TAP into Quality
Using NHSN to Reduce *Clostridium difficile* Infections

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Hospital Quality Project Lead
Health Services Advisory Group
Presentation Outline

• Health Service Advisory Group (HSAG): The new Ohio Quality Innovation Network-Quality Improvement Organization (QIN-QIO)
• The Centers for Medicare & Medicaid Services (CMS) contractor changes
• Annual percentage update (APU), value-based purchasing (VBP), and healthcare-associated infection (HAI) changes for reporting year 2015
• Key Steps to Successful Data Reporting
• Driving Quality with National Healthcare Safety Network (NHSN) Reports
• Targeted Assessment for Prevention (TAP) Reports
What is a QIN-QIO?

- Funded by CMS
- Tasked with implementing the National Quality Strategy
  - Safer care
  - Ensure patient and family engagement
  - Support coordination of care
  - Advocate for disease prevention
  - Promote best practices of healthy living
  - Make care affordable
HSAG is the Medicare QIN-QIO for Arizona, California, Florida, Ohio, and the U.S. Virgin Islands.

Nearly 25 percent of the nation’s Medicare beneficiaries
Quality Innovation 
Network-Quality 
Improvement 
Organization (QIN-QIO)
Coordinate with providers 
and communities on 
data-driven quality 
initiatives.

Beneficiary and Family-
Centered Care Quality 
Improvement 
Organization (BFCC-QIO)
Field quality-of-care 
complaints and appeals.

Value, Incentives, and 
Quality Reporting (VIQR) 
Support Contractors 
Help providers report 
quality measure data.
A Business Case For HAI Quality
Definition Check

- **APU**: Annual Percentage Update  
  (Pay to participate)
- **VBP**: Value-Based Purchasing  
  (Pay for performance)
- **HACs**: Hospital-Acquired Conditions
- **PSI 90**: Patient Safety Indicators
8% at risk
## VBP Program FY 2017 Standards: Safety Domain

<table>
<thead>
<tr>
<th>Measure ID</th>
<th>Description</th>
<th>Achievement Threshold</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUTI</td>
<td>Catheter-associated urinary tract infection</td>
<td>0.845</td>
<td>0.0000</td>
</tr>
<tr>
<td>CLABSI</td>
<td>Central line-associated blood stream infection</td>
<td>0.457</td>
<td>0.0000</td>
</tr>
<tr>
<td><em>C. difficile</em></td>
<td><em>Clostridium difficile</em> infection (CDI)</td>
<td>0.750</td>
<td>0.0000</td>
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<tr>
<td>MRSA bacteremia</td>
<td>Methicillin-resistant <em>Staphylococcus aureus</em> bacteremia</td>
<td>0.799</td>
<td>0.0000</td>
</tr>
<tr>
<td>PSI-90</td>
<td>Complication/patient safety for selected indicators (composite)</td>
<td>0.777936</td>
<td>0.547889</td>
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<tr>
<td>SSI</td>
<td>Surgical site infection</td>
<td>0.751</td>
<td>0.0000</td>
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<tr>
<td></td>
<td>Colon</td>
<td>0.698</td>
<td>0.0000</td>
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<tr>
<td></td>
<td>Abdominal hysterectomy</td>
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</table>
### Table 1. AHRQ PSI Composite Measure

<table>
<thead>
<tr>
<th>Patient Safety for Selected Indicators (PSI #90)</th>
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<tbody>
<tr>
<td>PSI #03 Pressure Ulcer Rate&lt;sup&gt;1&lt;/sup&gt;</td>
<td>PSI #11 Postoperative Respiratory Failure Rate</td>
</tr>
<tr>
<td>PSI #06 Iatrogenic Pneumothorax Rate&lt;sup&gt;1&lt;/sup&gt;</td>
<td>PSI #12 Postoperative Pulmonary Embolism or Deep Vein Thrombosis Rate&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td><strong>PSI #07 Central Venous Catheter-Related Blood Stream Infection Rate</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>PSI #13 Postoperative Sepsis Rate&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>PSI #08 Postoperative Hip Fracture Rate&lt;sup&gt;1&lt;/sup&gt;</td>
<td>PSI #14 Postoperative Wound Dehiscence Rate&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>PSI #09 Postoperative Hemorrhage or Hematoma Rate</td>
<td>PSI #15 Accidental Puncture or Laceration Rate&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>PSI #10 Postoperative Physiologic and Metabolic Derangement Rate</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> These measures are part of the NQF Endorsed Composite (i.e., PSI #90, NQF: #531).

