A Journey
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Making The Hospital A Safer Place

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St. Alexius Medical Center
Bismarck, North Dakota

GS1 global Healthcare User Group – GS1 HUG
June 8, 2007
Orlando, Florida
St. Alexius Medical Center Campus
Consolidated Distribution Center
9 Foreign Countries and 11 Cities

- Toronto, Canada
- Santo Domingo, Dominican Republic
- Bogota, Columbia South America
- Lima, Peru
- Bangkok, Thailand
- Dubia, United Arab Emirates
- Halifax, Nova Scotia
- Medellin, Columbia South America
- Cali, Columbia South America
- Singapore, Southeast Asia
- Sydney, Australia
Presentation Overview

- Share the St. Alexius Story - - - our journey
- Talk about the current status of the health industry supply chain.
- Identify its deficiencies and the changes that are needed
- Provide examples for Auto ID technology and how it can be used to improve patient safety
- Present a vision for what the health care supply chain model of the future should look like
Outcome For Today

• Gain a better understanding of how industry standards and Auto ID technology can be help make hospitals safer

• From the St. Alexius journey over the past three decades I want to share what I believe is the health care supply chain model of the future and how this model will increase operational efficiencies, reduce the cost of healthcare and improve patient safety.
Expanded Role of the Health Industry's Supply Chain

- Meeting the JCAHO Patient Safety Goals
- Improving quality of patient care
- Traceability – Critical to the industry especially with FDA
- Controlling utilization
- Reducing cost
St. Alexius Supply Chain Time Line

From 1968 to Present

- 1968  Centralized Purchasing Operation
- 1969  First Electronic Order to Vender
- 1972  Off-Site Distribution Warehouse
- 1975  Bar Code Strategy
- 1976  MMIS Main Frame – Developed Proprietary UPN
- 1984  First EDI Order – Computer to Computer
- 1987  Implement Pharmacy Bar Code System
- 1993  Successfully Implemented a Bedside Scanning Demonstration Project with HIBCC
St. Alexius Supply Chain Time Line
From 1968 to Present

- May 1994    Implemented Scanning Bar Codes at Receiving Dock
- July 1995   Integrated Universal Product Number (UPN) into MMIS
- Nov 1995    Expanded 18-Bed Demonstration Project
- Dec 1996    Served as Pilot Site for Developing UPN Repository
- Mar 1997    Implemented RF Scanning at the Receiving Dock
- 1997–Present Educating all Health Industry Stakeholders Through Organizations like U Connect and other Associations
<table>
<thead>
<tr>
<th>Year Range</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 – 2002</td>
<td>Pilot Site with GS1 USA to Field Test the RSS (Alcon, Abbott, Baxter and Pfizer Labs)</td>
</tr>
<tr>
<td>Jun 2004</td>
<td>Implemented scanning of the Bar Coded Patient Wrist Bands (using linear bar codes)</td>
</tr>
<tr>
<td>Aug 2004</td>
<td>Requested our IT staff to Create Tracking Capabilities to Monitor Scanning Process at the Patient Bedside</td>
</tr>
<tr>
<td>Dec 2005</td>
<td>Installed Bar Code Printers at Nursing Stations to Print Replacement Wrist Bands When Necessary (No excuses)</td>
</tr>
<tr>
<td>Feb 2005</td>
<td>Developed Corporate Goal to Achieve 95% Compliance with Scanning Wrist Bands When Medications are Administered</td>
</tr>
</tbody>
</table>
St. Alexius Supply Chain Time Line
From 1968 to Present

• July 2005  Budgeted to transition from main frame based to windows based (Caduceus Systems) MMIS
• Aug 2005  Completed a feasibility study for an MMIS to link the supply chains of 27 rural hospitals and nursing homes using a state-of-the-art MMIS with wireless technology and real time data capture technology
• Feb 2006  Met with congressional leadership to explore grant funding opportunities
• Mar 2006  Continue to pursue $3 million in grant funds
• Apr 2007  Began implementation of the Caduceus Systems Materials Management Information System
EHCR--An industry-wide initiative of manufacturers, distributors and providers focused on streamlining the healthcare products supply chain

