TAP Strategy 'How To' Guide

for the _Individual Facility 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 individual Facility User; an additional version is available for use by Group Users (e.g., Quality Innovation Networks-Quality Improvement Organizations (QIN-QIOs), State Health Departments, Healthcare Systems).

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

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

Throughout this guide, you will come across the following features:

Outlined boxes offer a description or explanation of a specific feature within the TAP Report or TAP Strategy	**Blue Boxes** offer practical examples for utilizing TAP Report data for HAI prevention (illustrated through sample data from test facility "DHQP Memorial")	**Blue, underlined text contains hyperlinks** you can click to be directed to definitions or additional information

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Target ⟶ Assess ⟶ Prevent

Generate TAP Reports using NHSN to identify facilities and units with excess infections.

I. Running TAP Reports

TAP reports may be run in NHSN by a user for a single facility or by a group user for a group of facilities. The single-facility TAP report provides data at the unit level from all units in the facility reporting data to NHSN. The units are ranked by the cumulative attributable difference (CAD, see below).

> *Prior to running a TAP report, the user should ensure that the facilities are mapped to the appropriate NHSN locations.*
> Guidance on mapping NHSN locations can be found here.

To run a TAP Report in NHSN, Facility Users can find instructions here.
When running a TAP Report, the user can choose the following customizable elements:

1. **HAI type**

    Current options available include catheter-associated urinary tract infection (CAUTI), central line-associated bloodstream infection (CLABSI), and *Clostridium difficile* infection (CDI).

2. **Time period of interest**

    When running a TAP Report, the default option will provide a report that is inclusive of all data reported to NHSN that are included in the analysis datasets. To limit the TAP Report by time period, the user must select a date range for the period of interest. In general, at least one quarter period should be specified in order to have a representative amount of data.

3. **Standardized Infection Ratio goal (SIR goal)**

    The SIRgoal is a targeted SIR value for reduction of each HAI type.
    Default NHSN TAP report SIRgoals are based on the 2013 Department of Health and Human Services (HHS) 5-year HAI reduction targets:

    <div align="center">

    CAUTI SIRgoal: 0.75
    CDI SIRgoal: 0.70
    CLABSI SIRgoal: 0.50

    </div>

    Users may choose to customize the SIRgoal for the TAP reports by entering an SIR of their choice. For example, if a facility has reached the HHS target, they may wish to set a more ambitious SIRgoal. In addition, users may select the National SIR to use as the SIRgoal for their TAP report. The most recent national SIRs are published in the *National and State Healthcare-Associated Infections Progress Report* and are based on 2013 NHSN data. The flexibility of this metric is important to keep in mind as you run, interpret, and communicate information on the TAP reports.

4. **Display of variable labels**

    The user can opt to display labels in the TAP report that offer a better description than the default abbreviated variables. To obtain more descriptive labels in the output, check the "Use Variable Labels" box under the "Output Format" heading when running the TAP Report in NHSN.

II. _Interpreting the TAP Reports to Target Specific Units within the Facility_

Understanding the cumulative attributable difference (CAD) metric
As part of the TAP strategy, the CAD can promote use of data for action in several ways: 1) In conjunction with the SIR, the CAD can be used to identify and prioritize locations for targeting HAI prevention efforts; 2) The CAD translates a target SIR into a numeric HAI prevention goal, providing a concrete goal to drive action; and 3) The CAD can identify units with excess HAI burden that might otherwise be overlooked.

The CAD is used as a _prioritization_ metric to identify the units with the highest burden of excess infections. Targeting these locations will yield the largest impact on HAI prevention. Because the CAD is not adjusted by risk exposure size (e.g., a location with many urinary catheter days will likely have a higher CAD for CAUTI than a location with fewer urinary catheter days), it should _not_ be used as a metric to compare performance of units or facilities. Click here for a chart describing the features of the SIR and CAD metrics.

Click variable name to be directed to more information in this guide.

The unit-specific TAP Report output displays facility units ranked by their CADs.

CDI data are reported to NHSN on a facility-wide basis. Thus, TAP Reports for CDI will only display facility-wide CADs and will not provide unit-level rankings or unit-level CADs.

The surgical intensive care unit (SICU) at DHQP Memorial reported 5 CAUTI events and 5 pathogens during this reporting period. Shown here, 3 pathogens were yeast. This information can help facilities understand the events reported and implement the most appropriate prevention strategies.

