Laboratory Quality Confab 2009

Applying Lean Six Sigma to Patient Registration to Improve Billing Processes

September 30, 2009
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Nora Hess, Operations Managing Consultant
Mission, Vision, and Guiding Values

- **Mission**
  Washington Hospital Center, a valued member of MedStar Health, is dedicated to delivering exceptional PATIENT FIRST health care. We provide the region with the highest quality and latest medical advances through excellence in patient care, education, and research.

- **Our Vision**
  To be the trusted leader in caring for people and advancing health.

- **Guiding Principle**
  To treat each patient as we would a member of our own family by providing the best medical treatment with caring and compassion, responsive service, and intelligent use of resources. Through this achievement, we will be recognized as a national model for excellence in patient-centered care.
# Key Objectives

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Document current billing process (registration (\rightarrow) bill).</td>
</tr>
<tr>
<td>2</td>
<td>Understand, identify, and prioritize current risks with billing.</td>
</tr>
<tr>
<td>3</td>
<td>Make recommendations for process improvement.</td>
</tr>
<tr>
<td>4</td>
<td>Make recommendations for conversion to Atlas/Sunrise from a process point of view.</td>
</tr>
</tbody>
</table>
Problem Statement

The objective for this project is:

1. To further refine the billing process prior to conversion to a new vendor.

2. To guide the Billing Department in implementing the right processes from the start to maximize collections and profitability of the program.

Scope
Beginning: Patient approaches registration desk.
End: Bill is completed.

Project Goals and Objectives
Make recommendations for improvements and preparation for implementation.
Summary of Project Team
On-site Analysis Conducted:  August 20-22, 2008

- **Champion:** Cathie Monge
- **Leader:** Bill Romanelli
- **Mentor:** Hans Froehling

- **Team Members:**
  - Dawn Sydney (Billing Manager)
  - Monique Smith (Billing Coordinator)
  - Samantha Wooten (Billing Representative)
  - Tina Teneyck (Billing Representative)
  - Annette Herring-Hering (Billing Representative)
  - Deloris Lynch (Supervisor MDL PSCs)
  - Darlene Dugar (Coordinator PSCs)
  - Karen Keith (Registrar)
  - Deborah Hubb (Registrar)
Summary
Key Customers, Suppliers, and Outputs

SIPOC DIAGRAM

Process/Project Name: MedStar Billing Project
Date: 08/20/2--808
Prepared By: Hans Froehling

<table>
<thead>
<tr>
<th>Suppliers</th>
<th>Inputs</th>
<th>Process</th>
<th>Outputs</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Input</td>
<td></td>
<td>Output</td>
<td>Recipient of Output</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Requirements (optional)</td>
<td>Description</td>
<td>Requirements (optional)</td>
</tr>
<tr>
<td>Patient</td>
<td>Information</td>
<td>complete/correct</td>
<td>Test result</td>
<td>complete/correct</td>
</tr>
<tr>
<td>Physician</td>
<td>Information</td>
<td>complete/correct</td>
<td>Bill</td>
<td>complete/correct</td>
</tr>
<tr>
<td>Registrar</td>
<td>Information</td>
<td>complete/correct</td>
<td>Registrar</td>
<td></td>
</tr>
<tr>
<td>Phlebotomist</td>
<td>Information</td>
<td>complete/correct</td>
<td>Phlebotomist</td>
<td></td>
</tr>
<tr>
<td>Customer Service</td>
<td>Information</td>
<td>complete/correct</td>
<td>Customer Service</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>Information</td>
<td>complete/correct</td>
<td>Sales</td>
<td></td>
</tr>
<tr>
<td>Billing</td>
<td>Information</td>
<td>complete/correct</td>
<td>Billing</td>
<td>Administration</td>
</tr>
</tbody>
</table>

See High Level Process Steps Below

Start Boundary: Approach Registration
Sign In → Register → Draw Blood → Test/Send Out → Bill
End Boundary: Create Bill
Voice of Customer

What we wanted to know: What are key customer requirements?