Efficient Healthcare Consumer Response Initiative

KEY TENETS

Executive Committee

Strategic Operating Committee

- Activity Based Costing
- Information Technology
- Codification UPN
- Contract Process
- Purchase Order Payment
- Continuous Replenishment
- Inventory Management
EHCR Strategies
$11 Billion Savings Opportunity

- Efficient Product Movement
  $6.7 Billion
- Efficient Order Management
  $1.7 Billion
- Efficient Information Sharing
  $2.6 Billion
EHCR Vision Goals

• Increase Electronic Transactions by 95%
• Improve Invoice Accuracy to 100%
• Become Paperless with 90% of Trading Partners
• Reduce Inventory in the Supply Chain by 80%
• Eliminate 50% of Product Stop Points
• Improve Service Levels/Fill Rates to 99%
• Reduce Materials Handling Staff by 50%
• Optimize the Receiving Function
What EHCR Missed

- Industry was focused on increasing the efficiency of the supply chain
- Reducing the cost of healthcare
- No reference to improving the safety of patients
How The Industry Is Changing

• Throughout the 1960s, 1970s, 1980s and 1990s the use of technology in patient care was increasing
  – Implantable devices became a routine part of the supply chain
  – These devices had a life cycle of 5 to 6 years
  – Tracking implanted devices was a manual process
• With the 21st came a rapid increase the use of technology for patient care, the devices became more complex and there has been a significant increase in the cost
  – Pacemakers expanded to AICDs
  – Lithium battery technology extended the life cycle
  – Not uncommon for patients to receive an implant device with a 15 year life cycle
Joint Commission on Accreditation of Healthcare Organizations

2005 Patient Safety Goals

• Improve the accuracy of patient identification.
• Improve the effectiveness among care givers.
• Improve the safety of using high-alert medications.
• Eliminate wrong site, wrong patient, wrong procedure surgery.
• Improve the safety of using infusion pumps.
• Improve the effectiveness of clinical alarm systems.
• Reduce the risk of healthcare acquired infections.
U.S. Food and Drug Administration Launches New Program

The Center for Devices and Radiological Health’s Postmarket Transformation Initiative will better protect the public health by allowing the FDA to identify, analyze and act on problems more quickly, including alerting the public sooner of potential medical device issues.

“Over the next decade, medical technology innovations will fundamentally transform the health care and delivery system, providing new solutions with medical devices that will challenge existing paradigms and revolutionize the way treatments are delivered,” said Scott Gottlieb, FDA’s Deputy Commissioner for Medical and Scientific Affairs.

www.fda.gov/cdrh/postmarket/mdpi.html

Source: HPN Daily Update – January 24, 2006
Center For Devices and Radiological Health
Food and Drug Administration

Post Market Tracking of Medical Devices
Question: Do checklist items TRM.3241 and TRM.31375 apply to blood filters and administration sets even if a department other than the laboratory is responsible for distributing and using these materials? For documenting the inspection and testing of materials like this, would it be sufficient to indicate that the correct stock number was received? For ongoing tracking, would it be sufficient to document the receipt of a shipment of a certain lot number and then document the use of that lot number per patient? Furthermore, how long would these records need to be retained?

Answer: A critical material is considered a good or supply used in the collection, preservation, storage, testing, or transfusion of blood components that directly affect quality or patient safety. Some examples of critical materials include reagents used for pre-transfusion testing or filters and administration sets issued by the laboratory for blood transfusion. For situations where inventory and use of critical materials bypasses the lab, the lab should have an agreement with those areas outlining the responsibility for inventory control. In addition to indicating that a correct stock number was received, a physical inspection of materials should be performed, as well as testing, if applicable, to document acceptance of receipt of new lots. The College requires that records relating to quality control be retained for five years.
Top 6 Failures in Supply Chain Management