No. of pathogens outside the parentheses represents total no. of pathogens reported. Only most common pathogen types are presented in parentheses, and some events may have > one type of pathogen.

Individual Facility, Unit-Specific Report - CAUTI example

Date Range: CAU_TAP summary Yr 2013 to 2013

Facility				Location								
Facility Org ID	Facility Name	Facility CAD	Location Rank	Location	CDC Location	Events	Urinary Catherter Days	DUR %	CAD	SIR	Sir Test	No. Pathogens (EC, YS, PA, KS, PM, ES
1000	DHQP Memorial	5.73	1	SICU	IN:ACUTE:CC:S	5	502	81	3.38	2.31	SIG	5 (0, 3, 1, 1, 0, 0)
			2	NEURO	IN:ACUTE:CC:N	3	257	77	1.58	1.58		3 (0, 0, 1, 0, 2, 0)
			3	BURN	IN:ACUTE:CC:B	2	162	61	1.10	1.67		2 (1, 0, 0, 0, 0, 0)
			4	REHAB	IN:ACUTE:WARD:REHAB	1	76	11	0.18	0.91		1 (0, 0, 0, 0, 1, 0)
			5	2N	IN:ACUTE:WARD:M	1	239	20	-0.20	0.63		1 (0, 0, 0, 0, 0, 0)
			6	6S	IN:ACUTE:WARD:M	1	261	20	-0.31	0.57		1 (0, 0, 0, 0, 0, 0)

If location-level CADs are the same in a given facility, their ranks are tie
(EC, YS, PA, KS, PM, ES) = No. of E. coli, yeast (both candida and non-candida species),
P. aeruginosa, *K. pneumoniae/K. oxytoca*, *Proteus Mirabilis*, *Enterococcus* species
SIR is set to '.' when expected number of events is < 1.0
LOCATION CAD = (OBSERVED_LOCATION - EXPECTED_LOCATION*0.75)

Rounding the CAD up to a whole number when explaining the data to leadership ensures that they understand how many infections they would have needed to prevent to reach the SIRgoal.

The SIR will display as missing when the predicted number of events is less than 1.0.

If nothing is listed under SIRtest, the SIR is not significantly higher than the SIRgoal. 'SIG' will be displayed if the SIR is significantly higher than the SIRgoal.
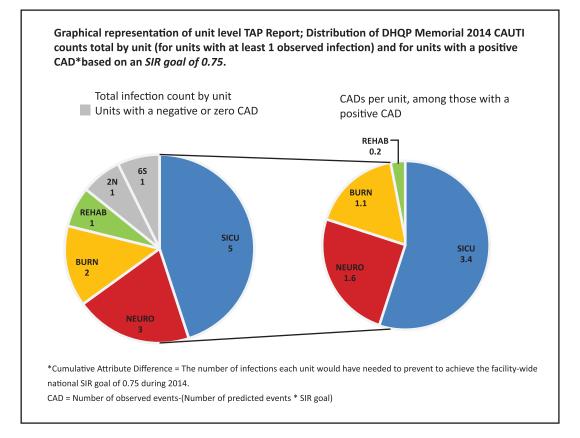
DHQP Memorial overall needed to prevent 6 infections (round up 5.7) to have met their SIR goal (0.75 for CAUTI) during this time period selected (Yr 2013). The SICU is the major contributor to the facility CAD, followed by the Neuro and Burn critical care units. DHQP Memorial should focus their CAUTI Prevention efforts on these units.

III. _Communicating TAP Report Data to Engage Facility Leadership and Administrators_

Summarizing and presenting the TAP Report data for facility leadership:

The next few pages display examples for presenting TAP Report data in a variety of ways. The presentation of the data to administrators is an important aspect of gaining leadership support for infection prevention activities. Caution should be taken to present the CAD in the context of quality improvement and not as a comparative metric for public reporting.

1. Example figure displaying distribution of total facility infection count and CADs by unit among units with a positive CAD (adapted from a figure developed by Jamie Moran, MSN, RN, CMSRN, CIC, Qualis Health).

Graphical representation of unit level TAP Report; Distribution of DHQP Memorial 2014 CAUTI counts total by unit (for units with at least 1 observed infection) and for units with a positive CAD*based on an _SIR goal of 0.75_.

