Infection Control: Meeting the Challenge

Wednesday, June 5, 2:30 pm

The data demands placed on Infection Control departments have significantly increased and new regulatory requirements continually surface. These can be complex and are often labor-intensive to satisfy. The Midas+ Care Management Infection Control Subsystem can help to minimize the reporting and data collection burden. This session will provide an overview of the use of the Infection Control Subsystem for clients with and without clinical interfaces. In addition to reporting capabilities, a high-level review of the use of the Midas+ Toolkits for Infection Control will also be provided.

Presented By:
Susan Hamstra, Manager, Midas+ Solutions Consulting
Today’s Session

The data demands placed on Infection Control departments have significantly increased and new regulatory requirements continually surface.

These can be complex and are often labor-intensive to satisfy. The Midas+ Care Management Infection Control Subsystem can help to minimize the reporting and data collection burden.

This session will provide an overview of the use of the Infection Control Subsystem for clients with and without clinical interfaces.

In addition to reporting capabilities, a high-level review of the use of the Midas+ Toolkits for Infection Control will also be provided.
Today

- Infection Control without Ancillary Interfaces
  - Ease of data entry
  - Time saving (~Reporting)

- Infection Control with Ancillary Interfaces
  - Power of Integration
  - Alerts
  - Population of module fields
  - Drug/Bug interactions
  - Antimicrobial Stewardship
  - Regulatory data submission

Acronyms in Infection Control

- HAI  Healthcare Associated Infection
- IP  Infection Preventionist
- IC  Infection Control
- CDC  Centers for Disease Control
- NHSN  National Healthcare Safety Network (Data Warehouse)
- CMS  Centers for Medicare & Medicaid Services
- SSI  Surgical Site Infection
- CLABSI  Central Line Associated Blood Stream Infection
- CAUTI  Catheter Associated Urinary Tract Infection
- MDRO  Multiple Drug Resistant Organism
- C. Diff  Clostridium Difficile
- MRSA  Methicillin Resistant Staph Aureus
- VRE  Vancomycin Resistant Enterococcus
Infection Control Today

- Surveillance
- Investigation
- Data collection
  - Internal/External
- Reporting
  - Internal/External
  - Regulatory
    - NHSN
    - Regional
    - Local – Health Department

Surveillance

- First step of Infection Preventionist (IP) work
  - Targeted vs. Whole House Surveillance
    - Targeted: Specific organisms/diagnostics or tests/cultures
    - Whole House: Monitoring of all possible infections

- Without Clinical Interfaces
  - Multiple data sources
    - Lab Reports, Surgery Schedules
    - Referrals

- With Clinical Interfaces
  - Cultures w/organisms
  - Drug/Bug Interactions
  - Positive Antigens – C Difficile
  - Utilization of Specific Antimicrobials
Investigation

- Trigger identified
  - Culture with organism
  - Positive Nares Screening
  - Readmit with diarrhea
  - Fever Unknown Origin (FUO)
  - Readmit with recent OR procedure

IP investigates

- Determines if the event meets Infection Criterion based on CDC, State or Local reporting requirements.
- If “meets” begins data collection of necessary data elements for reporting

Data Collection (Regulatory Reporting and Performance Improvement Efforts)

Event Details

- Clinical data
  - Organism and susceptibilities
  - Criterion for inclusion
  - Date of onset
  - HAI vs. Community Acquired
  - Symptomology

- Demographic data
  - Name, DOB, Age
  - Residence
  - Employment
Reporting

- Federal
  - CMS Mandated
  - CDC Defines
  - NHSN Collects
- State
- Local – Health Department requirements
- Internal - Strategic Initiatives

Internal Reporting

- Regulatory data plus:
  - Infection Rates
  - HAI Rates
  - Outbreak Monitoring
  - Physician Level Data for OPPE
  - Ventilator Associated Pneumonia
  - Prevalence of specific organisms
- Data Supporting Performance Improvement efforts
Infection Control

- without ancillary interfaces

- Data entry into an Excel spreadsheet(s) or ?
  - Requires entry of demographic data
  - Opportunity for a corrupted spreadsheet
  - Manual process for data summary (graphs and reports)
  - Labor and resource intensive

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Decreases data entry on Excel sheet - no need for Demographic info to be captured
Infection Control Entry – Pt Look Up

Function > Infection Control Entry > Infection Entry

Infection Control Entry – 3 Required Fields
Reporting from Required Fields (3)

+1 - Add one more field: Organism
Reporting- 3 Required Fields +1

+1 - Add one more field: Infection
Reporting- 3 Required Fields +1+1=5

Plus: Organism specific data

Plus: Rates

Plus: Patient Tracking List

+1 more?
Filter by Organisms or Culture Source

Report Data Transfer

Midas+ allows you to take the data captured in an indicator, and transfer it along with all associated demographic data into an Excel Spreadsheet, where it can be further manipulated.

