



TAP Strategy: Facility User 'How To' Guide

[TAP Website](https://www.cdc.gov/hai/prevent/tap.html) (<https://www.cdc.gov/hai/prevent/tap.html>)

The Targeted Assessment for Prevention (TAP) Strategy is a framework for quality improvement that maximizes infection prevention efforts of healthcare facilities, healthcare systems, and quality improvement partners. This Strategy can be used to identify facilities and units with a high burden of excess 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](https://www.cdc.gov/nhsn/) (NHSN) (<https://www.cdc.gov/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. The [TAP Strategy: Group User 'How To' Guide](https://www.cdc.gov/hai/pdfs/prevent/TAP-Guide-for-Group-User.pdf) (<https://www.cdc.gov/hai/pdfs/prevent/TAP-Guide-for-Group-User.pdf>) is also available for Group Users including State Health Departments, Healthcare Systems, and other quality improvement partners that have access to NHSN data.

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

1. [Running TAP Reports for a Facility](#)
2. [Interpreting TAP Reports to Target Prevention](#)
3. [Communicating TAP Report Data to Engage Facility Leadership and Administrators](#)
4. [Deploying TAP Facility Assessments to Identify Gaps in Infection Prevention](#)
5. [Implementing Infection Prevention Strategies](#)

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

1. Running TAP Reports for a Facility

TAP Reports are generated 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 for device-associated infections from all units reporting data to NHSN. These units are ranked by the Cumulative Attributable Difference ([CAD](#), see below). TAP Report data are provided at the facility-wide level for laboratory-identified events.

Prior to running a TAP report, ensure that the facilities are mapped to the appropriate NHSN locations. [CDC Locations and Descriptions and Instructions for Mapping Patient Care Locations](#) (https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf)

Instructions for running [TAP Reports for the Facility User](#) (https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/tapreports_facilities.pdf).

When running a TAP Report, the user may choose the following customizable elements:

- **HAI type**

Current options available include catheter-associated urinary tract infection (CAUTI), central line-associated bloodstream infection (CLABSI), *Clostridioides difficile* infection (CDI), and Methicillin-resistant *Staphylococcus aureus* (MRSA).

- **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. Select a time period of one quarter or more to have a representative amount of data.

- **Standardized Infection Ratio goal ([SIR goal](#))**

The SIRgoal is a target SIR value for each HAI type.

Default NHSN TAP Report SIRgoals are based on the 2020 Department of Health and Human Services (HHS) 5-year HAI reduction targets. Users may choose to customize the SIRgoal for 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 [2017 National and State Healthcare-Associated Infections Progress Report](#) (<https://www.cdc.gov/hai/data/portal/progress-report.html>) and are based on 2017 NHSN data.

The customizable nature of this metric is important to keep in mind as you run, interpret, and communicate information on the TAP Reports.

5-year HAI reduction targets: CAUTI SIRgoal: 0.75 CDI SIRgoal: 0.70 CLABSI SIRgoal: 0.50 MRSA SIRgoal: 0.50

- **Display of variable labels**

The default TAP Report displays abbreviated variable headers. To obtain more descriptive labels in the output, check the “Use Variable Labels” box under the “Output Format” header when running the TAP Report in NHSN.

2. Interpreting TAP Reports to Target Prevention

Understanding the Cumulative Attributable Difference (CAD) Metric

The CAD is the number of infections that need to be prevented to reach a target, or SIR goal. When interpreting the CAD, a positive value indicates excess infections, or additional burden of infections, than what would be predicted based on the SIR goal. A negative CAD value indicates fewer infections than predicted based on the same SIR goal. The higher the CAD, the larger burden of excess infections within the facility or location. For example, if a facility has a CAD of 16.3 when they run a TAP Report with an SIR goal of 0.50, the interpretation would be, “The facility would have needed to prevent 17 infections to reach their SIR goal of 0.50 during this time period”.

