Soaring to New Heights with MIDAS+ Infection Control

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**Track Session Description**

In pursuit of St. Luke's Episcopal Hospital's mission to enhance the quality of life, the Infection Control Department is committed to providing quality, affordable health care to the community we serve.

Nosocomial infections are medical complications of significant mortality, morbidity and cost. We use the MIDAS+ Infection Control module to collect, store, and transform data into information that we then use to evaluate Infection Control-related issues. This allows us to develop and implement practical measures designed to decrease nosocomial infections. In addition, we use the Focus module to store and extract relevant information for research projects.

**Post-Symposium Availability**

Shortly after the conclusion of the Symposium, most General Session and Track Session presentations will be available for viewing and downloading by licensed MIDAS+ clients from our Web site: www.midasplus.com. The presentations are available both in PDF and native Microsoft PowerPoint format.
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Objectives:
1. Describe technical configuration required to maximize Infection Control Processes
2. Describe how to merge CPT4 and ICD9 procedure codes to generate National Nosocomial Infection Surveillance System (NNIS) or National Health Safety Network (NHSN) compatible reports
3. Explain Infection Control use of ReporTrack and Indicator Profiles
4. Demonstrate use of ReporTrack for reporting of reportable conditions to City or State Health Department
5. Review the use of Focus Studies in research

St. Luke’s Episcopal Hospital
- 888-bed nonprofit primary and tertiary teaching hospital
- Home of the Texas Heart Institute: Performs approximately 1500 aortic-coronary bypasses and valve replacements annually
- A major orthopedic and neurological surgery center: Performs approximately 1500 laminectomies and fusions, and 1000 hips and knee replacements
- Affiliations with University of Texas and Baylor Medical Schools
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Technical Configurations:
- System Architectural Diagram
- ADT Interface
  - HIS McKesson STAR → Midas HL7 Interface
- DAB Interface
  - Medical Records SoftMed ClinTrac → Midas HL7 Interface
- Surgical System Interface
  - OR Software SIS → Midas Daily Batch Interface
- Lab (Microbiology) System Interface
  - LIS GE Ultra → Midas Daily Batch Interface

Technical Configurations (cont):
- Future Interfaces
  - Blood & Blood Tests (Inbound)
  - Pharmacy (Inbound)
  - Cost Accounting (Inbound)
  - Press-Gainey (Inbound)
  - Nursing Documentation (Outbound)
  - Physician Portal (Outbound)
  - Electronic Health Record (Outbound)

System Architecture:
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ADT Interface:
- Capturing the patient admission information in "real-time"
- Allocate enough resources and time when implementing to ensure data accuracy

ADT Interface: Infection Control Applications
- Patient demographics
- Patient address
- Patient contact information
- Patient admit source
- Merged with Infection related data
- are then utilized...........

.............to provide data in an electronic format for
- research data analysis
- reports of reportable conditions to City and State Health Departments.
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DAB Interface:
- Captures patient discharge information in “real-time” (as coded)
- We normally do not do concurrent coding
- More the better

DAB Interface: Infection Control Application
- ICD9 procedure codes are needed for calculating NNIS/NHSN procedure risk scores
- Patient severity scores offers a comparative look at the association between infections and patient severity

Surgical Interface:
- Daily batch interface
- Capture additional information in extended user fields such as case class and material name for investigative purposes
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Surgical Interface: Infection Control Application
- Captures CPT4 procedure codes
- Provides ASA scores, surgical wound class, and duration of surgery necessary to produce NNIS/NHSN score

Lab Interface:
- Uses an Encounter Focus
- 214,000 record limitation for viewing through the Focus screen
- Captures micro and non-micro test results for data mining

Keys for Success:
- Reliable Infrastructure (redundant servers, network, and wireless access points; all on battery back-up)
- Wireless capabilities throughout our facilities
- Customer leads within each area are our first level of support
- Customers are involved in choosing the product and all design/development stages to ensure business needs are met and we have buy-in by all
- Allocated enough resources and time to thoroughly build and test each interface
- Work closely with Midas Project Manager and Support Staff
NNIS/NHSN Risk-Stratification Model
(CDC Guidelines)

- Surgical procedures categorized into procedure groups
- Risk scores assigned based on ASA scores, wound class, and duration of surgery:

<table>
<thead>
<tr>
<th>ASA SCORE:</th>
<th>ASA score 1 and 2</th>
<th>ASA score 3, 4, 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no points added</td>
<td>1 point added to risk score</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WOUND CLASSIFICATION:</th>
<th>Clean (class I)</th>
<th>Clean-contaminated (class II)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no points added to risk score</td>
<td>no points added to risk score</td>
</tr>
</tbody>
</table>

| Contaminated (class III)   | 1 point added to risk score |
|                            | Dirty (class IV)          |

<table>
<thead>
<tr>
<th>DURATION OF OPERATION (Cut Time):</th>
<th>Time varies with procedure categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex. CARD</td>
<td>&gt;5 hours 1 point added to risk score</td>
</tr>
</tbody>
</table>

