Revised</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define</td>
<td>1/6/15</td>
<td>2/11/15</td>
<td>2/12/15</td>
</tr>
<tr>
<td>Analyze</td>
<td>3/9/15</td>
<td>3/30/15</td>
<td>3/31/15</td>
</tr>
<tr>
<td>Improve</td>
<td>4/21/15</td>
<td>4/20/15</td>
<td>4/21/15</td>
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<tr>
<td>Control</td>
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</table>
Patient Volume:
- 2014: 1422 total screening visits; Monthly average 118 patients
- 2013: 1199 total screening visits; Monthly average 99 patients

Increased annual demand of 223 patients equates to increased revenue of $222,108 (at $996 per Refugee patient seen)

Employee Feedback:
- 40% think teamwork does not exist in the department
- 55% would not support cross-training to improve process flow
- 40% are satisfied with the current work-flow
- 50% think communication is encouraged within the department
- 50% think job duties and responsibilities are clearly defined
- 55% think staffing is insufficient to meet dept requirements
From November 2014 through January 2015, 495 Refugees were seen on Tuesdays compared to 147 on Mondays. This is 70% more daily demand on Tuesdays.

**Overtime pay** was reduced from $21,690 in 2013 to $16,612 in 2014. This 23% reduction has a positive financial impact and we would like to further reduce this departmental expense.

**Employee interview takeaways to improve process efficiency**

- Cross-training to assist with paperwork
- Dedicated MA to assist Diana with Vaccinations
- Clear Process Step Stations
  - Consider adding another VS station (Height/Weight)
- Clear method to track Standard Operating Procedure
  - Include checklist, Andon/white board, wristbands
- Adjust work hours so there is enough staff at 5pm on Tuesdays

The current process is off center and not close to the target specification of 224 minutes. However, once centered the process is capable of meeting the target.
Future State VSM:
- Introduction: 40 minutes
- Screening: 29 minutes
- Vaccinations: 9 minutes
- Goal to reduce waiting times by 30% from Current state

5 Why Analysis & Fishbone:
- Long Service Times: No Control over Drop-offs, Language barriers, No Visual Queues or Checklist, Under staffing, lack of SOP
  - High Overtime Cost:
    - Paperwork: Sequential Processing, Dedicated resources for paperwork, No Cross-training
  - Multi-tasking: Lack of enough Live Interpreters, No Cross-training, No Visual Queues, Checklist, Budget

Quick Wins:
- Establish a **simple process** for the employees to record times for various process steps. This will help in any future analysis and enhancements to the processes.
- Establish a **simple process** for the employees to record wait due to interpreter availability. This will help support budget request for interpreters. This will make the process measurable and the problems visible.

There are many opportunities for potential failures in each of these areas and detection is only visible after the process is running, which is too late.
1. Utilize a white board to easily identify process step each family and member is in
2. Utilize OSU foreign language students as student interpreters
3. Implement a checklist that travels with each family and a color coding system to identify who is a family and where they are in the process
4. Hire on additional staff
5. Modify lab room – add a second station for blood draw and immunizations
6. Implement a rolling cart with machines for Vitals, Hearing, and blood draw staffed by two people
7. Adjust schedules to have more staff on Tuesday to match supply with demand (incentivize with reduced hours another day to keep at 40 hours)
8. Additional FTE split between departments to assist with clerical paperwork in Refugee Program
9. Create and Maintain HR Dashboards to ensure that staffing is maintained at optimal levels
10. Open a secondary facility to decrease bottlenecks
11. Many-To-Many Queue structure – One staff member is assigned to one family, staying with that family until all tasks are completed
12. Add an additional vital signs station (height and weight section) to reduce bottlenecks.
13. Secure live interpreters in major languages to facilitate more efficient refugee visits.
14. Add one dedicated staff to assist with lab draw and immunizations
**SHORT TERM**