1. Short Wait Time
2. Correct Result
3. Individualized Caring Attention
4. Correct Bill

What we learned: Wait times currently fluctuate; staff is highly motivated to please clients; billing process can be improved by integrating workflows.
Current Process

Greeting
- Start
- Register
- Make Copies Insurance/ID
- Test Lab By Ins.
- Complete Requisition (Patient)
- Complete Requisition (Receptionist)
- Wait

Registration
- Call Patient
- Wait
- Mini-Registration
- Information Missing?
  - Yes: Verify Information
  - No: Information Available?
    - Yes: Gather and Put Stickers on Requisition
    - No: File Reqs

Phlebotomy
- Print Label
- Wait
- Draw Blood
- Prepare For Inhouse or Send Out
  - MDL, Quest, or LabCorps
- Result Test
- Send Result To Physician

Customer Service
- Retrieve Missing Information (4000)

Sales
- Set Up?
  - Yes: Set Up Account Based on New Information
  - No: End

Billing
- Follow Up With Missing Information
- Scan Reqs
- Communicate with Billing Service
- Disseminate Report
- Receive Money

Quest
- MDL, LabCorp
Current Process (cont.)

- There are multiple hand-offs.
- There is a functional rather than process orientation.
- The overall facility layout is conducive to effective workflow.
- The reception desk creates bottlenecks when queues are large.
- The copier is removed from first point of contact.
- Patients sign in and are called for further processing; patients sometimes do not hear the call.
- Personnel is highly motivated and acts in accordance with the guiding principles of the MedStar system.
- Personnel is highly experienced.
Failure Modes and Effect Analysis (FMEA)

First used in the aerospace industry in the mid-1960s to detect aircraft problems before leaving the ground. The U.S. Food and Drug Administration requires FMEA to launch new medical devices or drugs.

FMEA is used to:

- Identify how a product, service, or process can fail
- Estimate risk associated with specific failure causes
- Prioritize actions to reduce risk of failure
- Evaluate product/service design validation or process control plans
A Failure Modes and Effect Analysis was conducted to determine current high-risk processes and improvement opportunities. Multiple failures can have multiple effects, and one failure can have multiple effects.
Steps to Perform FMEA

1. Review the process and understand the basic functional elements
2. Brainstorm all potential ways the process, product or service could fail
3. Identify one or more potential effects and causes of each failure
4. Develop a rating scale (1-10 or 1-5)
   1. Severity (S): What is the effect or impact of the failure?
   2. Occurrence (O): How often could the failure occur?
   3. Detection (D): Are controls or measures in place that increase ability to detect the failure?
5. Rate each of the above factors (S-O-D)
6. Calculate the risk priority number (RPN) for each effect
Step 6: Calculate the Risk Priority Number (RPN)

- The output of an FMEA is the Risk Priority Number.
- The RPN is a calculated number based on information you provide regarding:
  - The potential failure modes,
  - The effects, and
  - The current ability of the process to detect the failures before reaching the customer.
- The severity of the effects multiplied by the rating on how often it occurs multiplied by the ability to detect.

\[
\text{RPN} = \text{Severity} \times \text{Occurrence} \times \text{Detection}
\]

Note: Severity, Frequency of Occurrence, and Detectability of Error were measured on a five-point rather than ten-point scale to simplify the calculation method and reduce time to conduct the FMEA.
## Steps to Perform FMEA