Total infection count by unit
Units with a negative or zero CAD

CADs per unit, among those with a positive CAD

REHAB 0.2
BURN 1.1
SICU 3.4
NEURO 1.6

6S 1
2N 1
REHAB 1
BURN 2
SICU 5
NEURO 3

*Cumulative Attribute Difference = The number of infections each unit would have needed to prevent to achieve the facility-wide national SIR goal of 0.75 during 2014.

CAD = Number of observed events-(Number of predicted events * SIR goal)

To Facility Leadership:

"This pie chart displays the total number of CAUTIs per unit within DHQP Memorial for 2014. The colored sections indicate units with a positive CAD, or units that had more infections than predicted based on a goal SIR of 0.75. The CADs for each of these units are displayed in the pie chart on the right. Our facility should target CAUTI prevention efforts to these units for the greatest impact on the CAUTI SIR. Specifically, the SICU is the largest driver of the facility CAD and should be an area of focus for CAUTI prevention."

2. Example bar chart (adapted from an example created by Rick Welsh, RN, CPHQ, Health Services Advisory Group) displaying distribution of total infection count by unit for units with a positive CAD.
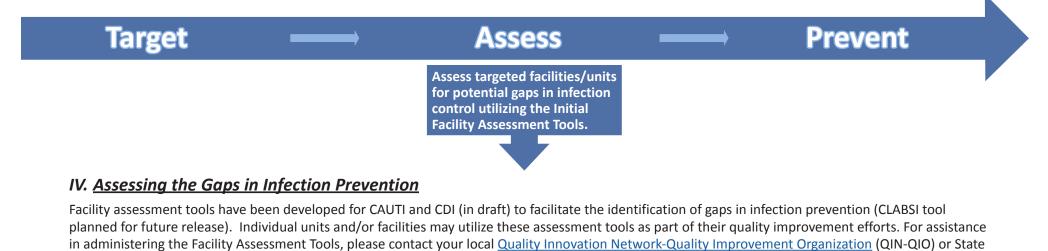

Graphical representation of unit level TAP Report; Distribution of Infection Counts and SIRs from units within DHQP Memorial that had excess CAUTIs (positive CADs) in 2014 based on an *SIRgoal of 0.75*

Note: This figure displays data for units with positive CADs only. For a complete list of units, refer back to the original TAP Report.
* Cumulative Attributable Difference - The number of infections each unit would have needed to prevent to achieve the facility-wide SIR goal of 0.75 during 2014.
The formula is: CAD = Number of observed events–(Number of predicted events*SIR goal)
** Standardized Infection Ratio (SIR) is not calculated for units with an expected number of events less than 1.0

To Facility Leadership:

"This bar chart displays the total infection counts among units with a positive CAD, or units that had more infections than predicted based on a goal SIR of 0.75. The CADs for each of these units are displayed in dark blue. The chart also indicates the SIR for each unit in relation to the CAD. DHQP Memorial should target CAUTI prevention efforts to these units for the greatest impact on CAUTI rates. Specifically, the SICU is the largest driver of the facility CAD and should be an area of focus for CAUTI prevention. In this case, the SICU also has the highest SIR compared to other units."

During the conversation with DHQP Memorial, a staff member stated, "The Neuro unit has a higher CAD, so must be performing worse than the Burn unit."

An appropriate response would be, "While the Neuro unit does have a higher CAD, we must note the limitation that the CAD should not be used as a comparative metric. If we instead look at the SIR (which can be used to compare locations), we see that the Burn unit actually has a slightly higher SIR than the Neuro unit. The CAD is higher in the Neuro unit because it is influenced by risk exposure size, in this case catheter days. The Neuro unit has a greater number of catheter days and accounts for a higher burden of infections than the Burn unit, with fewer catheter days."

Assess targeted facilities/units for potential gaps in infection control utilizing the Initial Facility Assessment Tools.

IV. *Assessing the Gaps in Infection Prevention*

Facility assessment tools have been developed for CAUTI and CDI (in draft) to facilitate the identification of gaps in infection prevention (CLABSI tool planned for future release). Individual units and/or facilities may utilize these assessment tools as part of their quality improvement efforts. For assistance in administering the Facility Assessment Tools, please contact your local Quality Innovation Network-Quality Improvement Organization (QIN-QIO) or State Health Department.

What method should be used to assess opportunities for improvement in the targeted units?