- Failure to understand the health industry supply chain from manufacturing to the patient bedside
- Failure to understand how the health industry supply chain can improve patient safety and streamline business processes
- Failure to develop and articulate an enterprise-wide vision for supply chain management activities
- Failure to maximize the use of technology to develop a decision support system, resulting in a data rich, but information poor environment
- Failure to position the Materials Management Department as a strategic asset, acting as pro-active facilitators rather than mere functionaries
- Failure to become a clinical influencer to understand and help modify clinical supply consumption patterns
Materials Management Information System
MMIS

- Internally developed
- Caduceus Systems
- Cerner
- Dairyland
- ESI
- Infinium
- Keene

- Lawson
- McKesson
- Meditech
- Oracle
- PeopleSoft
- Other
Scanning Medications in Patient Room
Capture Data and Generate Reports (ACM & FBI) to Manage Supply and Implant Costs

- Identify total spend by vendor
- Track consumption by department
- Sort cost by surgeon
- Determine total cost & charge by DRG/Procedure
- Consider direct and indirect costs
- Analyze reimbursement – Net revenue
- Involve GPO
- Test supply costs against industry benchmarks
Reimbursement History

• Analyze payer mix
• Assess profitability by product line
  – Orthopedics
  – Neurosurgery - Spine
  – Cardiology
• Determine profitability of each physician
• Identify reimbursement for every patient
• Pursue opportunities to reduce costs
St. Alexius Ortho Primary TK and TH
Annual Dollar Spend by Company

Grand Total $ 1,920,230
Total Knee DRG 209 Median Net Gain/Loss
Annual Volume – Prospective Payment System

Surgeon

Median Net Gain / Loss

- $100

- $1,100
Total Knee DRG 209 Thursday vs. All Other Days by Physician

Annual Volume

<table>
<thead>
<tr>
<th>Physician</th>
<th>Thursday</th>
<th>All Other Days</th>
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<tr>
<td>1, N= 71,20</td>
<td>4.00</td>
<td>4.00</td>
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<tr>
<td>2, N= 9,14</td>
<td>4.00</td>
<td>4.00</td>
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<tr>
<td>3, N= 0,75</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>4, N= 2,63</td>
<td>5.00</td>
<td>5.00</td>
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<tr>
<td>5, N= 0,11</td>
<td>2.00</td>
<td>2.00</td>
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</table>
Total Knee DRG 209 Discharge by Physician

Annual Volume

Chart showing discharge volumes by type and by physician.

Physician 1, N=90
Physician 2, N=25
Physician 3, N=77
Physician 4, N=65
Physician 5, N=13

Discharge Types:
- Home Health
- Home/Self
- ICF/SNF/Swing Bed
- Rehab
Total Knee DRG 209 Median Costs by Physician

Annual Volume

Physician 1, N= 81
Physician 2, N=25
Physician, N=60
Physician, N=64
Physician 5, N=13
Autologous Blood Use by Orthopedic Surgeon

Annual Volume

<table>
<thead>
<tr>
<th>UNITS</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tr>
<td>Ordered</td>
<td>6</td>
<td>72</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Transfused</td>
<td>4</td>
<td>23</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td></td>
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</tbody>
</table>
Total Knee DRG 209 Median Costs by Physician Annual Volume
Average Implant Cost Total Knee by Physician
Baseline $5,419 for 243 patients
Total Knee DRG 209 Payer Mix
Annual Volume

Other 26%

Medicare 74%

66

190
Total Knee DRG 209 Median Severity and Length of Stay by Physician

Annual Volume

Physician 1, N=81
Physician 2, N=25
Physician 3, N=60
Physician 4, N=64
Physician 5, N=13

Severity
Length of Stay

Severity (1 to 4) or Day:

Physician 1, N=81
Physician 2, N=25
Physician 3, N=60
Physician 4, N=64
Physician 5, N=13

Severity
Length of Stay
Total Hip DRG 209 Proc 8151 Median Costs by MD Annual Volume

<table>
<thead>
<tr>
<th></th>
<th>TOTCOST</th>
<th>CSTOT</th>
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<tbody>
<tr>
<td>A, N=25</td>
<td>11684</td>
<td>6162</td>
</tr>
<tr>
<td>B, N=45</td>
<td>12681</td>
<td>6779</td>
</tr>
<tr>
<td>C, N=7</td>
<td>11486</td>
<td>6028</td>
</tr>
<tr>
<td>D, N=48</td>
<td>10656</td>
<td>6106</td>
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DRG 497 Spinal fusion with complications
Supply/Implant Costs
January 1, 2006 thru November 17, 2006