The CAD is used as a *prioritization* metric to identify the facilities and units with the highest burden of excess infections. Targeting these locations may 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 may 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. [See the appendix](#) for a chart describing the SIR and CAD metrics in more detail.

As part of the TAP Strategy, the [CAD](#) can promote the use of data for action in several ways:

- In conjunction with the SIR, the CAD can be used to identify and prioritize locations for targeting HAI prevention efforts.
- The CAD translates a target SIR into a numeric HAI prevention goal, providing a concrete goal to drive action.
- The CAD can identify units with excess HAI burden that might otherwise be overlooked.

An example TAP Report for an individual facility user displayed below, ranking the units by their CADs. Definitions for variables displayed within NHSN TAP Reports are listed at the end of this guide in the [TAP Glossary](#).

Individual Facility TAP Report – CAUTI example

National Healthcare Safety Network
 TAP Report for CAUTI Data for Acute Care and Critical Access Hospitals (2015 Baseline)
 Locations Ranked by CAD Within a Facility
 SIR Goal : HHS Goal = 0.75

As of: February 16, 2019 at 2:00 PM
 Date Range: All B52_TAP summaryYr 2018 to 2018

Facility				Location								
Facility Org ID	Facility Name	Facility CAD	Location Rank	Location	CDC Location	Events	Urinary Catheter Days	DUR %	CAD	SIR	SIR Test	No. Pathogens (EC, ESP, PA, KS, PS, 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)

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

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.

If location-level CADs are the same in a given facility, their ranks are tied.
 (EC, ESP, PA, KS, PS, ES)= No. of E. Coli, Enterobacter species, P. aeruginosa, K. pneumoniae/K. oxytoca, Proteus species, Enterococcus species
 DUR % not calculated if device days or patient days are missing at facility level
 SIR is set to '.' when expected number of events is < 1.0
 SIR TEST = 'SIG' means SIR > SIRgoal significantly
 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.

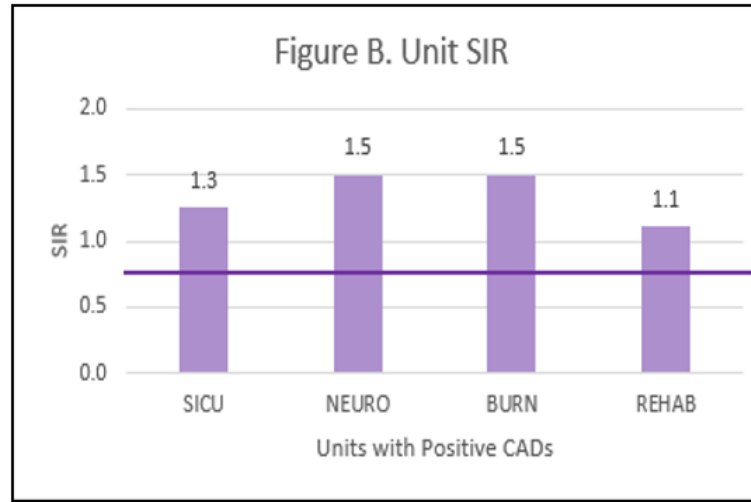
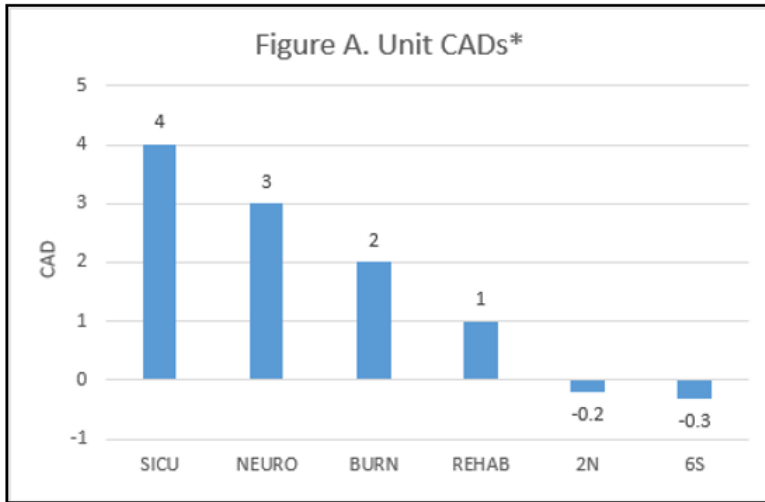
In this example, DHQP Memorial needed to prevent 6 infections overall (round up CAD of 5.7) to have met their SIR goal (0.75 for CAUTI) during this time period. The SICU is the major contributor to the facility CAD, followed by the Neuro and Burn critical care units. DHQP Memorial may choose to focus their CAUTI Prevention efforts on these units to more efficiently reach their prevention goals.

