Using Data for Prevention: Targeted Assessment for Prevention Strategy

Carolyn Gould, MD, MSCR
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

ELC HAI and Ebola Supplement Grantees’ Meeting
November 18, 2015
Nothing to disclose
Targeted Assessment for Prevention (TAP) Strategy

Target → Assess → Prevent

- Target facilities/units with high burden/excess of HAIs
- Assess gaps in infection prevention in targeted facilities/units
- Prevent infections by implementing interventions to address the gaps

A linear progression framework for quality improvement

http://www.cdc.gov/hai/prevent/tap.html
The Five "W"s of the Targeted Assessment for Prevention (TAP) Strategy

WHAT is the TAP strategy?
The Targeted Assessment for Prevention (TAP) strategy is a method developed by the Centers for Disease Control and Prevention (CDC) to use data for action to prevent healthcare-associated infections (HAIs). The TAP strategy targets healthcare facilities and specific units within facilities with a disproportionate burden of HAIs so that gaps in infection prevention in the targeted locations can be addressed. The TAP report uses a metric called the cumulative attributable difference (CAD). The CAD is the number of infections that must be prevented to achieve a HAI reduction goal and is calculated by subtracting a numerical prevention target from an observed number of HAIs. The TAP report allows for the ranking of facilities, or locations within individual facilities, by the CAD to prioritize prevention efforts where they will have their greatest impact.
A Measure to Target Prevention to Reach HAI Reduction Goals

Cumulative Attributable Difference (CAD)

\[
CAD = \text{OBSERVED} - (\text{PREDICTED} \times SIR_{\text{goal}})
\]

- \( SIR_{\text{goal}} \) can be chosen based on goals of a group, state, organization, or national target
  - Lower target SIR → larger CAD ("excess" number of infections)
  - NHSN uses HHS target SIRs with option to customize
- \( CAD \) is the number of infections needed to prevent to reach the \( SIR_{\text{goal}} \)

Courtesy of Minn Soe, CDC
Cumulative Attributable Difference (CAD)

\[ \text{CAD} = \text{observed} - \text{predicted} = 3.3 \]
Targeted Assessment for Prevention of Healthcare-Associated Infections: A New Prioritization Metric

Minn M. Soe, MBBS, MPH; Carolyn V. Gould, MD, MSCR; Daniel Pollock, MD; Jonathan Edwards, MStat

OBJECTIVE. To develop a method for calculating the number of healthcare-associated infections (HAI) that must be prevented to reach a HAI reduction goal and identifying and prioritizing healthcare facilities where the largest reductions can be achieved.

SETTING. Acute care hospitals that report HAI data to the Centers for Disease Control and Prevention’s National Healthcare Safety Network.

METHODS. The cumulative attributable difference (CAD) is calculated by subtracting a numerical prevention target from an observed number of HAI. The prevention target is the product of the predicted number of HAI and a standardized infection ratio goal, which represents a HAI reduction goal. The CAD is a numeric value that if positive is the number of infections to prevent to reach the HAI reduction goal. We calculated the CAD for catheter-associated urinary tract infections for each of the 3,639 hospitals that reported such data to National Healthcare Safety Network in 2013 and ranked the hospitals by their CAD values in descending order.

RESULTS. Of 1,578 hospitals with positive CAD values, preventing 10,040 catheter-associated urinary tract infections at 293 hospitals (19%) with the highest CAD would enable achievement of the national 25% catheter-associated urinary tract infection reduction goal.

CONCLUSION. The CAD is a new metric that facilitates ranking of facilities, and locations within facilities, to prioritize HAI prevention efforts where the greatest impact can be achieved toward a HAI reduction goal.

Infect. Control Hosp. Epidemiol. 2015;00(0):1–6
Impact on 2013 National CAUTI SIR (SIR= 1.057) and Number of Hospitals Needed to Target to Reach National HHS Goal (SIR = 0.75) among NHSN Hospitals with SIR > 0.75

Of 1,578 hospitals with positive CAD, preventing 10,040 CAUTIs at 293 hospitals (19%) with highest CAD would enable achievement of the national 25% CAUTI reduction goal.
Benefits of TAP Strategy

- Focused approach to prevention
- Within targeted facilities, excess HAIs mapped to unit level
- CAD is a concrete prevention goal linked to the SIR
- Specific gaps in infection prevention identified through a standardized assessment of targeted units
- Implementation strategies customized to address gaps
# TAP Tools:

