California Hospital Internal Data Validation

Overview, Instructions, and Validation Forms

August 2022

California Department of Public Health
Healthcare-Associated Infections Program

Preface

This workbook contains all necessary information, instructions, and forms needed by hospital infection prevention program staff to successfully complete the CDPH HAI Program Validation process for 2022.

Important Acronyms and Abbreviations

CDI	*C. difficile* diarrheal infection
CLABSI	Central line-associated bloodstream infection
CDPH	California Department of Public Health
COLO	Colon procedure
CSEC	Cesarean Section Procedure
HAI	Healthcare-Associated Infection
HYST	Abdominal hysterectomy procedure
IP	Infection Preventionist
LIS	Laboratory Information System
MRSA	Methicillin-resistant *S. aureus*
NHSN	National Healthcare Safety Network
SSI	Surgical site infection
VRE	Vancomycin-resistant enterococcus species

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Overview

The CDPH HAI Program is offering data validation in 2022 to help hospitals assess completeness of HAI case finding for CDI, CLABSI, bloodstream infections due to MRSA and VRE, and SSIs. This data validation has three objectives:

1. Gain a better understanding of hospital surveillance processes for case finding
2. Assess understanding and application of NHSN protocols and definitions
3. Improve quality and consistency of HAI surveillance and reporting

Hospitals can benefit from all objectives of the validation process. Past validation projects have shown incomplete case finding in many California hospitals. By assessing HAI case finding in 2022, hospital infection prevention program staff will be able to review and refine their surveillance practices, as well as correct reporting errors discovered during validation.

Validation Support

While validation is self-directed, guidance is available from the HAI Program Hospital Support Team, a multidisciplinary group based in our Richmond office with expertise in HAI data, reporting, surveillance, and prevention. They can be reached at HAIProgram@cdph.ca.gov

While validation is a voluntary process, hospital participation or nonparticipation and follow up will be noted in the annual CDPH HAI public report. Attestation that your hospital has completed the validation and a summary of your 2022 validation results will be requested from each participating facility via an online survey.

Timeline

August 9, 11, 15, 19	Validation Webinars
August 10	Validation workbook and online results form released; Ongoing support from HAI Program
October 14	Deadline to enter results in online form and attest to participation
October – November	Correct data from 1st and 2nd quarters of 2022 based on validation findings
January 2023	Analysis of results and follow up as necessary by CDPH HAI Program

PREPARING FOR VALIDATION

The following reports should be prepared in advance for use during the validation process. (*Please note that data mining software programs are not appropriate for generating the type of information needed for this process.*)

For CLABSI, MRSA BSI and VRE BSI validation:
1. Generate a report from your LIS containing all final positive blood cultures during the first and second quarters of 2022 (January 1 June 30) from all inpatients and emergency department patients. This list should include:
   a. Patient name and/or medical record number
   b. Organism identified
   c. Date of specimen collection
   d. Location at the time of collection
   e. Date of admission

2. Sorting this list by patient name or medical record number.

3. Number each event and randomly select 20 to review.

4. Using NHSN, generate an Event line list during the **first two quarters of 2022** (Jan 1 - June 30). This list should include:
   a. Patient name and/or medical record number
   b. Organism identified
   c. Date of specimen collection
   d. Location at the time of collection
   e. Date of admission

For CDI validation:
1. Generate a report from your LIS containing all positive *C. difficile* test results (assays or PCR) during the first and second quarters of 2022 (January 1 June 30) from all inpatients and emergency department patients, including:
   a. Patient name or medical record number
   b. Date of specimen collection
   c. Location at the time of collection
   d. Date of admission

2. Sorting this list by patient name or medical record number is highly recommended.

3. Using NHSN, generate an Event line list during the **first two quarters of 2022** (Jan 1 - June 30). This list should include:
   a. Patient name and/or medical record number
   b. Date of specimen collection
   c. Location at the time of collection
   d. Date of admission