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

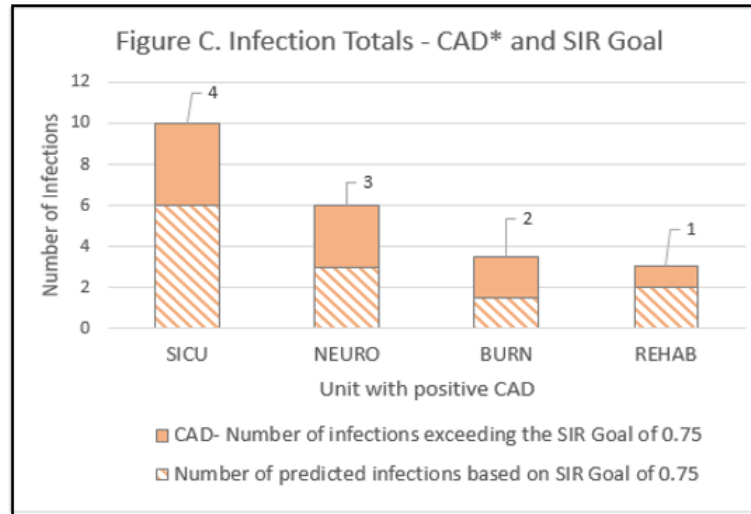
3. Communicating TAP Report Data to Engage Facility Leadership and Administrators

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 may be an important aspect of gaining leadership support for infection prevention activities. Presenting data to frontline staff members can also help engage them in facility prevention efforts. Caution should be taken to present the CAD in the context of quality improvement and not as a comparative metric for public reporting.*

Example 1: Figures displaying the CAUTI CADs and SIRs by unit within a facility



Location	SICU	NEURO	BURN	REHAB
Observed Infections	10	6	3	3
Predicted Infections	8	4	2	2.7
CAD*	4	3	2	1
SIR	1.3	1.5	1.5	1.1



This example utilizes the CAUTI SIR goal of 0.75. **Figure A** displays the CADs by unit. This facility may choose to focus their prevention efforts on the units with the positive CADs. **Figure B** displays the SIR per unit, for those with a positive CAD. **Figure C** shows the proportion of infections that are considered excess, above the 0.75 SIR infection goal, by location. If each unit had prevented the number of infections represented by the solid orange section of the bar (their CAD), they would have reached their goal SIR of 0.75.

*Positive CADs are rounded up to the next positive integer

Example 2: HAI summary table from the Arizona Department of Health Services, summarizing facility-level data metrics across multiple HAIs.