CPT4 and ICD9 Merging Process:
6 Steps

1. Confirm CPT4 and ICD9 procedure codes match (consult expert coders and books as needed)
2. Establish MIDAS+ Surgical Procedure Risk Groups (MIDAS+ Dictionary)
3. Assign CPT4 procedure codes to Surgical Procedure Risk Groups (MIDAS+ Dictionary)
4. Assign cut time to Surgical Procedure Risk Groups (MIDAS+ Dictionary)
5. Compile "NNIS Recomputation" function
6. Utilize indicator definitions of count, sum, and rate to generate NNIS/NHSN reports
CPT4 and ICD9 Merging Process

2. Establish MIDAS Surgical Procedure Risk Groups (Midas Dictionary)

3. Assign CPT4 procedure codes to Surgical Procedure Risk Groups (Midas Dictionary)

4. Assign cut time to Surgical Procedure Risk Groups (Midas Dictionary)
5. Compile "NNIS Recomputation" function (System Manager Function)

6. Utilize indicator definitions of count, sum, and rate as needed to generate NNIS/NHSN reports

Sample MIDAS+ generated risk-stratified NNIS/NHSN compatible report:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Jan 2009</th>
<th>Feb 2009</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>E_CARE0:3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>E_CARE1:4</td>
<td>2</td>
<td>31</td>
<td>33</td>
</tr>
<tr>
<td>E_CARE1:4</td>
<td>0</td>
<td>226</td>
<td>226</td>
</tr>
<tr>
<td>E_CARE1:4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>E_CARE2:4</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>E_CARE2:4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Data simulation
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CPT4 and ICD9 Merging Process

Sample NNIS/NHSN compatible report transformed:

<table>
<thead>
<tr>
<th>Operative Procedure Category</th>
<th>Risk Index</th>
<th>No. of Infections</th>
<th>Total Cases</th>
<th>Rate 10%</th>
<th>Rate 25%</th>
<th>Rate 50%</th>
<th>Rate 75%</th>
<th>Rate 90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHA (Valve Surgery)</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>1.0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>CBGB (ACB with I.M. Graft)</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td>1.0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>CBGC (ACB Chest Only)</td>
<td>1</td>
<td>50</td>
<td>100</td>
<td>0.5</td>
<td>0.28</td>
<td>0.56</td>
<td>0.84</td>
<td>1.00</td>
</tr>
</tbody>
</table>

CPT4 and ICD9 Merging Process

Keys for Success:
1. Assign a procedure risk category to all targeted surgical site infections (Numerator Count Indicator)
2. Make sure all targeted procedures are ICD-9 coded and have a correlating procedure risk category assignment before running infection rates reports (Denominator Count Indicator)
3. Convey significance of accurate coded information (CPT4 and ICD9 procedure codes) to expert coders.

Infection Control Use of ReporTrack

1. Correct Coding problems
2. Produce Infection Control report summaries
3. Report reportable conditions to City and State Health Departments
4. Utilization of Midas “current length of stay” function to assist with process improvement activities
5. Store and retrieve data for research projects and data analysis
Infection Control Use of ReporTrack (cont.)
Sample report used to correct coding problems

Infection Control Use of ReporTrack (cont.)
Sample of Infection Control report summary

Infection Control Use of ReporTrack (cont.)
Sample Infection Control Report Summaries: Data Transformed

NOSOCOMIAL PNEUMONIA IN THE ICUs
Percent Pathogens

Data simulation
Infection Control Use of ReporTrack (cont.)

Sample quality improvement process report

Infection Control Use of ReporTrack (cont.)
Reportable conditions entered into Midas as an IC episode

Infection Control Use of ReporTrack (cont.)
In ReporTrack/Record Selection/ Reportable Column Select “Y”
Infection Control Use of ReporTrack (cont.)
A worksheet is generated for faxing to City Health Department

Infection Control Use of ReporTrack (cont.)
Sample: Quarterly VRE and resistant Strep. Pneumo report

Infection Control Use of ReporTrack (cont.)
Research Project: Sample Patient census report from ReporTrack
Research data entered into Midas Focus Module

Cumulative data display in html format allows more data to be collected in a single ReporTrack report

Html preview of data collected

This data can be exported to Excel for ease of statistical analysis
Infection Control Use of Indicator Profiles

1. Capture infection rates in graphic formats
2. Profile unit-specific infection rates
3. Provide surgeon-specific infection rates
4. Future use of count and rate indicators for data mining

Infection Control Use of Indicators & Profile (cont.)

Graphic display of infection rates

Infection Control Use of Indicators & Profile (cont.)

Unit-specific infection rate profile

Data simulation
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**Keys for Success:**

1. Data output is only as good as data input.
2. A monthly ReporTrack report is vital to ensure accuracy of data including a check for missing CPT4 procedure codes.
3. Agents of reportable diseases should be entered into the focus module at the **patient level** to avoid duplication.

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