## 1. Target: TAP Reports

### Facility-level

<table>
<thead>
<tr>
<th>FACILITY RANK</th>
<th>ORGID</th>
<th>STATE</th>
<th>BEDS</th>
<th>NO. LOCATION (ICU, NON-ICU)</th>
<th>CAUTIS (ICU, NON-ICU)</th>
<th>DEVICE DAYS (ICU, NON-ICU)</th>
<th>DU% (ICU, NON-ICU)</th>
<th>CAD (ICU, NON-ICU)</th>
<th>SIR (ICU, NON-ICU)</th>
<th>ICU: TOTAL NO. PATHOGENS (% EC, YS, PA, KPO, FS, PM, ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>001</td>
<td>AA</td>
<td>325</td>
<td>6(4,2)</td>
<td>42(34,8)</td>
<td>6861(5364,1497)</td>
<td>26(56,9)</td>
<td>22.9(17.8,5.2)</td>
<td>2.2(2.1,2.8)</td>
<td>37 ( 24, 14, 16, 8, 11, 0, 0)</td>
</tr>
<tr>
<td>2</td>
<td>002</td>
<td>AA</td>
<td>586</td>
<td>3(2,1)</td>
<td>73(70,3)</td>
<td>14292(13898,394)</td>
<td>48(70,4)</td>
<td>21.6(20.1,1.5)</td>
<td>1.4(1.4,2)</td>
<td>78 (27, 17, 10, 17, 12, 1, 0)</td>
</tr>
<tr>
<td>3</td>
<td>003</td>
<td>AA</td>
<td>471</td>
<td>3(2,1)</td>
<td>28(26,2)</td>
<td>6255(5880,375)</td>
<td>51(72,9)</td>
<td>15.6(15.1,0.6)</td>
<td>2.3(2.4,1.4)</td>
<td>28 (21, 36, 7, 7, 7, 0, 0)</td>
</tr>
<tr>
<td>4</td>
<td>004</td>
<td>AA</td>
<td>340</td>
<td>1(1,0)</td>
<td>36(36,.)</td>
<td>6760(6760,.)</td>
<td>84(84,.)</td>
<td>13(13,.)</td>
<td>1.6(1.6,.)</td>
<td>36 (36, 36, 8, 6, 0, 0, 0)</td>
</tr>
<tr>
<td>5</td>
<td>005</td>
<td>AA</td>
<td>646</td>
<td>4(4,0)</td>
<td>45(45,.)</td>
<td>11569(11569,.)</td>
<td>71(71,.)</td>
<td>12.2(12.2,.)</td>
<td>1.4(1.4,.)</td>
<td>45 (22, 31, 4, 9, 2, 2, 16)</td>
</tr>
</tbody>
</table>

### Unit-level

<table>
<thead>
<tr>
<th>FACILITY RANK</th>
<th>ORGID</th>
<th>LOCATION RANK*</th>
<th>LOCATION</th>
<th>CDC LOCATION TYPE</th>
<th>EVENT</th>
<th>DEVICE DAYS</th>
<th>DU</th>
<th>CAD</th>
<th>SIR</th>
<th>TOTAL NO. PATHOGENS (% EC, YS, PA, KPO, FS, PM, ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>001</td>
<td>1</td>
<td>1073</td>
<td>IN:ACUTE:CC:B</td>
<td>14</td>
<td>1783</td>
<td>48%</td>
<td>6.2</td>
<td>1.78</td>
<td>16 ( 31, 6, 25, 13, 0, 0, 0)</td>
</tr>
<tr>
<td>1</td>
<td>1001</td>
<td>10</td>
<td>11001</td>
<td>IN:ACUTE:CC:S</td>
<td>10</td>
<td>1443</td>
<td>64%</td>
<td>6.2</td>
<td>2.66</td>
<td>10 ( 30, 10, 0, 10, 10, 0, 0)</td>
</tr>
<tr>
<td>3</td>
<td>004</td>
<td>10</td>
<td>1001</td>
<td>IN:ACUTE:CC:M_PED</td>
<td>4</td>
<td>197</td>
<td>18%</td>
<td>3.8</td>
<td>.</td>
<td>5 ( 20, 0, 20, 40, 0, 0)</td>
</tr>
<tr>
<td>4</td>
<td>1001</td>
<td>10</td>
<td>10011</td>
<td>IN:ACUTE:STEP</td>
<td>5</td>
<td>964</td>
<td>13%</td>
<td>3.2</td>
<td>2.72</td>
<td>5 ( 20, 80, 0, 0, 0, 0, 0)</td>
</tr>
<tr>
<td>5</td>
<td>1002</td>
<td>10</td>
<td>1012</td>
<td>IN:ACUTE:WARD:M</td>
<td>3</td>
<td>533</td>
<td>6%</td>
<td>2</td>
<td>2.96</td>
<td>4 ( 50, 0, 25, 0, 0, 0, 0)</td>
</tr>
<tr>
<td>6</td>
<td>1002</td>
<td>10</td>
<td>1002</td>
<td>IN:ACUTE:CC:M</td>
<td>6</td>
<td>1941</td>
<td>78%</td>
<td>1.5</td>
<td>1.34</td>
<td>6 ( 0, 50, 17, 0, 17, 0, 0)</td>
</tr>
</tbody>
</table>
# TAP Tools: 2. Assess: Facility Assessment Tools

## CAUTI

### I. General Infrastructure, Capacity, and Processes

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is senior leadership involved in CAUTI prevention activities?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is unit-level leadership involved in CAUTI prevention activities?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Does your facility currently have a team/work group focusing on CAUTI prevention?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Does your facility have a staff person with dedicated time to coordinate CAUTI prevention activities?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Does your facility have a nurse champion for CAUTI prevention activities?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### II. Appropriate Indications for Indwelling Urinary Catheter Insertion

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do ordering providers document an indication for indwelling urinary catheters at your facility/unit?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Do ordering providers use indwelling urinary catheters for appropriate indications?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Do nurses use alternative strategies for management of urinary incontinence (e.g., external catheters, bedside commodes, scheduled toileting, garments/pads)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Do nurses use bladder ultrasound scanners to confirm urinary retention before placing or replacing urinary catheters?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do nurses use bladder ultrasound scanners with intermittent catheterization for management of postoperative urinary retention?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Does your facility/unit provide instructions for nurses...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pairing results of assessment with implementation tool allows facilities to identify and utilize existing infection prevention methods that most directly meet their needs.