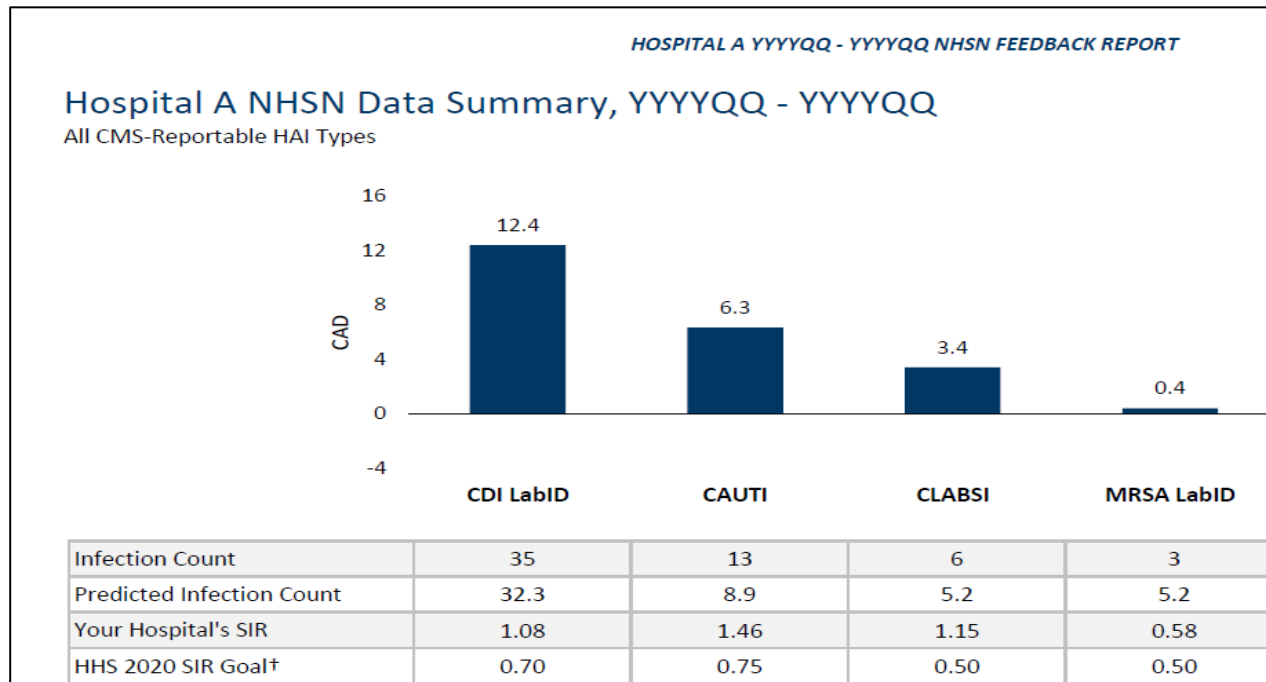
HOSPITAL XXX						
2017 Quarter 1: January 1- March 31						
	Observed Infections	Predicted Infections	Facility SIR	2020 HHS SIR Goals	CAD*	SIR Rank in Arizona**
CDI	19	21.7	0.9	0.7	4	29
MRSA	1	1.5	0.7	0.5	1	11
CLABSI	1	3.6	0.3	0.5	-0.8	8
CAUTI	1	4.0	0.3	0.75	-2	12

*Positive CADs are rounded up to the next positive integer.

**SIR rank is based on all Arizona acute care hospitals that had an SIR calculated in NHSN the most recent quarter.

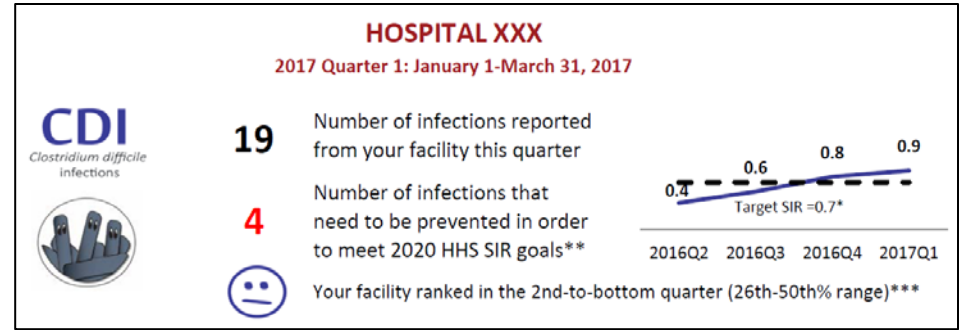
In this example, the table shows that the facility SIRs are below the HHS SIR goals for CLABSI and CAUTI, resulting in negative CADs. In order to meet the HHS SIR Goals for CDI and MRSA, the facility would have had to prevent 4 CDIs and 1 MRSA infection (as illustrated by the CADs).