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**CLABSI has a double impact!!!**

**Counts as a separate HAC and part of PSI composite**
Key Steps to Successful CMS Reporting with NHSN
Reporting Requirements According to CMS Specifications

**CMS Supporting Materials**

- Healthcare Facility HAI Reporting Requirements to CMS via NHSN Current and Proposed Requirements [PDF - 119 KB] September 2013
- Reporting Requirements and Deadlines in NHSN per CMS Current Rules [PDF - 154 KB] September 2013
- Centers for Medicare and Medicaid Services (CMS) Hospital Inpatient Quality Reporting Program
- CMS’ Hospital Compare tool
- Operational Guidance for Acute Care Hospitals to Report Central Line-Associated Bloodstream Infection (CLABSI) Data to CDC’s NHSN for the Purpose of Fulfilling CMS’s Hospital Inpatient Quality Reporting (IQR) Requirements [PDF - 108 KB] August 2012
- How to Report No CLABSI Events for the CMS Inpatient Quality Reporting Program [PDF - 274 KB] June 2012
- Helpful Tips for CLABSI Reporting for the Centers for Medicare and Medicaid Services’ Hospital Inpatient Quality Reporting Program (CMS Reporting Program) [PDF - 294 KB] September 2012
Keys to Successful NHSN Reporting

- Monthly Reporting Plan
- Summary Data
- No Events/No Procedures
- CMS Inpatient Prospective Payment System (IPPS) Reports
Monthly Reporting Plan for CMS Required Data

- Drives what is reported to CMS
- Drives alerts
- Created based on CMS reporting requirements
  - CLABSI: Intensive Care Unit (ICU) and Medical/Surgical Ward
  - CAUTI: ICU and Medical/Surgical Ward
  - MRSA: FacWideIN (Blood Specimen)
  - CDI: FacWideIN (All Specimen)
  - SSI Colon and Hysterectomy: In Patient
<table>
<thead>
<tr>
<th>Location</th>
<th>Specific Organism Type</th>
<th>Process and Outcome Measures</th>
<th>Infection Surveillance</th>
<th>AST-Timing AST-Eligible Incidence Prevalence</th>
<th>Lab ID Event</th>
<th>Blood Specimens Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAC-WIDEIn - Facility-wide Inpatient (FacWIDEIn)</td>
<td>MRSA - MRSA</td>
<td>Process and Outcome Measures</td>
<td>Infection Surveillance</td>
<td>AST-Timing AST-Eligible Incidence Prevalence</td>
<td>Lab ID Event</td>
<td>Blood Specimens Only</td>
</tr>
<tr>
<td>REHAB - REHAB UNIT</td>
<td>MRSA - MRSA</td>
<td>Process and Outcome Measures</td>
<td>Infection Surveillance</td>
<td>AST-Timing AST-Eligible Incidence Prevalence</td>
<td>Lab ID Event</td>
<td>Blood Specimens Only</td>
</tr>
</tbody>
</table>

MRSA & CDI LabID Event Reporting for the Acute Care Facility

MRSA & CDI LabID Event Reporting for the IRF Unit
CMS IPPS Reports

• “Snap shot” of what is being submitted on your behalf to CMS
• Validation of your submission
• Only proof your data was entered prior to the deadline
• Means to verify data accuracy
• Every submission...Every time!
Needs to be Done for Every Report, Every Time

Analysis → Output Options → CMS Reports → Acute Care Hospitals (Hospital IQR) → CDC Defined Output

Select modify
Keys to Successful NHSN Reporting

Change to “SummaryYM” to display report by month
Do Not Just Run It...Validate It Too!

National Healthcare Safety Network
SIR for CAUTI Data for CMS IPPS - Overall
As of: March 26, 2015 at 2:17 PM
Data Range: CAU_RATEES_CMS_summaryYM 2014M01 to 2014M03

<table>
<thead>
<tr>
<th>summaryYM</th>
<th>infCount</th>
<th>numExp</th>
<th>numucathdays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>SIR95CI</th>
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</thead>
<tbody>
<tr>
<td>2014M01</td>
<td>102</td>
<td>92.807</td>
<td>45410</td>
<td>1.098</td>
<td>0.3700</td>
<td>0.600, 1.327</td>
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<tr>
<td>2014M02</td>
<td>104</td>
<td>80.767</td>
<td>39267</td>
<td>1.288</td>
<td>0.0147</td>
<td>1.057, 1.554</td>
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<tr>
<td>2014M03</td>
<td>76</td>
<td>84.899</td>
<td>41190</td>
<td>0.894</td>
<td>0.3305</td>
<td>0.700, 1.113</td>
</tr>
</tbody>
</table>

If infCount in this table is less than you reported, aggregate data are not available to calculate numExp.
Lower bound of 95% Confidence Interval only calculated if infCount > 0. SIR values only calculated if numExp >= 1.
SIR excludes those months and locations where device days are missing.
Applicable ward-level data included for 2015 and forward only, per CMS IPPS requirements.
Beginning January 2015, the CAUTI definition excludes all non-bacterial pathogens and therefore, the number of CAUTIs reported in 2015 and forward may be lower than in previous years.