1. **General Infrastructure, Capacity, and Processes**
   - **Engagement of Leadership, Champions, and Staff**
   - **Engage the Senior Executive Module - Comprehensive Unit-based Safety Program (CUSP) Toolkit**
     - Curriculum focused on the role and responsibilities of senior executives, from the Agency for Healthcare Research and Quality (AHRQ)
   - **Strategies and Tips for Nurse Engagement**
     - Strategies to engage nurses as champions in CAUTI prevention, from catheterout.org
   - **Strategies and Tips for Physician Engagement**
     - Strategies to engage physicians as champions in CAUTI prevention, from catheterout.org
   - **Presentation to Nurse Manager & Case Manager (or Unit Champion)**
     - Agenda for presentation to unit champion, from the On the CUSP: Stop CAUTI Implementation Guide

2. **Physician Engagement**
   - **Specific Strategies for Physician Engagement (PDF)**
   - **Physician Engagement: Key Tips (PDF)**
     - Data collection and evaluation
     - Printer-friendly version

3. **catheterout.org**

   - Website for infection prevention resources and strategies.

TAP Tools:
3. **Prevent: Implementation Guides**
Implementation of TAP Strategy

- **CMS Quality Innovation Network-Quality Improvement Organizations (QIN-QIOs) during 11th Scope of Work**
  - All 14 QIN-QIOs for CAUTI (>1,350 hospitals in 50 states)
  - 10 QIN-QIOs (28 states) for CDI

- **State Health Departments**

- **Health Research & Educational Trust Collaboration**
  - Engaging Partners in Infection Prevention and Control in Acute Care Hospitals

- **Direct outreach to hospitals (in collaboration with SHDs) to direct them to state, regional, and national initiatives**

- **Facilities, healthcare systems, and group users**
  - As of Oct. 1, 2015 > 20,000 TAP reports run in NHSN
TAP Strategy ‘How To’ Guide
for the Group User
Targeted Assessment for Prevention: Using Data for Action
www.cdc.gov/hai/prevent/tap.html

The Targeted Assessment for Prevention (TAP) Strategy is a framework for quality improvement that offers a focused approach to infection prevention for healthcare facilities, healthcare systems, public health, and quality improvement partners. This strategy can be used to identify facilities and units with a high burden of healthcare-associated infections (HAIs) so that specific gaps in infection prevention can be identified and addressed. The TAP strategy incorporates the TAP reports generated in CDC’s National Healthcare Safety Network (NHSN) along with standardized assessment tools and accompanying implementation strategies.

This guide has been developed to facilitate implementation of the TAP Strategy by providing guidance and tips for success. This version offers guidance for the Group User – including Quality Innovation Networks-Quality Improvement Organizations (QIN-QIOs), State Health Departments, Healthcare Systems, and other quality improvement partners that have access to NHSN data. An additional version of the ‘How To’ Guide is available for the individual Facility User.

This guide will address the following steps of the TAP strategy:

I. Running TAP Reports
II. Interpreting TAP Reports to Target Facilities and Units
III. Communicating TAP Report Data to Engage Facility Leadership and Administrators
IV. Assessing the Gaps in Infection Prevention
V. Implementing Infection Prevention Strategies
State Partner Sharing

- Using data to identify regions, facilities, & locations to target prevention efforts and engage facilities
  - Practical implementation
  - Novel approaches
  - Overcoming challenges and barriers
  - Lessons learned
Tennessee’s Implementation of CDC’s Targeted Assessment for Prevention

Marion A. Kainer MD, MPH, FRACP, FSHEA
Director, Healthcare Associated Infections and Antimicrobial Resistance Program
Hai.Health@tn.gov
CAUTI SIR, TN: 2012-2014

NHSN Baseline SIR
# HAI Progress Report: Tennessee, 2013

## Table: HAI Rates in Tennessee

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSId Nat’l Baseline: 2008</td>
<td>95</td>
<td>↓ 14%</td>
<td>↓ 10%</td>
<td>↓ 52%</td>
<td>0.49</td>
<td>0.54</td>
</tr>
<tr>
<td>CAUTI Nat’l Baseline: 2009</td>
<td>94</td>
<td>↓ 10%</td>
<td>↑ 17%</td>
<td>↑ 24%</td>
<td>1.24</td>
<td>1.06</td>
</tr>
<tr>
<td>SSI, Abdominal Hysterectomy Nat’l Baseline: 2008</td>
<td>87</td>
<td>↑ 2%</td>
<td>↑ 3%</td>
<td>↓ 11%</td>
<td>0.89</td>
<td>0.86</td>
</tr>
<tr>
<td>SSI, Colon Surgery Nat’l Baseline: 2008</td>
<td>95</td>
<td>↑ 2%</td>
<td>↓ 1%</td>
<td>↓ 9%</td>
<td>0.91</td>
<td>0.92</td>
</tr>
<tr>
<td>MRSA Bacteremia Nat’l Baseline: 2011</td>
<td>115</td>
<td>2012 SIR not available</td>
<td>↑ 24%</td>
<td>↑ 13%</td>
<td>1.13</td>
<td>0.92</td>
</tr>
<tr>
<td>*C. difficile Infections Nat’l Baseline: 2011</td>
<td>115</td>
<td>2012 SIR not available</td>
<td>↓ 16%</td>
<td>↓ 23%</td>
<td>0.77</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Source: [CDC](http://www.cdc.gov/hai/pdfs/stateplans/factsheets/tn.pdf)
**CAD (or Number Needed to Prevent)**

**CAD = Cumulative Attributable Difference**

\[ CAD = \text{Obs}_{\text{FACILITY}} - (\text{Exp}_{\text{FACILITY}} \times \text{HHS Goal SIR}) \]