7. Prioritize the failure modes using the RPN

8. Develop plans to reduce or eliminate the risk associated with the high priority failure modes

1. Identify potential causes

2. Develop preventive or contingent action steps to be taken

3. Assign responsibilities

9. Implement plans and document actions

10. Recalculate RPN

<table>
<thead>
<tr>
<th>Process Steps or Product Functions</th>
<th>Potential Failure Mode</th>
<th>Potential Effects of Failure</th>
<th>Severity</th>
<th>Potential Cause(s) of Failure</th>
<th>Occurrence</th>
<th>Current Controls</th>
<th>Detection</th>
<th>Risk Priority Number (RPN)</th>
<th>Recommended Action</th>
<th>Responsibility and Target Completion Date</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reception</td>
<td>Wrong patient demographics</td>
<td>Wrong patient</td>
<td>1</td>
<td>High Volume</td>
<td>2</td>
<td>Verification of information at registration</td>
<td>5</td>
<td>10</td>
<td>FIFO, One-Piece Flow, Fewer tasks</td>
<td>Dawn</td>
<td></td>
</tr>
<tr>
<td>Reception</td>
<td>Wrong patient demographics</td>
<td>Wrong bill</td>
<td>1</td>
<td>High Volume</td>
<td>2</td>
<td>Verification of information at registration</td>
<td>5</td>
<td>10</td>
<td>FIFO, One-Piece Flow, Fewer tasks</td>
<td>Dawn</td>
<td></td>
</tr>
<tr>
<td>Copies</td>
<td>No ID</td>
<td>Call by Receptionist or registrat or billing</td>
<td>4</td>
<td>Lost, stolen, forgotten</td>
<td>5</td>
<td>1. Ask for insurance; 2. Call Dr. Office, Look up on base</td>
<td>1</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete Req by patient</td>
<td>Delay in drawing blood; One-Piece Flow interrupted</td>
<td>Illegible</td>
<td>3</td>
<td>Human error</td>
<td>5</td>
<td>Registrar should confirm spelling; QA process</td>
<td>1</td>
<td>15</td>
<td>Refresher Training on verification</td>
<td>Darlene</td>
<td></td>
</tr>
</tbody>
</table>
Analyze: FMEA

FMEA of complete process

What we learned: Action items and owners are documented in the Excel file above. Action items and owners are listed in table format on slides 15-17. A follow-up call will be conducted to determine if the recommended action items were implemented.
**FMEA: Summary of RPNs**

<table>
<thead>
<tr>
<th>RPN</th>
<th>Process Steps or Product Functions</th>
<th>Potential Failure Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>No Diagnosis Code</td>
</tr>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>Wrong DOB</td>
</tr>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>Incorrect Physician</td>
</tr>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>No Physician</td>
</tr>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>Incorrect Spelling</td>
</tr>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>Missed Test</td>
</tr>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>ABN Not Complete</td>
</tr>
<tr>
<td>125</td>
<td>Mini-Registration</td>
<td>ABN Not Signed</td>
</tr>
<tr>
<td>125</td>
<td>Gather and Put Labels on Req</td>
<td>Missing Stickers</td>
</tr>
<tr>
<td>64</td>
<td>Print Label</td>
<td>Out of Paper</td>
</tr>
<tr>
<td>50</td>
<td>Mini-Registration</td>
<td>Lost Requisition</td>
</tr>
<tr>
<td>30</td>
<td>Print Label</td>
<td>Incorrect Patient</td>
</tr>
</tbody>
</table>

**What we learned:** Most billing-related errors can be “caught” in the front-end “Mini-Registration” process. Emphasis should be put on this area for improvements. The fields with the highest risk of either resulting in a write-off or in an expanded accounts receivable cycle are listed above. Other areas for improvement concern the consistent quality of copies of insurance cards and other pertinent information.
Summary of Root Cause Analysis

What we learned: While some root causes of billing delays or write-offs are out of the control of the registration personnel (see environment), other root causes are within their control. Action items to address these root causes are documented on the next three pages.
## Process Step, Failure Mode, Action Item, and Owner

<table>
<thead>
<tr>
<th>Process Step in Billing Cycle</th>
<th>Potential Failure Mode</th>
<th>Recommended Action</th>
<th>Responsibility and Target Completion Date</th>
<th>Current Status/Expected Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reception</td>
<td>Wrong Patient Demographics</td>
<td>FIFO, One-Piece Flow, Fewer Tasks</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Completed; numbering system used to ensure FIFO</td>
</tr>
<tr>
<td>Copies</td>
<td>Too Light</td>
<td>Regularly Review in Cartridge</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Completed; every registrar has copy of optimal copy; copier gives signal when toner is low</td>
</tr>
<tr>
<td>Copies</td>
<td>Too Dark</td>
<td>Regularly Review in Cartridge</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Completed; see above</td>
</tr>
</tbody>
</table>

**What we learned:** Process step in billing cycle, potential failure mode, recommended action, and owner of action item.
### Process Step, Failure Mode, Action Item, and Owner (cont.)