<table>
<thead>
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<th>Patient Name</th>
<th>MRN</th>
<th>Age</th>
<th>Sex</th>
<th>LOS</th>
<th>Start Dt</th>
<th>End Dt</th>
<th>DRG</th>
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<th>DX2</th>
<th>DX3</th>
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<td>M</td>
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<td>4/30/2011</td>
<td>475</td>
<td>510.8 EMPIEIMA W/O FISTULA</td>
<td>427.31</td>
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<td>24008427</td>
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<td>85</td>
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<td>5/13/2011</td>
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<td>197.7 SECOND MALIG NEO LIVER</td>
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<td>3/15/2011</td>
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<td>M</td>
<td>5</td>
<td>1/4/2011</td>
<td>1/15/2011</td>
<td>444</td>
<td>199 MALIG NEO DISSEMINATED</td>
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<tr>
<td>24020679</td>
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<td>512336</td>
<td>93</td>
<td>M</td>
<td>6</td>
<td>3/10/2011</td>
<td>3/15/2011</td>
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<td>428 CONGESTIVE HEART FAILURE</td>
<td>496</td>
<td>444</td>
<td></td>
</tr>
</tbody>
</table>
**Document Generation – Reportable Events**

ILLINOIS STATE DEPARTMENT OF HEALTH
DIVISION OF EPIDEMIOLOGY

CONFIDENTIAL CASE REPORT

Patient Name: Test, Test Mode
Maiden: __________________

Phone No: 123-456-7890
Work: 123-456-7895

Address: 123 Main Street
City: Decatur
Zip code: 69999
Date of Birth: 01/01/1985
Age: 25

Occupation Setting: __________
Pregnant: N

Race/Ethnicity: White
Sex: M

Hospitalized? Yes
Admission Date: 11/22/2010
Discharge Date: __________________

Name of Hospital: Midas Medical Center
Chart #: 12345678

Disease: Chlamydia trachomatis infection
Site of Infection: Eye

Date of First Symptoms: 12/04/2010
Date of Diagnosis: 12/16/2010
Date of Report: 1/4/2011
Date of Death: __________

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**Document Generation – Letters**

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**Document Generation – Ease of Data Entry**

![Surgical Site Infection (SSI) Form](image1)

**Historical Data – Patient Explorer**

![Patient Explorer Interface](image2)
Infection Control - **without** ancillary interfaces

- Data entry into Midas+ vs an Excel spreadsheet can save the IP time
- No entering of demographic data
- No opportunity for a corrupted spreadsheet
- Ease of defining the fields necessary for the reports

### MRN System

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Age</td>
<td>System</td>
<td>Admit Date/Time</td>
<td>Name</td>
<td>Address</td>
<td>DOB</td>
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<tr>
<td>Attribution Location</td>
<td>System</td>
<td>Date of Onset</td>
<td>System</td>
<td>System</td>
<td>System</td>
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<tr>
<td>Organism</td>
<td>Enter</td>
<td>Required</td>
<td>Infection Location</td>
<td>Required</td>
<td>Type</td>
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<tr>
<td>Reportable</td>
<td>Check box</td>
<td>Room</td>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Getting Started**

Infection Control - **with** Ancillary Interfaces

Review Current Reports
Clinical Decision Support
Alerts-Documentation-Reporting

Available Ancillary Interfaces:
- Lab
- Micro
- Blood Bank
- Pharmacy
- Surgery
- OB/Neonatal
- Orders
- Financial
- Clinic

Clinical Integration:
Consider Other Departments

Interfacing of:
- Laboratory Data
- Microbiology
- Laboratory
- Blood Bank
- Pharmacy Data
- Surgery Data

For use by:
- Infection Control
- Quality
- Risk
- Case Management
- Patient Safety
- Laboratory
Surveillance - with Ancillary Interfaces