<table>
<thead>
<tr>
<th>2013 HHS Goals</th>
<th>SIR=0.75 (SSI, CAUTI, MRSA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SIR=0.50 (CLABSI)</td>
</tr>
<tr>
<td></td>
<td>SIR=0.70 (CDI)</td>
</tr>
</tbody>
</table>


[http://www.cdc.gov/hai/prevent/tap.html](http://www.cdc.gov/hai/prevent/tap.html)
Cumulative Attributable Difference (CAD)  
\[ CAD = \text{Obs}_{\text{FACILITY}} - (\text{Exp}_{\text{FACILITY}} \times \text{HHS Goal SIR}) \]

\[ \Rightarrow \text{Goal SIR} = 1 \]
\[ = 18 - (10 \times 1.0) \]
\[ = 8 \]

\[ \Rightarrow \text{HHS Goal SIR} = 0.7 \]
\[ = 18 - (10 \times 0.7) \]
\[ = 11 \]
<table>
<thead>
<tr>
<th>HAI</th>
<th>Type/Unit</th>
<th>SIR</th>
<th>CI</th>
<th>Actual</th>
<th>Must Prevent To Reach Goal**</th>
<th>SIR Goal**</th>
<th>TN SIR (2014-Q4)</th>
<th>Top 5 Most Preventable Infections? (2014-Q4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUTI</td>
<td>A/P ICUs</td>
<td>1.41</td>
<td>(1.04, 1.87)</td>
<td>45</td>
<td>13</td>
<td>0.75</td>
<td>1.09</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>A/P Wards</td>
<td>0.82</td>
<td>(0.57, 1.14)</td>
<td>32</td>
<td>12</td>
<td>0.75</td>
<td>0.52</td>
<td>YES</td>
</tr>
<tr>
<td>CLABSI</td>
<td>A/P ICUs</td>
<td>0.57</td>
<td>(0.31, 0.94)</td>
<td>13</td>
<td>.</td>
<td>0.50</td>
<td>0.37</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>A/P Wards</td>
<td>0.67</td>
<td>(0.21, 1.61)</td>
<td>4</td>
<td>1</td>
<td>0.50</td>
<td>0.38</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>NICUs</td>
<td>0.33</td>
<td>(0.11, 0.80)</td>
<td>4</td>
<td>.</td>
<td>0.50</td>
<td>0.35</td>
<td>NO</td>
</tr>
<tr>
<td>LabID</td>
<td>CDI</td>
<td>1.56</td>
<td>(0.89, 2.55)</td>
<td>14</td>
<td>5</td>
<td>0.70</td>
<td>0.80</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>MRSA</td>
<td>2.29</td>
<td>(1.59, 3.19)</td>
<td>32</td>
<td>18</td>
<td>0.75</td>
<td>0.96</td>
<td>YES</td>
</tr>
<tr>
<td>SSI</td>
<td>CABG</td>
<td>0.26</td>
<td>(0.11, 0.54)</td>
<td>6</td>
<td>.</td>
<td>0.50</td>
<td>0.46</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>COLO</td>
<td>1.29</td>
<td>(0.63, 2.36)</td>
<td>9</td>
<td>2</td>
<td>0.75</td>
<td>0.78</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>HYST</td>
<td>1.00</td>
<td>(0.05, 4.93)</td>
<td>1</td>
<td>.</td>
<td>0.75</td>
<td>0.75</td>
<td>NO</td>
</tr>
</tbody>
</table>
TN HAI Prevention Calculator

HAI: CAUTI
Target SIR: 0.75

Number of Infections: 67

Number Predicted: —OR— Current SIR: 1.3

Compute

Clear Form
TN HAI Prevention Calculator

HAI: CAUTI
Target SIR: 0.75

Number of Infections: 67

Number Predicted: [blank] -OR- Current SIR: 1.3

Compute

Need to prevent 29 infections to reach target SIR of 0.75

Clear Form

http://tn.gov/health/article/hai-prevention-calculator
What’s possible in TN?  For CAUTI (2013):

- Top 5 comprise ~50% of “excess” infections
  - Variety of facility types/sizes in this group

- Hypothetically, if each of these 5 facilities reached the HHS goal:
  - TN SIR of 1.38 → TN SIR of 1.00

- Alternately: Targeting Top 5 SIRs?
  - Eliminating ALL infections from these facilities:
    - TN SIR of 1.17
NNTP (CAD), CAUTI (TN 2013)
Impact of Targeting Methodology:
Number of CDI’s Prevented

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Top 5 Ranked Hospitals</th>
<th>Top 10 Ranked Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO-Prev. Rate</td>
<td>223</td>
<td>31</td>
</tr>
<tr>
<td>CO-CAD → HO-SIR</td>
<td>190</td>
<td>88</td>
</tr>
<tr>
<td>CAD Weighted</td>
<td>431</td>
<td>108</td>
</tr>
<tr>
<td>CO-Prev. Rate</td>
<td>269</td>
<td>59</td>
</tr>
<tr>
<td>CO-CAD → HO-SIR</td>
<td>413</td>
<td>183</td>
</tr>
<tr>
<td>CAD Weighted</td>
<td>697</td>
<td>138</td>
</tr>
</tbody>
</table>

Legend:
- Community Onset
- Hospital Onset
TAP Strategy

- Greatest return on investment
- NNTP or CAD easy to comprehend by front line staff (concrete number)
- Metric able to be used for small facilities

Our thoughts:
- Expand TAP strategy to CO-CDI and CO-MRSA and examining total-CAD, not just HO-CAD
- Use CO-CAD metric on regional level (e.g., healthcare coalitions) as a metric for all healthcare facilities across spectrum of healthcare PLUS incentives
Communicating with TAP Tools

Jamie Moran, MSN, RN, CIC
QI Consultant, Qualis Health

November 2015
Targeting Hospitals: CAD Bar
Targeting Units: Wheel of Misfortune

CLABSI
Excess Infections Relative to National SIR

50% of excess CLABSI occurred in just 6 of 243 monitored units in WA State.