Physician A n=6
Physician B n=37
Physician C n=1
Physician D n=26
DRG 497 Spinal fusion with complications
Pharmacy Costs
January 1, 2006 thru November 17, 2006

Physician A n=6
Physician B n=37
Physician C n=1
Physician D n=26
DRG 497 Spinal fusion with complications
Laboratory Costs
January 1, 2006 thru November 17, 2006

- Physician A n=6
- Physician B n=37
- Physician C n=1
- Physician D n=26
DRG 497 Spinal fusion with complications
Radiology Costs
January 1, 2006 thru November 17, 2006

![Bar graph showing costs for different physicians.]

- **Physician A** n=6, $335
- **Physician B** n=37, $230
- **Physician C** n=1, $182
- **Physician D** n=26, $310
Spine Procedures – DRG 497, 498, 499, 500
Average Supply Cost Per Case
January 1, 2006 thru November 17, 2006
Spine Procedures – DRG 497, 498, 499, 500
Average Pharmacy Cost Per Case
January 1, 2006 thru November 17, 2006
Spine Procedures – DRG 497, 498, 499, 500
Average Laboratory Cost Per Case
January 1, 2006 thru November 17, 2006
Spine Procedures – DRG 497, 498, 499, 500
Average Radiology Cost Per Case
January 1, 2006 thru November 17, 2006
State-Of-The-Art Robotics Dispensing System
Automated Robotics Loading Rack
State-Of-The-Art Robotics Dispensing System
Automated Bar Code Packaging System
Parata Robot

- 235 highest volume tablets and capsules
- Bar code on vial to prevent filling incorrectly
- Scan bin / Scan vial – Robot accurately dispenses medication
Product Labeling Variations
Bar Coded at Box Level / Not at Unit Dose Level
Proprietary Labels
Proprietary Labels / Packaging Issue
Capture Data and Generate Reports (ACM & FBI) to Manage Supply and Implant Costs

- Identify total spend by vendor
- Track consumption by department
- Sort cost by surgeon
- Determine total cost & charge by DRG/Procedure
- Consider direct and indirect costs
- Analyze reimbursement – Net revenue
- Involve GPO
- Test supply costs against industry benchmarks
Focus on Cost and Reimbursement History

- Analyze payer mix
- Assess profitability by product line
  - Orthopedics
  - Neurosurgery - Spine
  - Cardiology
- Determine profitability of each physician
- Identify reimbursement for every patient
- Pursue opportunities to reduce costs
Today’s reasons for why standards and technology are needed

- Improve the safety and quality of patient care
- Eliminate Risk and Save lives
- Monitor the Quality of Care patients receive
- Control Medication and Supply Utilization
- Identify Cost to Every Episode of Care
- Compare Cost to Outcome
- Reduce the Cost of Health Care
- Manage Inventories (device costs are increasing)
- Access to More Data
- Strive to Achieve the EHCR Vision Goals
What’s Wrong With The Health Industry’s Supply Chain?

- Automatic Identification Technologies (bar coding and RFID) are not used to their full potential.
- Capturing data at point-of-use offers great potential to improve business processes.
- Providers have “dirty” data in their master files.
- Data is not synchronized between trading partners.
What’s Wrong With The Health Industry’s Supply Chain?