For SSI Validation:

1. Identify all patients who had each of the three inpatient procedures (COLO, CSEC, HYST) performed in the first and second quarters of 2022 (January 1 June 30). To do this, perform a "look back" using hospital billing data to find all patients with an NSHN defined ICD10 surgical procedure code (PDF) (www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf)

2. Save these procedure lists for your reference. Ensure every procedure identified has been reported to NHSN.

3. For each patient identified in STEP 1, use hospital billing data to identify the subset of patients that had one or more ICD diagnosis "flag" codes (Table 1) during the specified postoperative period. These flag codes identify patients that MIGHT have had an SSI and help determine which medical records to review for validation.

4. Your billing or medical records office needs to query the billing data to look for diagnosis flag codes during the index surgical admission and any admission up to:
   - **40 days** after surgery for <u>colon, abdominal, hysterectomy, and cesarean section</u>
     - Note: This would include a review up to 8/9/2022 if a surgery was performed on the final day of the second quarter (i.e., 6/30/2022)

Table 1: ICD10 Diagnosis "Flag" Codes by Surgery Type

Colon Surgery	Abdominal Hysterectomy	Cesarean Section
K63.0, K63.2, K65.0, K65.1, K68.19, K94.02, K94.12, L03.319, T81.31XA, T81.32XA, T81.42XA, T81.43XA T81.83XA	K65.0, K65.1, L03.319, T81.31XA, T81.32XA, T81.42XA T81.43XA	K65.0 K65.1 L03.319 T81.31XA T81.32XA T81.42XA T81.43XA

5. Create a separate line list for each procedure (one list for each procedure type) from the procedures identified in step 3. Sort the lists by patient name or medical record number. The lists should contain the following:
   a. Patient name and/or medical record number
   b. The ICD code or codes flagging the record
   c. Original procedure date
   d. Discharge date of the original procedure
   e. Date of readmission (if applicable)

6. Using NHSN, generate an SSI Event line list for each procedure type (or a single list sorted by procedure type) during the **first two quarters of 2022** (Jan 1 – Jun 30).

CLABSI VALIDATION INSTRUCTIONS

STEP 1: Refer to the report generated from your laboratory information system containing all final positive blood cultures during the first and second quarters of 2022 (January 1June 30) from all inpatients and emergency department patients. Also refer to the NHSN line list of CLABSI Events reported by your hospital for the 6month validation review period (January - June 2022).

STEP 2: Using the lab line list sorted by name, number each positive blood culture on your lab line list as 1, 2, etc. (number each one individually, not as BSI events or clusters)

To determine which blood cultures to review:
- If the number of blood cultures is **>0 and ≤20**, number all blood cultures 1 through 20 (as appropriate)
- If the number of blood cultures is **>20**, divide the total by 20, and select every nth event for review, numbering 1 through 20

STEP 3: Indicate the total number of positive blood cultures _____

Indicate the number of positive, separate BSI events* _____ [Include in CLABSI Review]

 *Event = "Cluster" of positive blood cultures near same date for same patient counts as 1 event; single positive blood cultures also count as 1 event

STEP 4: Add each positive culture (e.g., 1, 2) to the corresponding CLABSI Validation Form in Appendix B, and also include the date the specimen was collected.
For CLABSI validation, enter data in Form 1

STEP 5: From your lab line list, for **each** positive blood culture, fill in the hospital unit of the patient when the test was sent.

STEP 6: For each numbered blood culture, answer Q1 by referring to your NHSN line list. For cases reported to NHSN, record the NHSN Event number.

STEP 7: Using the patient information on the lab line list (i.e-., name or medical record number), for each numbered blood culture, review each patient's medical record to verify your decision to report each case, or not report it, to NHSN. Carefully follow NHSN CLABSI protocols/definitions.