Data contained in this report were last generated on March 26, 2015 at 2:17 PM.
NHSN New Baseline Coming!

• 2015 will serve as new baseline year
• All NHSN measures
• Related to new definitions
  – 2015 increase in CLABSI Rates
  – 2015 decrease in CAUTI Rates
• Will go into effect for the 2016 calculations
Driving Quality With NHSN Reports
Be Aware of Your Denominator Size

- Smaller volumes must increase the date range
- Can use line lists to show all HAIs
- Some calculations need a larger population
- Based on statistical significance
- Algorithms to “risk-adjust” require a large enough population to make “inferences”

Tip for smaller hospitals:
You may want to look at all device-associated events or all procedure-associated events to create a large enough population for statistical analysis.
Reminder: Always Generate a New Dataset Before Running Any Reports

Generate Data Sets

Generate Patient Safety Analysis Data Sets

Datasets generated will include data for which rights have been conferred and include the 3 most recent full calendar years up until today’s date for the Patient Safety Component. To include all years check the box below.

For all other components, datasets generated will include all years within the context of rights conferred. Note that any analysis options you run will be limited to the time period shown on the data range bar.

- Include all data reported to NHSN for this component within the parameters of rights conferred.

1/2012 – 3/2015

Generate Now

Last Generated: Mar 26 2015 2:17PM
Line Lists
Line Lists

• Allows for record-level review of data
• Useful for data validation or troubleshooting
• Available for each measure
  – Device Associated
  – Procedure Associated
  – MDRO/CDI LabID

• Available for all HAIs

Good option for smaller hospitals
The parameter selected for “Date Variable” can significantly impact your output.

CMS = Discharge Date
NHSN = Specimen Date
Line Listing for LabID Event: CDI All Events

Select “Modify” for “Line Listing”

“Export Output Data Set” to open in Excel format
CDI Line Listing

<table>
<thead>
<tr>
<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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<th>I</th>
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</tr>
<tr>
<td>2</td>
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<td>N</td>
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<td>1/9/2014</td>
<td>1/15/2014</td>
<td>STOOL</td>
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<tr>
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<td>2MS</td>
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<td>N</td>
<td>CO-HCFA</td>
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<td>N</td>
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<td>HO</td>
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<td>1/23/2014</td>
<td>STOOL</td>
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<td>Y</td>
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<td>3/10/2014</td>
<td>STOOL</td>
<td>3/14/2014</td>
<td>1</td>
</tr>
</tbody>
</table>

No Unit Level standardized infection ratio (SIR) for LabID Events
Use Line Listing to determine raw infection counts to analyze prevalence
Customizing LabID Line Listing Reports

Select “Modify List”

Add/remove any variables within the table to customize your report
Standardized Infection Ratio (SIR) Reports
What Is The SIR?

“The standardized infection ratio (SIR) is a summary measure used to track HAIs at a national, state, or local level over time. The SIR adjusts for patients of varying risk within each facility.” (NHSN Newsletter; 12/2010)

- O/E Ratio
- Observed number of events/Expected number of events
- Expected is a risk-adjusted number
- Methodology based on Standardized Mortality Ratio (SMR)
- SIRs are calculated only if the number of expected HAIs (numExp) is ≥1
- SIR = 1.0 means number of observed events = number of expected events
"In-Plan" shows SIR for only what is in Monthly Reporting Plan

"All" shows SIR for all events for that particular measure

Based on the CMS criteria

SIR used for VBP
SIR Options: Report Results Breakdown

• Overall SIR
• SIR for each location group (e.g., all ICUs and Wards [non-neonatal intensive care unit or specialty care unit] combined)
• SIR for each CDC location type (e.g., all Surgical ICUs combined)
• SIR for each individual location (e.g., 22ICU)
P-Value