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>Improvement</th>
<th>How?</th>
<th>Owner</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>White board Implementation</td>
<td>On a white board include family initials, current process step, and remaining processes. Include time in/time out if possible. This aids is standardization and process step transitions.</td>
<td>Management/Staff</td>
<td>Implemented</td>
</tr>
<tr>
<td>14.</td>
<td>Add staff to assist with labs</td>
<td>Adjust schedule to have one dedicated staff to assist with lab draw and immunizations during peak times to improve efficiency with this process step.</td>
<td>Management</td>
<td>Implemented</td>
</tr>
<tr>
<td>13.</td>
<td>Live interpreters</td>
<td>Secure live interpreters to aid in screening, physical, and adjustment of status processes. Our cost-benefit analysis supports live interpretation services (vs. audio/video) for the refugee program.</td>
<td>Management</td>
<td>Implemented</td>
</tr>
<tr>
<td>8.</td>
<td>Split FTE, Cross -training</td>
<td>Split FTE between departments (i.e.. occupational med. or employee health with the refugee program) to have dedicated staff to assist with clerical duties and paperwork.</td>
<td>Management</td>
<td>Implemented</td>
</tr>
<tr>
<td>12.</td>
<td>Add Vitals Station</td>
<td>Add an additional equipment (Height stadiometer and weighing scale) to allow simultaneous taking of vital signs to improve efficiency and minimize the bottleneck.</td>
<td>Management</td>
<td>0-3 months (pending-equipment ordered)</td>
</tr>
<tr>
<td>7.</td>
<td>Adjust schedules with current staff</td>
<td>Hourly employees schedules should be modified in order to match supply to demand by lengthening work time on Tuesday and shortening other workdays.</td>
<td>Management</td>
<td>0-3 months</td>
</tr>
</tbody>
</table>
## Improvement Plan

### MID TERM

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>Improvement</th>
<th>How?</th>
<th>Owner</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Student interpreters</td>
<td>The department should work with the foreign language departments at OSU to develop a pool of students with the requisite skills to act as part-time interpreters. These could be paid or unpaid internships for resume building, while providing a nominal cost for adequate staffing of interpreters.</td>
<td>Management</td>
<td>3-12 months</td>
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<tr>
<td>5.</td>
<td>Additional Blood Draw Stations/modify existing lab room</td>
<td>In order to increase efficiency, a second blood draw station should be added so that multiple draws and immunizations can take place at once. This can be made possible by modifying the available space in the existing lab to accommodate 2 patients simultaneously, which would minimize the bottleneck.</td>
<td>Management</td>
<td>3-12 months</td>
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<tr>
<td>3.</td>
<td>Traveling Checklist/Color system</td>
<td>In order to prevent delays due to miscommunications. Each family should have a traveling checklist with employee sign-offs after a step is completed. Assign each family member a color wristband or sticker to easily identify family members.</td>
<td>Staff</td>
<td>3-12 months</td>
</tr>
<tr>
<td>4.</td>
<td>Hire additional staff</td>
<td>Consider modifying schedules when hiring new staff in order to match supply to demand so that the high-volume Tuesday is sufficiently staffed to allow work completion by 5pm.</td>
<td>Management</td>
<td>3-12 months</td>
</tr>
</tbody>
</table>

### LONG TERM

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>Improvement</th>
<th>How?</th>
<th>Owner</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Many-to-Many Queuing</td>
<td>Develop a structure in which an individual or a team are assigned to a family to take them through the entire process. This helps to prevent delays related to miscommunication by creating a single touch point and minimizes errors (missed vitals, etc)</td>
<td>Management/Staff</td>
<td>&gt; 1 Year</td>
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### Implemented Improvements

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<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Implement Changes</td>
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<tr>
<td>2</td>
<td>Randomly select 5 samples on each Tuesday&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>3</td>
<td>Analyze the data from selections&lt;sup&gt;2&lt;/sup&gt;</td>
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<tr>
<td>4</td>
<td>Focus group to identify issues in the implementation and fixes</td>
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<tr>
<td>5</td>
<td>Repeat steps 1-4 until issues are resolved&lt;sup&gt;3&lt;/sup&gt;</td>
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<sup>1</sup> – To ensure adequate sample size and enough time for patterns to develop, a minimum of 4 weeks should be used to obtain a sample of 20 families. To improve the quality and reliability, the department should consider collecting samples upward of 6 weeks post implementation.