- For each blood culture **NOT** reported to NHSN (i.e., <u>Q1 answer is No</u>), indicate the reason why in the appropriate column. If the case should have been reported but was not, record it as missed and provide a reason.
- For each blood culture **Reported** to NHSN (i.e., <u>Q1 answer is Yes</u>), verify if the case met inpatient CLABSI criteria. If each case does meet the criteria, compare the specimen date, admission, and location as reported on the NHSN line list in order to verify accuracy. Next, check the box indicating the case was correctly reported. If the case was **reported in error**, indicate a reason for the error in the appropriate column.

STEP 8: Sum the columns and keep this form on hand as it will be used to populate the Summary of Findings form.

MRSA AND VRE VALIDATION INSTRUCTIONS

STEP 1: Refer to the report generated from your laboratory information system containing all final positive blood cultures during the first and second quarters of 2022 (previously used for CLABSI validation). Also refer to the NHSN line list of MRSA & VRE BSI Events reported by your hospital for the 6 month validation review period (January-June 2022).

STEP 2: Using the lab line list sorted by name, number each positive MRSA blood culture on your lab line list as M1, M2, M3, etc. (number each one individually, not as BSI events or clusters).

To determine which blood cultures to review:
- If the number of blood cultures is **>0 and ≤20**, number all blood cultures 1 through 20 (as appropriate)
- If the number of blood cultures is **>20**, divide the total by 20, and select every nth event for review, numbering 1 through 20

STEP 3: Using the lab line list sorted by name, number each positive VRE blood culture on your lab line list as V1, V2, V3, etc. (number each one individually, not as BSI events or clusters).

STEP 4: From the positive **blood cultures**, indicate:

    The total number of MRSA positive blood cultures_____ [Include in MRSA BSI Review]
    The total number of VRE positive blood cultures _____ [Include in VRE BSI Review]

STEP 5: Add each positive culture (e.g., M1, M2; V1, V2) to the corresponding MRSA BSI and VRE BSI Validation Forms in Appendix B, and also include the date the specimen was collected:

    For MRSA positive blood cultures, enter data in Form 2
    For VRE positive blood cultures, enter data in Form 3

STEP 6: From your lab line list, for **each** MRSA and VRE positive blood culture, fill in the hospital unit of patient when the test was sent.

STEP 7: For each numbered blood culture below, answer Q1 by referring to your NHSN line list. For cases reported to NHSN, record the NHSN Event number.

STEP 8: Using the patient information on the lab line list (i.e. name or medical record number), for each numbered blood culture, review each patient's medical record to verify your decision to report each case, or not report it, to NHSN. Carefully follow NHSN MDRO LabID protocols/definitions.
- o For each blood culture **NOT** reported to NHSN (i.e., <u>Q1 answer is No</u>), indicate the reason why in the appropriate column. If the case should have been reported but was not, record it as missed and provide a reason.
- o For each blood culture **Reported** to NHSN (i.e., <u>Q1 answer is Yes</u>), verify if the case met inpatient LabID criteria. If each case does meet the MDRO LabID criteria, compare the specimen date, admission, and location as reported on the NHSN line list in order to verify accuracy. Next, check the box indicating the case was correctly reported. If the case was reported in error, indicate a reason for the error in the appropriate column.

STEP 9: Sum the columns and keep this form on hand as it will be used to populate the Summary of Findings form.

Updated 100/3/2022

CDI VALIDATION INSTRUCTIONS

STEP 1: Refer to the report generated from your laboratory information system containing all positive *C. difficile* test results (assays or PCR) during the first and second quarters of 2022 (January 1 June 30) from all inpatients and emergency department patients. Also refer to the NHSN line list of CDI Events reported by your hospital for the 6month validation review period (January - June 2022).

STEP 2: Using the lab line list sorted by name, number each positive *C. difficile* test result on your lab line list as C1, C2, C3, etc. (number each one individually, not as BSI events or clusters).