Using the TAP reports, DHQP Memorial has identified that they should target the SICU, Neuro, and Burn units to assess for potential gaps in infection control related to the HAIs of interest. The Facility Assessment Tools can facilitate this process. Assessments can be administered in person in the units, which can create invaluable opportunities to provide real-time teaching moments and increased HAI prevention awareness within the unit. Assessments can also be conducted electronically as the Assessment Tools have been formatted as Adobe fillable forms that allow for easy data collection.

Who should complete the Facility Assessment Tool?

The assessments aim to capture awareness and perceptions among staff related to HAI prevention policies and practices and does not require special expertise to complete. It is strongly encouraged that the tool be completed on an individual basis by a variety of staff members within an identified unit. From leadership to frontline, having multiple levels of staff (e.g., infection preventionist, unit manager, physicians, nurses, other frontline staff) complete the tool will allow for the simultaneous assessment of differences in awareness, knowledge, and perceived practices across the facility. This will allow you to identify areas of similarities and differences in responses and focus in on gaps and areas of improvement.

How do you learn from the assessments?

Once the assessments have been completed, the responses can be summarized and reviewed for gaps within different infection prevention areas, or domains. Visit the TAP Website for postings of tools as they are completed. For further assistance, contact your local QIN-QIO or State Health Department to facilitate data collection and summarization.

Utilize the Implementation Guide to access resources and address identified gaps by implementing proven prevention strategies.

V. *Implementing Infection Prevention Strategies*

The Facility Assessment Tool Excel Database can be used to summarize results from the Facility Assessment Tool administered to staff members within the identified units. Once all assessments have been imported into this database, it will automatically calculate summary statistics for the individual questions and overall summary scores. These features will aid in identifying domains and areas of improvement to address. Implementation strategies can then be customized to the particular gaps identified in the targeted locations. The CAUTI Toolkit Implementation Guide: Links to Resources can be found here.

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5. Does your facility have a *nurse* champion for CAUTI prevention activities?	6. Does your facility have a *physician* champion for CAUTI prevention activities?
# of Responses per Questions	
41	41
Yes:	**Yes:**
49%	15%
No:	**No:**
30%	36%
Unknown:	**Unknown:**
21%	49%

Clicking the link will direct you to the Catheter Out website, specifically to their Physician Engagement resources.

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I. General Infrastructure, Capacity, and Processes
Example Resources
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 preventions, from catheterout.org
Strategies and Tips for Physicians Engagement Strategies to engage physicians as champions in CAUTI preventions, from catheterout.org
Presentation to Nurse Manager & Case Manager (or Unit Champion) Agenda for presentation to unit champion, for the On the CUSP: Stop CAUTI Implementation Guide

3

catheterout.org

Physician engagement

Specific Strategies for Physician Engagement (PDF)

Physician Engagement: Key Tips (PDF)

< Data collection and evaluation

The CAUTI Facility Assessment Tool was administered to DHQP Memorial staff, with a particular focus on the SICU, Neuro, and Burn units. The point-of-contact received 41 responses for Section I Question 6, and found that only 15% indicated that the hospital does have a Physician Champion for CAUTI prevention activities. Using the CAUTI Implementation Guide: Links to Resources, DHQP Memorial accessed resources outlining strategies for Physician engagement from CatheterOut.org. A physician champion for CAUTI prevention was later identified and was successful in building physician support for their nurse-directed urinary catheter removal protocol in the targeted units.

For more information about how your facility can utilize the TAP Strategy, please visit the TAP website or contact your local Quality Innovation Network – Quality Improvement Organization (QIN-QIO) or State Health Department.

For more TAP Strategy resources, please visit the TAP website:

www.cdc.gov/hai/prevent/tap.html

Or contact:

HAIPrevention@cdc.gov

TAP Terms Glossary:

CAD (facCADloctype, facCAD, locCAD): *Cumulative Attributable* Difference is the number of infections that a facility would have needed to prevent to achieve an HAI reduction goal during a specified time period. A CAD > 0 indicates more infections than predicted, whereas a CAD < 0 indicates fewer infections than predicted.   ***CAD = Observed − (Predicted * SIRgoal)***

The CAD is calculated by subtracting a numerical prevention target from an observed number of HAIs. The prevention target is the product of the predicted number of HAIs and a standardized infection ratio goal (SIRgoal).