22% occurred in 2 units of the same hospital
Assessing Facilities: FAT Graphic

Catheter-Associated Urinary Tract Infection (CAUTI) Prevention Assessment

24 Assessments Completed
- 17 by nurses
- 4 by physicians and other prescribers
- 1 by administrative leaders
- 2 by unknown roles

65.9% Affirmation of General Infrastructure, Capacity and Processes for Prevention
- 65.8% affirmed by nurses
- 66.7% affirmed by prescribers
- 76.0% affirmed by administrative leaders

2.45 GPA for Perceptions of Appropriate Indicators of Catheter Insertion
- 2.62 GPA scored by nurses
- 2.13 GPA scored by prescribers
- 1.70 GPA scored by administrative leaders

2.66 GPA for Perceptions of Aseptic Urinary Catheter Insertion
- 2.83 GPA scored by nurses
- 2.31 GPA scored by prescribers
- 2.50 GPA scored by administrative leaders

65.9% CAUTI in unit 5D ICU
- Number of CAUTIs in last 12 months

4.3 Number of expected CAUTIs in last 12 months

2.80 CAUTI Standardized Infection Ratio (SIR) [1.0 is the expected ratio] Lower is better.

1.06 National CAUTI Standardized Infection Ratio (SIR)*

1.01 Washington State CAUTI Standardized Infection Ratio (SIR)*

3.20 GPA for Perceptions of Proper Urinary Catheter Maintenance
- 3.56 GPA scored by nurses
- 1.83 GPA scored by prescribers
- 3.67 GPA scored by administrative leaders

2.86 GPA for Perceptions of Timely Removal of Urinary Catheters
- 2.87 GPA scored by nurses
- 3.00 GPA scored by prescribers
- 2.82 GPA scored by administrative leaders

1.91 GPA for Perceptions of Laboratory and Medication Practices
- 2.07 GPA scored by nurses
- 2.44 GPA scored by prescribers
- 0.25 GPA scored by administrative leaders

Top 10 Opportunities
1. Assess competency of bladder scanner use
2. Document an indication for insertion in the ED
3. Identify a physician CAUTI champion
4. Assess competency of catheter insertion at least annually
5. Require at 2 staff people to be present for insertions
6. Require orders for insertion in the ED
7. Use automatic stop orders for urinary catheters
8. Identify a staff person with time for CAUTI coordination
9. Do not order urine cultures on asymptomatic patients
10. Document indication, dose and duration of antimicrobials

GPA ("Grade Point Average"): GPA is the average rating, where ("Always" = 4.0, "Often" = 3.0, "Sometimes" = 2.0, "Rarely" = 1.0, and "Never" = 0.0). "Unknown" is scored as the equivalent of 0.0, and "Not Applicable" responses are excluded from the GPA calculation.

* 2013 data published by CDC January, 2015
HAI Ebola Grantees’ Meeting
Reactor Panel

Massachusetts Experience
Using NHSN Data for Action
Data For Action

• Quarterly data cleaning reports
• “One pagers”
• Collaboratives
• HAI Annual Report
• NHSN Data Validation – VHYS
• Targeted Assessment for Prevention (TAP) Strategy Reports
• Hemovigilance
Quarterly Data Cleaning Reports

- Sent to MA hospital infection preventionists (IPs) quarterly, to reconcile NHSN data
- Report aligns with CDC’s hospital internal validation guidance
• Statewide and hospital-specific data

• Posted on MDPH website:
• Hospital-specific HAI NHSN annual summary data for facility use

• Statewide Hospital Summary
Massachusetts has maintained a statewide SIR at or below 1.0. There has not been a statistically significant change in the statewide CLABSI SIR over time.
HAI Annual Report – Example Summary of SSI Results

- **Significantly Higher than Predicted**
  The number of infections reported is higher than the number of predicted infections.

- **Same as Predicted**
  The number of infections reported is the same as the number of predicted infections.

- **Significantly Lower than Predicted**
  The number of infections reported is lower than the number of predicted infections.
HAI Annual Report - Example
Adult & Pediatric CLABSI ICU Pathogens for 2013 and 2014

Calendar Year 2013
n=162
- Gram-positive bacteria (other): 6%
- Gram-negative bacteria (other): 20%
- Multiple Organisms: 9%
- Candida albicans: 10%
- Yeast/Fungus (other): 12%
- Enterococcus sp.: 19%
- Staphylococcus aureus: 5%
- Methicillin-resistant Staphylococcus aureus (MRSA): 4%

Calendar Year 2014
January 1, 2014 – December 31, 2014
n=161
- Gram-positive bacteria (other): 8%
- Gram-negative bacteria (other): 13%
- Multiple Organisms: 7%
- Candida albicans: 11%
- Yeast/Fungus (other): 14%
- Enterococcus sp.: 19%
- Staphylococcus aureus: 5%
- Methicillin-resistant Staphylococcus aureus (MRSA): 6%
- Coagulase-negative Staphylococcus: 3%
• Massachusetts hospitals performing vaginal hysterectomy procedures experienced a **significantly higher** number of infections than expected compared to national baseline data (Years 2010-2012 and 2014)
External Data Validation - VHYS

- MA VHYS rates are higher than expected

- Surgeon survey and IP survey looking at VHYS techniques and risk factors found no explanation for rate for infection

