CT Utilization

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St. John Health  
2008 Lean Six Sigma Conference  
Session H1

Agenda

Objectives and Introduction  
CT utilization and throughput  
- New technology  
- Value Stream Map  
- Emergency Department throughput

Rapid Improvement Event (Kaizen)  
- Day 1 – Brainstorm issues  
- Day 2 – Brainstorm solutions  
- Day 3 – Pilot and measure  
- Day 4 – Pilot, plan rollout and FMEA  
- Post project
Objectives

At the conclusion of this presentation, you will be able to:

- Understand Takt time analysis for healthcare processes
- Understand load balancing techniques
- Understand using a production control board for variable processes

Introduction

Organization – St. John Health  Detroit, MI
- Member of Ascension Health
- Comprised of 7 hospitals and over 100 medical facilities in southeast Michigan
- Guided by our Mission; shaped by our Values
  - Committed to providing spiritually centered, holistic care
  - Sustain and improve the health of individuals in the communities we serve, with special attention to the poor and vulnerable
  - $146 million in uncompensated care FY’05
- Vision for the Future
  - Together, we provide the highest quality patient care experience, every day, everywhere, for everyone.
Background - SJH

St. John Health
Process Improvement Methodology
- Launched Six Sigma Oct 31st, 2003
- Launched Lean November 3rd, 2005

Six Sigma
- 41 projects in 3 waves over 2 years
- $8.8 million in documented savings
- Average sigma level 1.5
- Average improvement 33 – 50% per project

Lean
- 75 projects in under 2 years
- Documented improvement in throughput, cycle time, associate satisfaction, physician satisfaction
- Average improvement 50 – 75% per project

Introduction - CT

Computed Tomography
- 64 slice latest in production
- Used by all patient types
- CT Angiograms gaining support
Goals

Emergency Department Throughput

- Health system goals
  - 150 minutes for discharged patients
  - 270 minutes for admitted patients
- Patient satisfaction scores
  - Overall experience
  - Wait time for radiological exams

Problem Statement

Emergency Department Throughput

- Current process
  - 180 minutes for discharged patients
  - 330 minutes for admitted patients
- 30% of ED patients have a CT exam ordered
ED Value Stream Map

From exam order time to exam start time  Range : 20 - 337 minutes
From exam complete time to results available time  Range : 155 – 688 minutes

Day 1  Brainstorming Issues

- No consistent process
  - Job sharing
  - Ordering exams
  - Patient flow pattern

- Different types of CT exams
  - Without contrast
  - With contrast
Day 1  Brainstorming Issues

- Unique technologist requirements

- Takt time of process
  - Customer demand of 84 tests a day
  - 2 machines
  - 34 minutes a test

Day 1  Brainstorming Issues

- Transcription delays

- Patterns of patient flow

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Hour of the Day

<table>
<thead>
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<th>Number of Patients</th>
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<tbody>
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ED Traffic Pattern

CT Tests per Hour

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30
25
20
15
10
5
0

CT Tests per Hour

Hour of Day
Day 2  Brainstorm Solutions

• Standard work for technologists

• Load level patient types

• Standard work for aides

• Production control board
Day 2  Brainstorm Solutions

- Visual control for file room
  - Tag ED labels
  - Pull patient charts
- CT assignments
  - Machine 1 – Outpatient
  - Machine 2 - Inpatient and ED
- Communication protocols
  - Education of exam types

Day 3  Run the Pilot

- Education plan
- Set goals and measure results

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<th>Measurement</th>
<th>Start</th>
<th>Target #s</th>
<th>Target %</th>
<th># at end</th>
<th>% Change</th>
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<tbody>
<tr>
<td>Without contrast</td>
<td></td>
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<td></td>
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<tr>
<td>- Order to Exam</td>
<td>117 mins</td>
<td>25 mins</td>
<td>89%</td>
<td>39 mins</td>
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<td>56 mins</td>
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<td>30 mins</td>
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Day 4  Finalize process

- Document SOPs
- Education roll out
- Develop measuring tool
- FMEA

Post Project

- Process Owner turnover
- Reporting tool
- Executive sponsor review
Summary

At St. John Health...

- Due to the dynamics of patient demand, not every process can be load balanced, but attempts will be made when possible
- Takt time reflects more of the demand of the individual process vs. the total customer demand
- Production control boards are a useful tool for maintaining patient flow
- A key element in our Rapid Improvement Events are Process Owner accountability, and a clear data collection plan before, during, and after the project week

Thank you for your attention!

Questions and Answers...