Example 3: Figure and summary table from the Minnesota Department of Health, displaying infection data across multiple HAIs in the facility.

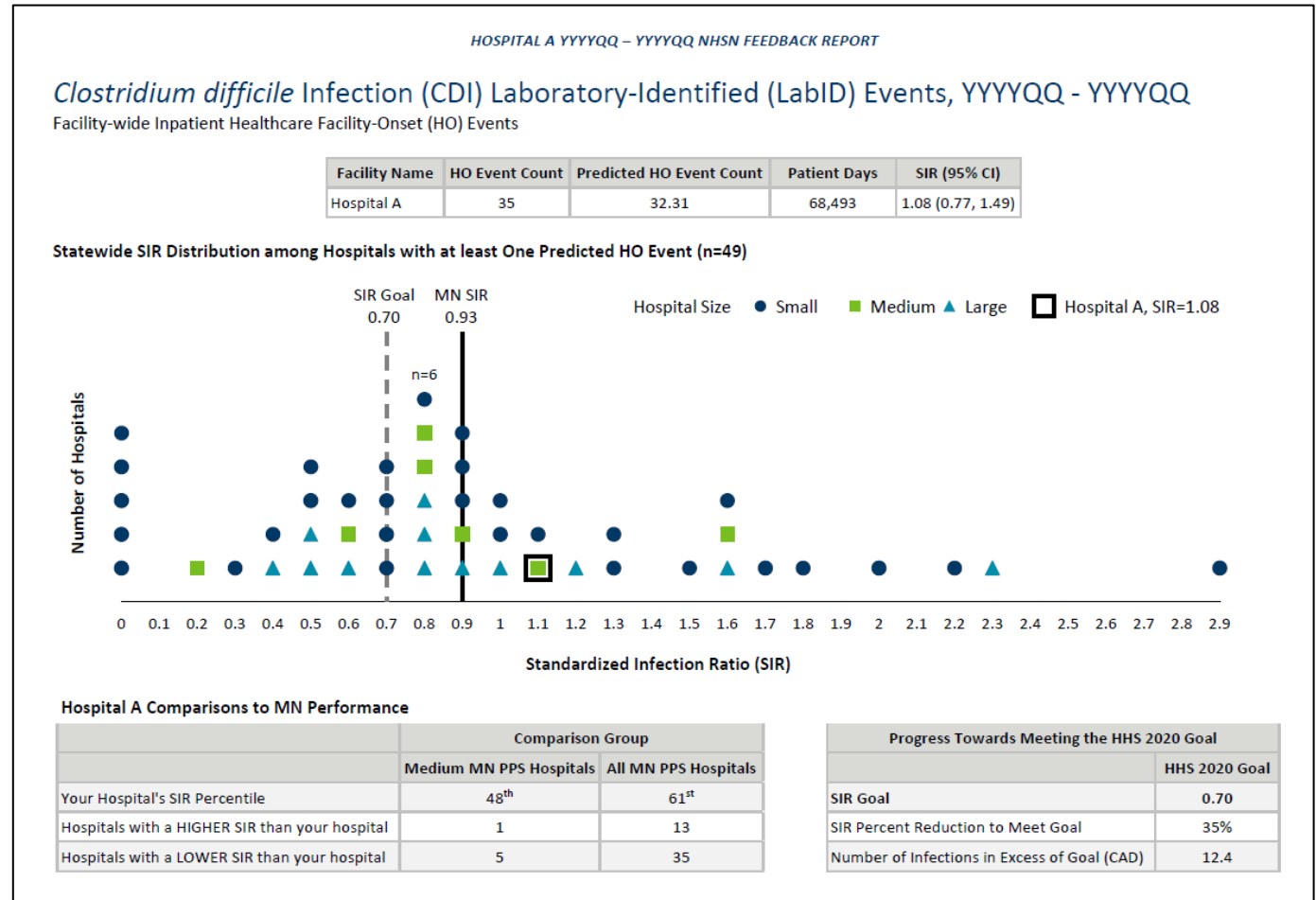


In this example, the CADs for each of the HAIs are represented in the bar chart with the corresponding infection data displayed in the table below. This facility may choose to focus on their CDI and CAUTI prevention efforts first, as these have the highest CADs, or highest burden of excess infections.