- 2015-2016 ELC funding: MDPH is conducting external validation of 2014 VHYS data
Statewide Prevention Collaboratives

- **Massachusetts Hospital Association (MHA)**
  - NHSN data are shared monthly to evaluate trends
  - MHA makes the data available on their Patient Care Link

- **Comprehensive Unit-based Safety Program (CUSP)**

- **AHA/HRET Hospital Engagement Network (HEN)**
  - NHSN data are shared monthly to monitor effectiveness of prevention initiatives

- **NeoQIC, the Neonatal Quality Improvement Collaborative of Massachusetts**
  - All Massachusetts NICUs participate (n=14)
  - NHSN data are shared quarterly and combined with other data sources to evaluate trends over time
• *C. difficile* infection prevention initiative: used to identify two hospitals and their long-term care partners for participation

• TAP report findings to continue to be utilized in collaborative work with Quality Improvement Organization (QIO)

• TAP Reports will be included in the quarterly data cleaning reports. Each hospital will receive individual data as well as de-identified data for all hospitals
100% of MA blood banks are enrolled and reporting to NHSN
100% of facilities (68/68) have 12 months of denominator reporting
100% are reporting adverse reactions
97% (66/68) have completed their Annual Facility Surveys
   - Characterize a facility for classification purposes
   - Learn about common practices in the field
   - Provides denominator data
   - Units and aliquots of specific blood products transfused and discarded monthly
Established Hemovigilance Technical Advisory Group (TAG)
First annual report distributed to all MA blood banks
Future directions:
   - Facilities to conduct internal analysis/benchmarking
   - Engage vendors in CDA architecture adoption
   - Further analysis around specific adverse reaction data
   - Collaborate with CDC to assist states interested in adoption of NHSN for hemovigilance reporting
Kansas Approach to HAI Reduction

Nadyne Hagmeier, RN | QI Project Manager
Kansas Foundation for Medical Care, Inc.
Kansas Approach to HAI Reduction

• Partnership is key:
  – Kansas Foundation for Medical Care (KFMC)
  – Kansas Department of Health and Environment, Bureau of Epidemiology and Health Informatics (KDHE)
  – KQIP: Kansas Quality Improvement Partnership
    • Kansas Hospital Association, Kansas Healthcare Collaborative, KFMC, KDHE
  – Kansas APIC Chapters (3)
  – Great Plains Quality Innovation Network
    • KS, NE, SD, ND
Collaborative Reports
Great Plains QIN Perspective on TAP

CAUTI TAP: Another Way to Hit the Bullseye

- Target: NHSN Report
- Prevent: CAUTI TAP Feedback Report

Assess: Survey Monkey of CAUTI TAP

Great Plains
Quality Innovation Network

- Kansas
- Nebraska
- South Dakota
- North Dakota

http://www.cdc.gov/hai/prevent/tap/resources.html
Using NHSN Data for Prevention – Wisconsin

Ashlie Dowdell
HAI Surveillance Coordinator
Wisconsin Division of Public Health
November 18, 2015
TAP Letters

- Sent to 36 hospitals if at least one target area had a CAD > 1.
- CLABSI, CDI and CAUTI results were included.
- Letters sent to IPs, hospital administrators, quality, and chief nursing officers.
- Encouraged to join a prevention collaborative led by the QIO/hospital association.
July 14, 2015

Hospital Administrator  
Name of Hospital  
Address

Dear:

As the Division of Public Health (DPH) reviews progress toward reducing healthcare-associated infections (HAIs), we extend our appreciation to you and your staff for your efforts to deliver the safest health care to Wisconsin patients. Significant progress toward reduction of selected HAIs has occurred during the past five years, thanks to healthcare facilities such as yours.

The success of Wisconsin healthcare organizations is exemplified by reductions in central line-associated bloodstream infections (CLABSI), with Wisconsin occurrence more than 50% below the national benchmark. This means we have exceeded the 2013 national goal set under the Department of Health and Human Services National HAI Action Plan. Statewide occurrence of methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia is also well below the national goal of a 25% reduction. Wisconsin hospitals have experienced a 44% reduction in MRSA bacteremia compared to the national benchmark.

However, despite great strides, challenges to HAI reduction remain. National goals toward reducing catheter-associated urinary tract infections (CAUTI) and *Clostridium difficile* infections (CDI) have not been met among Wisconsin hospitals. Furthermore, several individual facilities continue to experience CLABSI occurrence above the national goal.
You are receiving this letter because 2014 HAI data indicate your facility has not met the 2013 national HAI reduction goals for at least one of three targeted HAIs—CLABS, CAUTI or CDI. The table below indicates the HAIs for which your facility has an occurrence above the national goals set by the Department of Health and Human Services in the National HAI Action Plan. The cumulative attributable difference (CAD) is the number of infections that must be prevented within your facility to achieve the national standardized infection ratio (SIR) goal.

MetaStar, Inc. and the Wisconsin Hospital Association (WHA) provide HAI reduction consultative services, including education and peer networking, to Wisconsin healthcare facilities at no cost. The tradition of collaboration among Wisconsin hospitals is a proven method for improving healthcare quality, and DPH strongly encourages your facility to participate in one of the collaborative HAI reduction groups led by these organizations. We also encourage you to take advantage of their numerous training and educational opportunities. Participation in these activities will assist your healthcare quality teams in achieving the best patient outcomes possible. The attached brochure provides contact information for MetaStar and WHA.

Again, thank you for your contributions to statewide HAI reduction efforts. We look forward to even greater achievements as we continue our work together.