- Cultures with Organisms
  - Blood Cultures
  - Wound Cultures
  - Sputum Cultures
  - Urine Cultures

- Specific Organisms
  - Acinetobacter
  - Klebsiella Pnuemoniae
  - Carbapenem-resistant Enterobacteriaceae

- Diagnostic Test
  - Lumbar puncture on a child
  - Reactive or Positive C Diff Antigen

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Surveillance - with Ancillary Interfaces

- PTL - History of MRSA – Colonized
- VRE-Vancomycin Resistant Enterococcus
- Norovirus
- Drug/Bug Interactions
  - Vancomycin administered/Organism resistant
- Specific Procedures
- Specific Diagnostic Exams or Tests (Lumbar Puncture)
- Specific Medications administered
- Postop Pt with Glucose > 200
Paper to Automated Worklist

Moving paper and/or manual processes to automated notifications or alerts.

Surveillance Activities become automated.

• NO More:
  • Reviewing pages of Microbiology and Laboratory Reports
  • Review OR schedule daily

Laboratory Data Interface
Worklist-driven Notifications

Double Click From Culture w/ organism (Micro) Worklist
Results Tab-General

Results Tab-Organisms
Results Tab-Interface Transaction

Results Tab – Prompt and Response
Attach & Import – Creates Infection Event

More than one culture

Results Imported – Infection Event
IP Documents Clinical Findings

Historical Data – Patient Explorer
Non-Micro results: Chemistry, Hematology & Serology to Focus

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Test Results</th>
<th>Numerical Results</th>
<th>Reference Range</th>
<th>Unit of Measure</th>
<th>Status</th>
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<tr>
<td>GLUCOSE</td>
<td>120</td>
<td>120</td>
<td>70-110</td>
<td>mg/dl</td>
<td>high</td>
</tr>
<tr>
<td>CREATinine</td>
<td>2.4</td>
<td>2.4</td>
<td>0.6-1.3</td>
<td>mg/dl</td>
<td>high</td>
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<tr>
<td>BUN</td>
<td>34</td>
<td>34</td>
<td>7-20</td>
<td>mg/dl</td>
<td>high</td>
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<tr>
<td>SODIUM</td>
<td>141</td>
<td>141</td>
<td>135-145</td>
<td>mmol/L</td>
<td>Low</td>
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<tr>
<td>POTASSIUM</td>
<td>3.4</td>
<td>3.4</td>
<td>3.5-5.5</td>
<td>mmol/L</td>
<td>Low</td>
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<tr>
<td>CHLORIDE</td>
<td>108</td>
<td>108</td>
<td>96-111</td>
<td>mmol/L</td>
<td>Low</td>
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<tr>
<td>CO2 TOTAL</td>
<td>28</td>
<td>28</td>
<td>23-32</td>
<td>mmol/L</td>
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<tr>
<td>CALCIUM</td>
<td>8.0</td>
<td>8.0</td>
<td>8.5-10.5</td>
<td>mmol/L</td>
<td>Low</td>
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<tr>
<td>KREATININ</td>
<td>2</td>
<td>2</td>
<td>0.9-1.4</td>
<td>mg/dl</td>
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<tr>
<td>EST. UREA</td>
<td>26.3</td>
<td>26.3</td>
<td>&gt;26.3</td>
<td>mg/dl</td>
<td>Low</td>
</tr>
</tbody>
</table>

Laboratory Worklist Alerts

C Difficile Antigen
Glucose > 250 mg/dl
Pharmacy Interface

![Pharmacy Interface Image]

Worklist Alerts

**Medication-specific**

**Medications**

- High Cost
- Adverse Side Effects
- Over-utilization
Antimicrobial Stewardship

- Increasing area of focus due to:
  - Increasing Drug Resistance
  - Appropriate Medication Utilization (up to 50% inappropriate)
  - Costs

- Monitors for:
  - Use of antibacterial medications for the treatment of syndromes not caused by bacteria.
  - Treatment of culture results that reflect colonization or contamination rather than infection.
  - Administration of broad spectrum antibiotics where narrow spectrum agents are equally effective.
  - Prescription of antibacterial therapy courses that are longer than necessary.
  - Prescribing of antibacterial agents at inappropriate doses.
Drug/Bug Notifications