*Calculated probability is the estimated probability of rejecting the null hypothesis (H0) of a study question when that hypothesis is true. <0.5 = Statistically different.*

95% Confidence Interval (CI)

*Range of values where the true SIR is thought to lie. Determines significance, accuracy, and precision of SIR. If includes value of 1, then NOT statistically different.*
95% Confidence interval (CI) interpretation for statistical significance

Yes

No (crosses 1)

No (crosses 1)

Yes

SIR
SIR Report Interpretation

<table>
<thead>
<tr>
<th>Summary Yr</th>
<th>Infection Count</th>
<th>Number Expected</th>
<th>Central Line Days</th>
<th>SIR</th>
<th>SIR p-value</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>9</td>
<td>7.191</td>
<td>3786</td>
<td>1.25</td>
<td>0.2962</td>
<td>0.653, 2.184</td>
</tr>
</tbody>
</table>

**Observed infections = 9**
**Expected based on calculation = 7.191**
**SIR = 1.25**
**P-value = 0.2962**
**CI = 0.653, 2.184**

*Fictitious Data*
The observed infections were greater than the expected and the SIR is greater than 1.0. The p-value and CI indicates that the number of observed infections is **NOT** significantly different than the number of expected.
Rate Tables
CDI Rate Tables—Prevalence Rates

National Healthcare Safety Network
Rate Table - All CDI LabID Events by Location
CDI Prevalence - Inpatient CDI Admission Prevalence Rate
As of June 19, 2015 at 7:50 AM
Date Range: LABID_RATE ECDIF summary yr: 2014 to 2014

<table>
<thead>
<tr>
<th>summaryYr</th>
<th>months</th>
<th>location</th>
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<th>numadms</th>
<th>CDIF_admPrevRate</th>
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<tbody>
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<td>FACWIDEIN</td>
<td>79</td>
<td>10098</td>
<td>0.782</td>
</tr>
</tbody>
</table>

For 2015 and forward, FACWIDEIN excludes LabID events reported for rehabilitation wards and behavioral health/psych wards that have a CCN that is different from the acute care hospital.

Source of aggregate data: Not available
Data contained in this report were last generated on June 3, 2015 at 11:15 AM.

Assists in measuring exposure burden

National Healthcare Safety Network
Rate Table - All CDI LabID Events by Location
CDI Prevalence - Community-Onset Admission Prevalence Rate
As of June 19, 2015 at 7:50 AM
Date Range: LABID_RATE ECDIF summary yr: 2014 to 2014

<table>
<thead>
<tr>
<th>summaryYr</th>
<th>months</th>
<th>location</th>
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<th>numadms</th>
<th>CDI_COprevRate</th>
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<td>FACWIDEIN</td>
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<td>10098</td>
<td>0.456</td>
</tr>
</tbody>
</table>

For 2015 and forward, FACWIDEIN excludes LabID events reported for rehabilitation wards and behavioral health/psych wards that have a CCN that is different from the acute care hospital.

Source of aggregate data: Not available
Data contained in this report were last generated on June 3, 2015 at 11:15 AM.

National Healthcare Safety Network
Rate Table - All CDI LabID Events by Location
CDI Prevalence - Inpatient CDI Overall Prevalence Rate
As of June 19, 2015 at 7:50 AM
Date Range: LABID_RATE ECDIF summary yr: 2014 to 2014

<table>
<thead>
<tr>
<th>summaryYr</th>
<th>months</th>
<th>location</th>
<th>CDIF_labIDCount</th>
<th>numadms</th>
<th>CDIF_prevRate</th>
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</thead>
<tbody>
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<td>12</td>
<td>FACWIDEIN</td>
<td>137</td>
<td>10098</td>
<td>1.387</td>
</tr>
</tbody>
</table>

For 2015 and forward, FACWIDEIN excludes LabID events reported for rehabilitation wards and behavioral health/psych wards that have a CCN that is different from the acute care hospital.