Sincerely,

Jeffrey P. Davis, MD
Chief Medical Officer and State Epidemiologist for Communicable Diseases

Cc: Chief Nursing Officers
    Infection Preventionists
    Quality Resources Directors
Hospital A
2014 NHSN Data as of July 9, 2015

<table>
<thead>
<tr>
<th>HAI</th>
<th>Number of Observed Events</th>
<th>Number of Predicted Events</th>
<th>2014 SIR</th>
<th>2013 National SIR Goal</th>
<th>CAD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDI (healthcare onset)</td>
<td>23</td>
<td>26</td>
<td>0.9</td>
<td>0.70</td>
<td>5</td>
</tr>
<tr>
<td>CAUTI (all locations)</td>
<td>5</td>
<td>4</td>
<td>1.3</td>
<td>0.75</td>
<td>2</td>
</tr>
<tr>
<td>CLABSI (all locations)</td>
<td>3</td>
<td>2</td>
<td>1.1</td>
<td>0.50</td>
<td>2</td>
</tr>
</tbody>
</table>

* CAD is calculated by subtracting the designated prevention target from an observed number of HAIs, and is the number of infections your facility needs to prevent to achieve the national goal during 2015, assuming no changes in the population at risk since 2014. The formula is:

Number of observed events – (Number of predicted events × national target SIR)
Take Advantage of HAI Resources

If your hospital has identified a need for improvement in the area of healthcare-associated infections (HAI), we encourage you to seek out key national and local organizations that offer the help you need.

MetaStar is a nonprofit quality improvement organization that offers free evidence-based resources, education, data reports, peer networking, and technical assistance for hospitals looking to prevent healthcare-associated infections, better coordinate care, and improve quality for value-based payment. MetaStar represents Wisconsin in Lake Superior Quality Innovation Network, a partnership under contract with the Centers for Medicare & Medicaid Services. MetaStar's focus is on infection prevention best practices and solutions. Participate in the learning and action network today.

Contact:
DeAnn Richards
drichards@metastar.com
Phone: 1-800-362-2320, ext. 8228

Online:
www.lsqin.org/hai
www.metastar.com

The Wisconsin Hospital Association (WHA), is a nonprofit membership organization, keeping members informed of important local and national legislative issues, interpreting clinical and quality issues for members, and providing up-to-date educational information. WHA's quality team has been successfully working with hospitals to reduce healthcare-associated infections and teaching best practices to engage patients and families in this important work. WHA's focus is on the culture of safety and quality. View the WHA Quality Center for key tools for your improvement journey.

Contact:
Jill Hanson
jhanson@wha.org
Phone: 1-608-268-1842

Online:
www.whaqualitycenter.org

The Centers for Disease Control and Prevention (CDC), works 24/7 to protect America from health, safety and security threats. Whether diseases start at home or abroad, are chronic or acute, curable or preventable, human error or deliberate attack, CDC fights disease. Find prevention guidelines, education, and more.

Online:
www.cdc.gov/hai

The Association for Professionals in Infection Control and Epidemiology (APIC) has a mission to create a safer world through prevention of infection by providing evidence-based, scientific, and proven resources to infection preventionists, healthcare professionals, and patients. Join your local chapter of APIC today.

Online:
www.apic.org/Professional-Practice/Overview
Hospital Report Cards

- Sent in late summer 2014 to all acute care and critical access hospitals reporting at least one of the selected topics in 2013 (111).
- Scatter plot of SIRs for CLABSI, CAUTI, MRSA bacteremia, CDI, and SSIs for COLO, HYST, KPRO, and HPRO.
- Data table with additional details (observed, predicted, confidence intervals, etc.).
- Hard copy mailing to hospital administrators and IPs to encourage awareness and discussion of HAIs.
Wisconsin CLABSI Standardized Infection Ratio (SIR)
All Reporting Units, 2013

Accessed July 10, 2014
Number of reporting hospitals = 91

Wisconsin 2013 SIR Values at Select Percentiles

<table>
<thead>
<tr>
<th>Percentile</th>
<th>SIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th</td>
<td>0.00</td>
</tr>
<tr>
<td>25th</td>
<td>0.00</td>
</tr>
<tr>
<td>50th</td>
<td>0.32</td>
</tr>
<tr>
<td>75th</td>
<td>0.66</td>
</tr>
<tr>
<td>90th</td>
<td>0.86</td>
</tr>
<tr>
<td>Hospital Code</td>
<td>Number of Observed Infections</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>cb</td>
<td>0</td>
</tr>
<tr>
<td>cc</td>
<td>4</td>
</tr>
<tr>
<td>cd</td>
<td>3</td>
</tr>
<tr>
<td>ce</td>
<td>0</td>
</tr>
<tr>
<td>cf</td>
<td>0</td>
</tr>
<tr>
<td>cg</td>
<td>0</td>
</tr>
<tr>
<td>ch</td>
<td>2</td>
</tr>
<tr>
<td>ci</td>
<td>0</td>
</tr>
<tr>
<td>cj</td>
<td>2</td>
</tr>
<tr>
<td>ck</td>
<td>0</td>
</tr>
<tr>
<td>cl</td>
<td>9</td>
</tr>
<tr>
<td>cm</td>
<td>0</td>
</tr>
<tr>
<td>cn</td>
<td>0</td>
</tr>
<tr>
<td>co</td>
<td>3</td>
</tr>
<tr>
<td>cp</td>
<td>2</td>
</tr>
<tr>
<td>cq</td>
<td>1</td>
</tr>
</tbody>
</table>
NHSN Tutorials
https://www.dhs.wisconsin.gov/hai/tutorials.htm

- Facility Set-up (run time 1:09:00, Adobe Connect, help) NEW! - Adding/editing monthly reporting plans, locations, users and surgeons; reassigning the facility administrator and addressing alerts.