Example 4: CDI facility-level “report card” from the Arizona Department of Health Services, providing a quarterly snapshot of this facility’s CDI data.



Example 5: Figure and summary tables from the Minnesota Department of Health, displaying a facility’s CDI data in comparison to the statewide SIR distribution and to facilities of similar size.





Target

Assess

Prevent

Assess: Utilize Assessment tools to identify potential gaps in infection control

4. Deploying TAP Facility Assessments to Identify Gaps in Infection Prevention

The TAP Facility Assessment Tools are available for CAUTI, CDI, and CLABSI.* Assessments can be deployed across facilities and/or within targeted units to identify gaps in infection prevention. The Assessments aim to capture *awareness and perceptions* among staff related to HAI prevention policies and practices and do not require special expertise to complete. Each Assessment is customizable and may be modified to best align with facility priorities and prevention efforts. For example, partners may choose to distribute select domains or a subset of questions based on varying roles of healthcare personnel.

What methods can be used to deploy TAP Facility Assessments?

Facilities can use TAP Reports to target select units with the greatest burden of excess infections (based on their CADs) and/or deploy Assessments across the facility. Assessments can be administered through a variety of electronic methods (Adobe fillable form, SurveyMonkey, REDCap) and/or on paper.

Participating facilities/units should select the method(s) that will best facilitate distribution and collection of Assessments among staff.

Who should complete the Facility Assessment Tool?

TAP Facility Assessments should be administered to a variety of staff and healthcare personnel at different levels of the organization and/or unit including frontline providers (e.g., Nurses, Certified Nurse Assistants, Physicians), mid-level staff (e.g., Quality, Infection Prevention, Nurse Managers), and senior leadership (e.g., Directors, CEO). The minimum number of Assessments to collect will vary by facility size, however, the goal of identifying an accurate representation of infection prevention policies and practices should be considered. The greater number of Assessments completed, the greater the ability to identify gaps and target prevention.

How do you learn from the Assessments?

Once the Assessments have been completed, the responses can be summarized and reviewed for gaps using the TAP Feedback Reports. The TAP Feedback Reports highlight and prioritize potential gaps within different infection prevention areas, or domains. Additionally, the completion of Assessments can create invaluable opportunities to provide real-time teaching moments and increase HAI prevention awareness among staff. For further assistance, contact the CDC or your respective HIIN, QIN-QIO, or State Health Department to facilitate Assessment deployment, collection, and summarization.

*While NHSN TAP Reports are now available for MRSA in Acute Care Facilities, there is currently no TAP Facility Assessment available for MRSA. If you have any questions or would like to further discuss interventions to prevent MRSA bloodstream infections in acute care hospitals, please contact CDC at HAIPrevention@cdc.gov.

Target

Assess

Prevent

Prevent: Prioritize gaps using the Feedback Reports and access tools and resources within the Implementation Guides to address identified gaps

5. Implementing Infection Prevention Strategies

The TAP Excel Spreadsheets can be used to summarize results from the Facility Assessment Tools collected from staff members. Once all Assessments have been imported into the corresponding TAP Excel Spreadsheet, users can create a TAP Feedback Report to concisely summarize results and prioritize potential gaps. Most of the summary features within the Feedback Report will be automatically calculated and will aid in identifying domains and areas of improvement to address. An example Feedback Report is illustrated below.