<table>
<thead>
<tr>
<th>Process Step in Billing Cycle</th>
<th>Potential Failure Mode</th>
<th>Recommended Action</th>
<th>Responsibility and Target Completion Date</th>
<th>Current Status/Expected Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Req By Patent</td>
<td>Delay in Drawing Blood; One-Piece Flow</td>
<td>Refresher Training on Verification</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Step1: Registrar training on insurance; Step2: Cross-training with billing personnel</td>
</tr>
<tr>
<td>Call Patient</td>
<td>Patient Not Available</td>
<td>Sign System (Andon)</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Completed; numbering system in place; patient receives number</td>
</tr>
<tr>
<td>Call Patient</td>
<td>Patient Doesn’t Clearly Hear Their Name</td>
<td>Sign System (Andon)</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Completed; see above</td>
</tr>
<tr>
<td>Mini-Registration</td>
<td>No Diagnosis Code</td>
<td>Laminated Job Aid</td>
<td>What, Why, So What; Dawn, Darlene, Monique, Dolores, and Bill</td>
<td>Completed</td>
</tr>
</tbody>
</table>

**What we learned:** Process step in billing cycle, potential failure mode, recommended action, and owner of action item.
### Process Step, Failure Mode, Action Item, and Owner (cont.)

<table>
<thead>
<tr>
<th>Process Step in Billing Cycle</th>
<th>Potential Failure Mode</th>
<th>Recommended Action</th>
<th>Responsibility and Target Completion Date</th>
<th>Current Status/Expected Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-Registration</td>
<td>ABN Not Signed</td>
<td>Inform Physician; Don’t Order Test</td>
<td>Registrar</td>
<td>Completed</td>
</tr>
<tr>
<td>Gather and Put Labels on Req</td>
<td>Missing Stickers</td>
<td>Double Check All Requisition</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Completed</td>
</tr>
<tr>
<td>Follow Up Missing</td>
<td>Physician Information</td>
<td>Set-up Schedule for Cross-training of Billing and Registration Personnel</td>
<td>Dawn, Darlene, Monique, Dolores, Bill</td>
<td>Cross-training schedule completed</td>
</tr>
</tbody>
</table>

**What we learned:** Process step in billing cycle, potential failure mode, recommended action, and owner of action item.
Recommended Actions

- Retrieve information at front end of registration process.
- Develop cross-functional teams and rotate responsibilities.
- Implement action items and controls documented in FMEA.
- Ensure that copier is set at right “level” so that ID and insurance information can be consistently read.
- Review phlebotomy labeling machine every 75th patient.
- Ensure all documentation is handed over to Billing for scanning in the evenings.
- Monitor costs of outbound calls to retrieve missing information in Billing.
Recommended Actions (cont.)

- Develop process mentality rather than functional mentality.
- New systems/vendors will not fix all process-related risks identified in FMEA.
- Follow-up meeting conducted (via teleconference) to confirm that action items were implemented.
- Evaluate the impact of action implementation via AR and write-off data.
Monitoring Overall Performance

**Total Error Goal:** 1.0% of Total Reqs or average high of 40 per month. (Industry standard is 3% or 120 per month based on current volumes.)
Strategies to Sustain the Gain

1. Continue to in-service staff by daily review of the errors realized.
2. Present “live” data at staff meetings.
3. Continue to monitor, document results, and discipline if appropriate.
4. Continue to acquire front-end connectivity.
5. Maximum acceptable error rates per employee established. Disciplinary guidelines presented to staff.
6. Start some Lean processes in October/November.
7. Continue to monitor the new Lean enhancements.
Monitoring Individual Performance

Goal: Four errors per person per month.

Monitor each input operator and the entire department.
Daily presentation of the errors by employee.
Monthly posting of errors.

Time to challenge current goal of four errors per person per month!
Financial Benefits of Decreasing Errors

- Decrease of $60,000 in write-offs per year.
- Decrease in accounts receivable of $210,000 per year.
- Redeployment of 1.5 FTEs with cost avoidance of $60,000 per year.
- Total Investment: Intensive three-day Kaizen event.
Great ideas are one thing.

A great outcome is our thing.

We are a healthcare diagnostics and quality consultancy intent on delivering cost savings, new revenue, and optimized operations.

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