- Add Locations (12 slides, run time 4:15, Adobe Connect, help)

- Add Users (7 slides, run time 3:20, Adobe Connect, help)

- Add/edit Surgeons (13 slides, run time 4:00, Adobe Connect, help)

- Confer Rights (14 slides, run time 6:41, Adobe Connect, help)

- Reassign a Facility Administrator (5 slides, run time 2:56, Adobe Connect, help)

- Add County as a Custom Field (8 slides, run time 2:37, Adobe Connect, help)

Specific Events

- Numerator and Denominator Data Entry (run time 1:04:56, Adobe Connect, help) NEW! - Adding data, importing CSV files

Analysis

- Analysis Overview/Generating Data Sets (run time 19:36, Adobe Connect, help) NEW!

- CMS Reports (run time 58:34, Adobe Connect, help) NEW!

- Modifying Reports (run time 1:01:47, Adobe Connect, help) NEW! - Modifying/customizing and publishing reports; creating output sets and exporting data.

- Standardized Infection Ratio (SIR) (run time 1:00:01, Adobe Connect, help) NEW! - Running, interpreting and graphing SIRs.
## SSI Data for Action

https://www.dhs.wisconsin.gov/hai/ssi-prevention.htm

### Data and statistics

**Wisconsin SSI Data - Quarter 1, 2015**

Number of hospitals reporting = 99

Data accessed from the National Healthcare Safety Network (NHSN) on August 20, 2015.

<table>
<thead>
<tr>
<th>Infections following all reported procedures</th>
<th>Total procedures performed</th>
<th>Wisconsin standardized infection ratio (SIR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>189</td>
<td>12,319</td>
<td>0.79*</td>
</tr>
</tbody>
</table>

(Number of observed infections divided by the number of predicted infections based on national data.)

* Statistically significantly lower than the national baseline, but not significantly different from last year at this time.
Questions?

Ashlie Dowdell
HAI Surveillance Coordinator
Wisconsin Division of Public Health
608-266-1122
ashlie.dowdell@wi.gov
Targeted Assessment for Prevention (TAP)

Rick Welsh, RN, CPHQ

Director, Behavioral Health

November 18, 2015
Health Services Advisory Group: QIN-QIO

U.S. Virgin Islands
Health Services Advisory Group Serves Nearly 25\% of Our Nation’s Beneficiaries

<table>
<thead>
<tr>
<th>State</th>
<th>Medicare Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona</td>
<td>1,078,109</td>
</tr>
<tr>
<td>Florida</td>
<td>3,845,591</td>
</tr>
<tr>
<td>California</td>
<td>5,518,014</td>
</tr>
<tr>
<td>Ohio</td>
<td>2,144,347</td>
</tr>
<tr>
<td>U.S. Virgin Islands</td>
<td>18,777</td>
</tr>
</tbody>
</table>

Source: CMS Denominator File: April 2013 – March 2014
HSAG CAUTI Data Feedback Report Intensive Care Units (ICUs)

Your Hospital’s CAUTI SIR

HHS 2013 National Prevention Target (0.750)

Lower rate = better performance

Source: NHSN
## Unit Ranking Based on CAD

<table>
<thead>
<tr>
<th>Facility CAD</th>
<th>Unit</th>
<th>Location Type</th>
<th>Expected Infections</th>
<th>Observed Infections</th>
<th>SIR</th>
<th>Catheter Days</th>
<th>Patient Days</th>
<th>Device Utilization Ration Facility Pooled Mean</th>
<th>CAD</th>
<th>Number of Pathogens (EC, YS, PA, KS, PM, ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.36</td>
<td>1</td>
<td>WARD</td>
<td>2.34</td>
<td>5</td>
<td>2.14</td>
<td>645</td>
<td>5,664</td>
<td>0.11</td>
<td>0.08</td>
<td>3.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5 (2, 0, 0, 1, 0, 0)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>ICU</td>
<td>5.94</td>
<td>7</td>
<td>1.18</td>
<td>1,747</td>
<td>2,356</td>
<td>0.74</td>
<td>0.75</td>
<td>2.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 (1, 0, 3, 0, 0, 1)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>WARD</td>
<td>0.67</td>
<td>1</td>
<td>NA</td>
<td>355</td>
<td>4,185</td>
<td>0.08</td>
<td>0.15</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 (1, 0, 0, 0, 0, 0)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>WARD</td>
<td>1.07</td>
<td>1</td>
<td>0.94</td>
<td>666</td>
<td>5,684</td>
<td>0.12</td>
<td>0.17</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 (0, 0, 1, 0, 0, 0)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>ICU</td>
<td>3.78</td>
<td>3</td>
<td>0.79</td>
<td>1,890</td>
<td>2,709</td>
<td>0.70</td>
<td>0.61</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 (1, 0, 0, 1, 0, 1)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>WARD</td>
<td>1.72</td>
<td>1</td>
<td>0.58</td>
<td>453</td>
<td>3,129</td>
<td>0.14</td>
<td>0.08</td>
<td>-0.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 (0, 0, 0, 0, 0, 0)</td>
</tr>
</tbody>
</table>

Source: NHSN
Erica Runningdeer, MSN, MPH, RN

Division of Patient Safety and Quality
Illinois Department of Public Health
Thank you!

Questions?

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov    Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.