Medication Ordered/administered

Organism-resistant

Historical Information
Surgery Worklists

Readmission with previous inpatient encounter with surgery entry.
Historical Data – Patient Explorer

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Reporting- 3 Required Fields + 1 + 1 = 5

Plus: Organism specific data
Plus: Rates
Plus: Patient Tracking List

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Reporting – Adding Surgery data

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<tr>
<th>Indicator</th>
<th>Jan 2011</th>
<th>Feb 2011</th>
<th>Mar 2011</th>
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<td>3</td>
<td>3</td>
<td>7</td>
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<tr>
<td>SSI Deep Incision Deep Infiltrated SSI</td>
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<td>0</td>
<td>1</td>
<td>2</td>
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<tr>
<td>SSI Superficial Incision Deep Infiltrated SSI</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Total HAIs by Wound Class</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>P1 – Clean</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>P1 – Clean-Contaminated</td>
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<tr>
<td>P1 – Contaminated</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>P2 – Primary SSI – Class 1 – Clean</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>P2 – Primary SSI – Class 4 – Dirty/Infected</td>
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Surgery Data

Reporting – Physician Level Data

This is at the level of Diagnostic Exam, does not require an infection event.
Reporting

Report Data Transfer

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Reporting – Coded Data

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Toolkits for Infection Control

CLABSI and CAUTI (MDRO & C. difficile)

SSI-Surgical Site Infections
NHSN CLABSI/CAUTI Toolkit

Concept

- Beginning in January of 2011 CMS implemented a mandatory reporting requirement for central line-associated bloodstream infections (CLABSI) through the National Healthcare Safety Network (NHSN).
- On January 1, 2012, CMS implemented a mandatory reporting requirement for catheter-associated urinary tract infections (CAUTI) through NHSN.
- The toolkit supports Care Management users in the collection and extraction of CLABSI and CAUTI data to meet these mandatory requirements with electronic data submission.

Components

- An encounter-level Focus Study that gathers the CLABSI and CAUTI event data.
- A process-level Focus Study that gathers in a single form, denominator information for all reporting locations.
- A process-level Focus Study for mapping facility locations to those defined by NHSN.
- A set of dictionaries that supply the terms and associated codes that match those terms to those from NHSN.
- A standard report which generates a data extraction file suitable for upload to NHSN.
NHSN CLABSI/CAUTI Toolkit

Infection Control: Meeting the Challenge

NHSN CLABSI/CAUTI Toolkit

Infection Control: Meeting the Challenge
NHSN CLABSI/CAUTI Toolkit

Future Directions

- Midas+ is currently working on adding MDRO/CDI and LabID reporting abilities to the CLABSI/CAUTI Toolkit.
- Midas+ will continue to monitor CDC reporting requirements and evaluate the feasibility of further expansion of this toolkit.

NHSN SSI Reporting

Concept

- Starting in January of 2012 CMS implemented a mandatory reporting requirement for surgical procedures and SSI through the NHSN.
- To assist clients in reporting Midas+ created the SSI toolkit to leverage the surgery and infection control modules within Care Management.
- The toolkit allows for the collection of surgical procedure data from the surgery module and infection information from the infection control module.
- The goal of the toolkit is to allow the collection of all procedure data through the surgery interface, without the interaction of a user. Infection information requires Infection Preventionist review and approval for submission.
NHSN SSI Reporting

Components

- User fields within the Surgery module collect procedure information. These fields are updated through the surgery interface.
- User fields within the Infection Control module collect infection information. These infections are linked through standard functionality to the attributable surgical procedure in the surgery module. This linkage is communicated through the toolkit to NHSN.
- A standard report which creates the files necessary for upload to NHSN. These files contain both the procedures and infections.
- A process focus study called the Mapper which allows for the declaration of which surgical procedure groups will be reported and allows for mapping your terms to NHSN terms when they are received through the interface.
- Distributed Dictionaries for NHSN data collection.
Infection Control User Fields – Infections

NHSN SSI Reporting

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NHSN SSI Reporting

Infection Control User Fields – Infections

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NHSN SSI Reporting
Infection Control User Fields – Infections

NHSN SSI Reporting
Process Focus Study – Mapper
**NHSN SSI Reporting**

**Future Directions**

- Midas+ values client feedback on the toolkit and uses that feedback to make improvements.
- As NHSN improves their reporting process the toolkit will be updated as well.

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**Thank you for attending.**

**Questions?**

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