Example
Catheter-associated Urinary Tract Infection (CAUTI) Facility Assessment Tool—Feedback Report

Date Range: 19	15	8.0	1.02	1.00	0.85	
Q2 2015 - Q2 2016	Number of healthcare facility-onset CAUTIs	Number of predicted healthcare facility-onset CAUTIs	Facility Cumulative Attributable Difference (CAD), or the number of infections the facility would have needed to prevent to achieve an HAI reduction goal SIR of 0.75	Healthcare facility-onset CAUTI Standardized Infection Ratio (SIR)	2014 National healthcare facility-onset CAUTI SIR	2014 State healthcare facility-onset CAUTI SIR
Assessment Overview			Leading*		Lagging†	
# Collected: 66			Senior leadership, unit-level leadership, and team/workgroup involvement in CAUTI prevention activities		Physician and Nurse Champions for CAUTI prevention activities	
# Analyzed: 66			Training, competency assessments, and routine audits of proper insertion and maintenance procedures		Confirm indwelling urinary catheter policies in ED; personnel should be aware of ED practices when receiving patients for admission	
Overall Mean Score: 38.0 out of 52, or 73%			Ordering of urinary catheters for appropriate indications, use of alternative strategies, and use of bladder scanners prior to insertion		Requirement of at least two personnel present for urinary catheter insertion	
Note: If this report represents fewer than 30 assessments, results may not be fully representative of the awareness and perceptions of infection prevention practices among healthcare personnel. Scoring and results are for the purpose of internal quality improvement and should not be used as a method to benchmark against other units or facilities.			Timely removal of catheters including documentation of removal date, and identification and daily review of patients with urinary catheters		Presence of facility leader responsible for antimicrobial stewardship activities	
Selected Deep Dives – Top Opportunities for Improvement ‡						
I. General Infrastructure	II. Appropriate Indications for Insertion	III. Aseptic Insertion	IV. Proper Catheter Maintenance	V. Timely Removal	VI. Appropriate Urine Culturing Practices	
Nurse champion for CAUTI prevention activities	Order provided in ED prior to insertion of an indwelling urinary catheter	Requirement of at least two personnel present for urinary catheter insertion	Use of pre-connected, sealed urinary catheter drainage systems	Daily review of patients with urinary catheters for continued need	Ordering of urine cultures only on patients with signs or symptoms of a urinary tract infection	
Feedback of CAUTI rates and/or standardized infection ratios (SIR)	Documentation of an indication when urinary catheters are ordered by ED providers		Personnel keep the urinary drainage system closed to maintain sterility	Use of alerts, reminders, or stop orders for urinary catheter removal		
	Ordering of urinary catheters for appropriate indications by ED providers			Removal of urinary catheters by nurses, if nurse-directed protocol in place		

Summarizes facility infection data

Summarizes overall 'Leading' and 'Lagging' items

Identifies specific gaps by domain.

Responses per question

VI. Appropriate Urine Culturing Practices						
Question	Never	Rarely	Sometimes	Often	Always	Unknown
1. Do ordering providers send urine cultures only on patients with signs or symptoms of a urinary tract infection?	0%	0%	0%	55%	45%	0%
2. If a urine culture is ordered, is a urinalysis ordered at the same time?	0%	0%	18%	67%	0%	15%
3. Are urine culture specimens transported to the lab for testing immediately following collection (i.e., not allowed to sit unrefrigerated for prolonged periods of time)?	36%	18%	0%	0%	30%	15%

Displays response frequencies per question and highlights potential gaps

Implementation strategies can then be customized to the particular gaps identified in the targeted locations. Partners can use the **TAP Implementation Guides** to access tools and resources to address their gaps. These guides are available for CAUTI, CLABSI, and CDI on the [TAP Website](https://www.cdc.gov/hai/prevent/tap.html) (<https://www.cdc.gov/hai/prevent/tap.html>) and align with the infection prevention domains within the TAP Facility Assessments and Feedback Reports. Each guide contains actionable resources partners can use to address their gaps.