- Item master file and charge master file are not integrated.
- Manual systems and processes are unable to efficiently handle the constant change that occurs with supplies and pharmaceuticals.
- Implantable devices and medical equipment are not bar coded.
ENABLING TECHNOLOGY BENEFITS

- Quality of Patient Care
- Resource Utilization
  - Staffing
  - Medications & Supplies
  - Facilities
- Financial Performance
- Supply Chain and Benchmarking
  - Staff Productivity
  - Medication and Supply Utilization and Costs
QUALITY OF PATIENT CARE BENEFITS

• Nurses have more time to spend with patients
• Nurses are no longer involved in supply logistics
• They play a vital role in managing supply costs and there are no cumbersome processes
• Patient services aren’t delayed
• Risk Management is improved - Medication errors reduced
• Length of stay reduced
• Patient outcomes linked to cost
• Staff morale is improved
RESOURCE UTILIZATION BENEFITS

• Professional staff not involved in supply logistics
• Supply distribution tasks assigned to appropriate job classification
• Redundant manual tasks eliminated
  - 7 FTEs transitioned to other responsibilities
• Benchmarks established to measure performance
• Work activity tied to staff productivity
• Improved employee morale
RESOURCE UTILIZATION BENEFITS

- Track medication and supply expense and consumption data for patient, department and par location
- Reduce inventories
- Reduce labor costs
- Eliminate product outdates
- Fewer supplies require less space
SUPPLY CHAIN EFFICIENCY BENEFITS

- Increased productivity of receiving staff
  - Performed more work with less staff
  - Improved service levels from off-site warehouse
  - Decreased receiving errors
  - Provided greater flexibility in receiving process with RF technology
- Increased access to more data without additional staff
- Improved management reports
- Eliminated manual keyboarding and manual charting of medical record
- Access to inventory values at every nurses station
SUPPLY CHAIN EFFICIENCY BENEFITS

- Automated supply utilization/cost data capture process
- Streamlined supply distribution
  - Decreased par stock locations
  - Reduced number of restock times to par locations
  - Reduced number of items in each par location
  - Reduced stat calls by 75%
  - Improved fill rates to over 98%
- Eliminated staff time spent justifying bundled supply charges to third party payors (Workers Comp)
FINANCIAL PERFORMANCE BENEFITS

- Improved cash flow
- Reduced accounts receivable 3 - 4 days
- Decreased accounts payable cycle time
- Managed invoice terms discounts
- Reduced inventory by $2.4 million
- Converted inventory to cash
- Increased perpetual inventory turnover ratio to 14.5 turns
- Reduced medication and supply costs
  - Track medication and supply utilization/cost to every patient
  - Track medication and supply utilization/cost to every physician
Capturing Data

- Hospital Network
  - Cath Lab
  - Emergency Room
  - Radiology
  - Laboratory
  - Nursery/ICU
  - Operating Room
  - Patient Bedside

- MMIS
- General Ledger
- Clinical System
- Pharmacy
- Accounts Payable
- Patient Accounting
- Abstracting System
“Most of what we call management consists of making it difficult for people to get their work done”

Tom Peters, Author
In Search of Excellence
When you discover you are riding a dead horse, the best strategy is to dismount. That’s a no brainer.

However, in business, we often try other strategies with dead horses.

Harvey Mackay
Star Tribune
“Outswimming the Sharks”
Jan. 17, 2001
• Buying a stronger whip
• Changing riders
• Declaring that “This is the way we have always ridden this horse.”

Harvey Mackay
Star Tribune
“Outswimming the Sharks”
Jan. 17, 2001
• Appointing a committee to study the horse.
• Arranging to visit other sites to see how they ride dead horses.
• Appointing a team to revive the dead horse.

Harvey Mackay
Star Tribune
“Outswimming the Sharks”
Jan. 17, 2001
• Creating a training session to improve employees’ riding skills
• Changing the requirements, declaring “This horse is not dead.”
• Outsourcing contractors to ride the dead horse.

Harvey Mackay
Star Tribune
“Oh swimming the Sharks”
Jan. 17, 2001
• Harnessing several dead horses together for increased speed.
• Providing additional funding to increase the horse’s performance.

Harvey Mackay
Star Tribune
“Outswimming the Sharks”
Jan. 17, 2001
Mackay’s Moral:

• Don’t horse around when you’re dealing with mistakes. Get back in the saddle and grab the reins.

Harvey Mackay
Star Tribune
“Outswimming the Sharks”
Jan. 17, 2001
We are on a journey to improve the safety and efficiency of the health industry supply chain. Let’s work together and make it happen.
General Wrap Up Discussion
Questions & Answers

Thank You