Source of aggregate data: Not available
Data contained in this report were last generated on June 3, 2015 at 11:15 AM.
• **Admission Prevalence Rate** = Number of 1st LabID Events per patient per month identified ≤3 days after admission to the location (if monitoring by inpatient location), or the facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

• **Community-Onset (CO) Admission Prevalence Rate** = Number of CDI LabID events that are CO, per month, in the facility / Number of patient admissions to the facility x 100 (this calculation is only accurate for Overall Facility-wide Inpatient reporting)

• **Overall Patient Prevalence Rate** = Number of 1st CDI LabID Events per patient per month regardless of time spent in location (i.e., prevalent + incident, if monitoring by inpatient location), or facility (i.e., CO + CO-HCFA + HO, if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100
Measure of infection burden and healthcare acquisition
• **Facility CDI Healthcare Facility-Onset Incidence Rate** = Number of all Incident hospital-onset (HO) CDI LabID Events per month in the facility / Number of patient days for the facility x 10,000 (this calculation is only accurate for Overall Facility-wide Inpatient reporting)

• **Facility CDI Combined Incidence Rate** = Number of all Incident HO and CO-healthcare facility-associated (HCFA) CDI LabID Events per month in the facility / Number of patient days for the facility x 10,000 (this calculation is only accurate for Overall Facility-wide Inpatient reporting)
Frequency Table
**National Healthcare Safety Network**

**Frequency Table - All CDIF LabID Events**

As of: June 19, 2015 at 8:31 AM

Date Range: LABID_EVENTS specimenDate 01/01/2014 to 12/31/2014

---

### Table of specimenSource by onset

<table>
<thead>
<tr>
<th>specimenSource</th>
<th>CO</th>
<th>CO-HCFA</th>
<th>HO</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOOL</td>
<td>117</td>
<td>49</td>
<td>107</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>42.86</td>
<td>17.95</td>
<td>39.19</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>49</td>
<td>107</td>
<td>273</td>
</tr>
</tbody>
</table>

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**Fictitious Data**

Single Report to show a summary of your CDI by onset.
Can track frequency overtime.
Targeted Assessment for Prevention (TAP) Reports
TAP Reports Overview

• NHSN Data
• Targets prevention efforts to the areas of greatest need
• QIO has state-wide report capabilities to enable blinded facility benchmarking
• Uses a metric called the cumulative attributable difference (CAD)

Number of prevented infections needed in order to reach target prevention goal
TAP Reports...

are available for different infections.

• CLABSI
• CAUTI
• CDI

are customizable.

• Facility-specific
• System-wide (if you have a group set up)
**Location Rank**
Ranked by highest to lowest CAD and assists you in identifying where to focus QI efforts

**Event**
The number of infections

**CAD**
How many infections a unit must reduce to achieve target

**SIR**
Observed/Expected

**Number of Pathogens**
Enables infection control professionals (ICPs) to identify pathogens
**Facility Rank**
How your facility ranks compared to other Ohio facilities.

**Facility CAD**
How many infections you need to reduce to achieve the target SIR.

**Location Rank**
Where specific units rank in the hierarchy of infections.

**Location CAD**
How many infections a specific unit needs to reduce to achieve the target SIR.

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TAP Report

Analysis → Output Options → TAP Reports → Acute Care Hospitals → CDC Defined Output

Select “Modify”
Able to change date variable

Data is more valid with larger time frames

Leave blank
The SIR can be an ambiguous number. The CAD provides a definite target to aim your improvement efforts.
Where would you focus your quality improvement efforts?
Driving Quality with NHSN Reports

- You are collecting valuable data
- Do not just report to meet CMS requirements
- Use your data for quality improvement efforts
- Valuable analysis can be done to drive your performance improvement
You’re Invited!
New Confer Rights Templates in NHSN
The template will allow HSAG (your QIO) to continue to provide you with NHSN technical assistance.

Please accept
Join the CMS-Sponsored HAI Collaborative!

<table>
<thead>
<tr>
<th>Hospital</th>
<th>HSAG (California’s QIO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Commit to evidence-based practices.</td>
<td>• Review NHSN data for timeliness.</td>
</tr>
<tr>
<td>• Confer NHSN rights to share data with HSAG.</td>
<td>• Target and maximize value-based purchasing performance scores.</td>
</tr>
<tr>
<td>• Support unit-based quality improvement by integrating evidence-based safety practices into daily work of a clinical area.</td>
<td>• Data analysis using the new CDC TAP reports.</td>
</tr>
<tr>
<td></td>
<td>• One-on-one technical assistance for:</td>
</tr>
<tr>
<td></td>
<td>• HAI surveillance definitions</td>
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<td></td>
<td>• NHSN unit mapping</td>
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<td>• NHSN data validation</td>
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<tr>
<td></td>
<td>• Root cause analyses on infection events</td>
</tr>
</tbody>
</table>

• HSAG will partner with you to reduce HAI in your facility
• No cost, data-driven approach to improving quality and patient safety
Questions?

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This material was prepared by Health Services Advisory Group, the Medicare Quality Improvement Organization for California, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. Publication No. CA-11SOW-C.1-06192015-01