SIR Goal: *Standardized infection ratio target* (used as a multiplier in the CAD formula). HHS target SIRs are used in the NHSN TAP reports to calculate the CADs. The 2013 HHS targets for specific infections are as follows:

> CAUTI: Reduce by 25% SIRgoal = 0.75
> CDI: Reduce by 30% SIRgoal = 0.70
> CLABSI: Reduce by 50% SIRgoal = 0.50

While CDC uses HHS targets for the NHSN TAP reports, the SIRgoal may be adjusted and specified for any infection ratio target.

Facility Org ID (orgID): Designated ID for each free-standing hospital/facility in NHSN

Facility Name (name): User-defined name for each free-standing hospital/facility

Events (numEvent, infCount): The count of the specified HAI for the designated time period. This number also represents the observed number of infections for that HAI type. In parentheses, the counts for specific location types are broken out.

Urinary Catheter Days (facDDays, numucathdays): A count of the number of patients with urinary catheters in the patient care location during a time period. Device days for specific location types are broken out in parentheses.

Device Utilization Ratio (facDUR, locDUR): The number of device days divided by the number of patient days. DUR is a measure of device use on a given unit (relative to the number of patient days) and is shown as a percent. The DURs for specific location types are broken out in parentheses following the overall DUR.

SIR (facSIR, locSIR): *Standardized Infection Ratio* is the ratio of observed to predicted number of infections for a facility in the designated time period. In parentheses, SIRs for specific location types are broken out.

SIR Significance Test (SIRtest): Statistical test that displays 'SIG' if the SIR is statistically significantly greater than 1.

Number of Pathogens (numPathUTIICU, numPathUTIWard, numPathUTI): Total number of pathogens reported (in order) for all events reported. This number may be greater than the total events, as multiple pathogens may be reported per event.

Location Rank (locRank): A ranking of locations within a hospital to facilitate targeting of certain locations/units for additional prevention efforts. Location rank is only available for device-associated infections (i.e., CLABSI and CAUTI).

Location: User-defined name for each patient care area.

CDC Location (loccdc): NHSN requires that facilities map each patient care area in their facility to one or more standardized CDC locations as defined by NHSN in order to report surveillance data collected from these areas.

SIR and CAD Descriptive Chart

Metric	Definition	Calculation	Purpose	Limitations
SIR	A risk adjusted summary measure used to track HAIs over time. The SIR is a ratio of the actual number of HAIs reported to the predicted number, adjusted for facility and unit characteristics. An SIR > 1.0 indicates that more HAIs were observed than predicted, whereas an SIR < 1.0 indicates that fewer HAIs were observed than predicted.[1]	SIR = Observed / Predicted	Used as a *comparative* metric that adjusts for differences in incidence among risk exposure categories (e.g., location types, bed size, teaching status, facility type).	SIRs will not be calculated in NHSN when the predicted number of infections is < 1; specifying a longer time period may provide enough data to generate an SIR.
CAD	The CAD is the difference between the actual number of HAIs reported and the predicted number, adjusted for facility and unit characteristics. When the predicted number of infections is multiplied by a goal SIR, the CAD calculation gives the number of infections that need to be prevented to achieve that goal, assuming the same exposures over the same time period. A CAD > 0 indicates more infections than predicted, whereas a CAD < 0 indicates fewer infections than predicted.	CAD = Observed − (Predicted * SIRgoal)	Used as a *prioritization* metric to identify the facilities and units with the highest burden of excess infections. Targeting these locations will yield the largest impact on HAI prevention.	Because the CAD is influenced by exposure size (i.e., a larger hospital with many patient days will likely have a higher CAD than a smaller hospital), it should not be used as a metric to compare performance of units or facilities.

[1]Centers for Disease Control and Prevention. National Healthcare Safety Network (NHSN) e-news: SIRs special edition. http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_OCT_2010SE_final.pdf. Accessed July, 2015.

Sample data showing the comparison of the SIR and CAD

Hospital Type	Catheter Days	Observed Events	Predicted Events	SIRgoal	Predicted*SIRgoal	SIR	CAD
Major Teaching	9,000	36	12	0.50	6	3	30
Rural Hospital	1,497	6	2	0.50	1	3	5

While both the teaching and rural hospitals have the same SIR, their CADs differ greatly. This is due to the difference in catheter days, or risk exposure size. This demonstrates why the CAD **should not** be used as a comparative metric.