- Data and Statistics +
- Types of Infections +
- Diseases and Organisms +
- Preventing HAIs -
- Targeted Assessment for Prevention (TAP) -
- TAP CAUTI Implementation Guide**
- TAP CDI Implementation Guide
- TAP CLABSI Implementation Guide
- Toolkits +
- Basic Infection Control and Prevention Plan for Outpatient Oncology Settings +
- Outpatient Care Guide

TAP Catheter-Associated Urinary Tract Infection (CAUTI) Implementation Guide: Links to Example Resources



Disclaimer: The links in the domains below are not mutually exclusive nor do they represent an exhaustive list of all the possible resources available. Furthermore, the links presented do not constitute an endorsement of these organizations or their programs by the Centers for Disease Control and Prevention (CDC) or the federal government, and none should be inferred.

See also the [CDC Guideline for Prevention of Catheter-Associated Urinary Tract Infections 2009](#) [PDF - 407 KB]

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)
- [CAUTI Cost Calculator](#)
- Tool to engage leadership that estimates facility costs due to CAUTI, from catheterout.org
- [Implementation Team Roles and Responsibilities](#) [PDF - 1 page]
- Summary of recommended personnel to engage for CAUTI reduction efforts, from catheterout.org
- [CUSP Board Checklist](#)



For more information about how your facility can utilize the TAP Strategy, visit the TAP website:

<http://www.cdc.gov/hai/prevent/tap.html>

For technical assistance in implementing the TAP Strategy, contact local partners in prevention including HIINs, QIN-QIOs, your State Health Department, or contact the CDC at HAIPrevention@cdc.gov

	Tools	Location
Target	TAP Reports	NHSN Patient Safety Component: https://www.cdc.gov/nhsn/pdfs/pscmanual/pscmanual_current.pdf
	TAP Infographic	TAP Infographic: https://www.cdc.gov/hai/pdfs/tap/TAP-Infographic-P.pdf
	NHSN Guidance	NHSN Website: https://www.cdc.gov/nhsn/
Assess	TAP Facility Assessments	TAP Website: http://www.cdc.gov/hai/prevent/tap.html
	TAP Excel Spreadsheets	Email HAIPrevention@cdc.gov
	TAP Tool Guide	Email HAIPrevention@cdc.gov
Prevent	TAP Feedback Report	Component of TAP Excel Spreadsheets
	TAP Facility Prevention Prioritization Toolkit	TAP Website: http://www.cdc.gov/hai/prevent/tap.html
	TAP Implementation Guides	TAP Website: http://www.cdc.gov/hai/prevent/tap.html

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.

$$CAD = Observed - (Predicted * SIRgoal)$$

In a TAP Report, the parentheses contain CADs for specific location types. 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 2020 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

MRSA: 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 Rank (facRank): Facilities within a group are ranked from the highest to lowest based on their CAD

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

Type of Affiliation (medType): This code represents medical school affiliation for a facility, as reported to NHSN. If blank, facility is a non-teaching hospital.

M - Major: Facility has a program for medical students and post-graduate medical training.

G - Graduate: Facility has a program for post-graduate medical training (i.e., residency and/or fellowships).

U - Undergraduate: Facility provides training program(s) for medical students only.

Number of Beds (numBeds): The number of beds set up and staffed, as reported to NHSN.

Number of Locations (numLoc): Overall number of locations listed in the aggregate facility grouping. In parentheses, the counts for specific location types are broken out

I: Number of Intensive Care Units

N: Number of Neonatal intensive Care Units

W: Number of Ward+ (any unit that is not ICU or NICU)

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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.

Device Days/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. [Your Guide to the Standardized Infection Ratio \(SIR\)](#) [PDF-14 pages] (http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_OCT_2010SE_final.pdf) explains this ratio in more detail.

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

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.

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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	$\text{SIR} = \frac{\text{Observed}}{\text{Predicted}}$	Used as a <i>comparative</i> 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.	$\text{CAD} = \text{Observed} - (\text{Predicted} * \text{SIRgoal})$	Used as a <i>prioritization</i> metric to identify the facilities and units with the highest burden of excess infections. Targeting these locations may 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.

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