<sup>2</sup> – To analyze the data, the department should use the same tools (specifically the Control Chart and CpK) to determine if adequate improvements have been made.

<sup>3</sup> – It is important to note that step 5 is only necessary if, after the focus group determines that changes will improve utility, management believes that the benefits of additional improvements will outweigh the costs. Note that explaining the reason for not implementing is crucial for future employee engagement and buy-off.

### Future Improvement Plans

- ✓ For all future state improvements, it will be critical to follow the same process as noted above
- ✓ Implementation should follow Lowest Effort, Highest Impact to Highest Effort, Lowest Impact
- ✓ Based on Return on Investment:
  - ❖ Management should review the High Effort, Low Impact improvement plans to determine if they are worth the investment.
    - ➢ Not all positive ROI plans should be implemented
    - ➢ Any negative ROI plan should be immediately disregarded
## Control Plan

<table>
<thead>
<tr>
<th>Process</th>
<th>Responsibility</th>
<th>Measurement</th>
<th>Control Method</th>
<th>Reaction plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection (Measure System)</td>
<td>Staff</td>
<td>Service Time</td>
<td>SOP</td>
<td>• Monitor weekly service &amp; wait times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wait Time</td>
<td></td>
<td>• 5S if not meeting target time</td>
</tr>
<tr>
<td>Staff Buy-In (Incentive)</td>
<td>Management</td>
<td>Risk Priority #</td>
<td>Cost &amp; Benefits</td>
<td>• Monitor monthly employee feedback</td>
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<tr>
<td></td>
<td></td>
<td>(RPN)</td>
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<td>• Collect more data to compare/contrast</td>
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<td></td>
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<td></td>
<td>• Create quick wins to gain support</td>
</tr>
<tr>
<td>Implementation (Prioritization &amp; Management)</td>
<td>Management</td>
<td>Service Time Wait Time</td>
<td>SOP</td>
<td>• Monitor weekly service &amp; wait times</td>
</tr>
<tr>
<td></td>
<td>Staff</td>
<td></td>
<td></td>
<td>• Kaizen if not meeting target</td>
</tr>
</tbody>
</table>
## Failure Mode Effects Analysis (Control)

<table>
<thead>
<tr>
<th>Failure Mode (expected)</th>
<th>A) Severity Probability</th>
<th>B) Occurrence Probability</th>
<th>C) Detection Probability</th>
<th>Risk Priority Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay due to interpreter availability</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Staff resistance (to room modifications/process changes)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>White board maintenance (keeping it up to date)</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Color coding system issues</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>12</td>
</tr>
</tbody>
</table>

Staff resistance is expected to be the next critical issue.
Summary and Next Steps (Control)

Sustaining

✓ Ongoing data collection and improvements
✓ Centralized information sharing system

Implementation To-Do

- Continuous feedback loop from employees
- Centralized information system for robust data collection
- New hire training/cross-training
- Manager’s conference for sharing best practices from other areas
- Create and distribute control plan document outlining ongoing responsibilities

Project Benefits Summary (expected)

✓ Total processing time for a refugee reduced by 2 hrs.
✓ Staff overtime cost reduced by at least 50%
✓ Total wait time reduced by 30%

Project Closeout

Stakeholder Review

A formal project hand-off meeting is scheduled on April 21st, 2015 with the process owner(s) who will accept management responsibility and review sustainable measures.

Recommended Next Steps

✓ After implementing the recommended improvements collect data (at least 20 samples over a 3 weeks period)
✓ Plot control charts and compare to the baseline performance
✓ Identify and prioritize problems
✓ Run through the DMAIC cycle

Lessons Learned

✓ Centralized information system or well defined data collection process is critical
✓ Even a small change is tough to manage