To determine which positive results to review:
- If the number of positive results is **>0 and ≤20**, number all blood cultures 1 through 20 (as appropriate)
- If the number of positive results is **>20**, divide the total by 20, and select every nth event for review, numbering 1 through 20

STEP 3: Indicate the total number of positive *C. difficile* test results _____ [Include in CDI Review]

STEP 4: Add each positive result (e.g., C1, C2) to the corresponding CDI Validation Form in Appendix B, and also include the date the specimen was collected:

> For CDI results, enter data in Form 4

STEP 5: From your lab line list, for **each** CDI test result, fill in the hospital unit of patient when the test was sent.

STEP 6: For each numbered test result below, answer Q1 by referring to your NHSN line list. For cases reported to NHSN, record the NHSN Event number.

STEP 7: Using the patient information on the lab line list (i.e. name or medical record number), for each numbered test result, review each patient's medical record to verify your decision to report each case, or not report it, to NHSN. Carefully follow NHSN protocols/definitions.
- For each positive culture **NOT** reported to NHSN (i.e., Q1 answer is No), indicate the reason why in the appropriate column. If the case should have been reported but was not, record it as missed and provide a reason.

- For each positive culture **Reported** to NHSN (i.e., Q1 answer is Yes), verify if the case met inpatient LabID criteria. If each case does meet the LabID criteria, compare the specimen date, admission, and location as reported on the NHSN line list in order to verify accuracy. Next, check the box indicating the case was correctly reported. If the case was reported in error, indicate a reason for the error in the appropriate column.

STEP 8: Sum the columns and keep this form on hand as it will be used to populate the Summary of Findings form.

SSI VALIDATION INSTRUCTIONS

The 2022 SSI data validation has two objectives:
1. Assess surveillance practices to improve SSI case finding
2. Assess the accuracy of surgical denominator data elements reported to NHSN

Hospitals can benefit from both objectives of the validation process. Past validation projects have shown incomplete case finding in many California hospitals. By assessing SSI case finding in 2022, hospital infection prevention program staff will be able to review and refine their surveillance practices, as well as correct reporting errors discovered during validation.

Denominator data elements are known risk factors for surgical site infections and are used for risk adjustment when NHSN calculates standardized infection ratios (SIR). Reporting accurate denominator data elements allows NHSN to calculate more accurate SSI SIRs for your hospital. SSI validation will allow hospital staff to better assess their true SSI incidence, which is critical to measuring progress over time and directing prevention activities with greater confidence. The processes are designed to be easily incorporated into regular surveillance practices, so hospitals can sustain the gains made from validation.

Validation Process Summary
- List all colon surgery, abdominal hysterectomy, and cesarean section procedures performed in the first two quarters of 2022.
- Use postoperative ICD diagnosis "flag" codes to identify records with high likelihood of SSI for review (max. 40 records, likely fewer)
- Review all identified records for SSI
- Review the following denominator data elements for accuracy for all three procedures:
  - Surgical duration
  - Body Mass Index (BMI)
  - Wound Class
- Complete Validation Forms 5 – 7 in Appendix B
- Record final results and perform calculations in "Summary of Findings" section
- Submit data from Summary of Findings to the CDPH HAI Program via online submission form

In this section refer to the three flagged procedure lists and the SSI Event line lists produced in STEP 3 & STEP 4 of Preparing for Validation. You will also need to refer to NHSN procedure data.

STEP 1: To determine which procedures to review, for EACH of the three flagged procedure lists
- If the number of flagged procedures is **>0 and ≤10**, number all flagged procedures 1 through 10 (as appropriate)
- If the number of flagged procedures is **>10**, divide the total by 10, and select every n^{th} event for review, numbering 1 through 10

Note: If the total number of records flagged for review (across all three procedure types) are less than 20, complete Denominator Data Supplemental Validation Form 8 in Appendix B.

STEP 2: Record the following data. You will include this in the Review of Findings section at the end of this workbook and report these numbers to the CDPH HAI Program. (Do not include procedures from optional validation form here)

	Total number of procedures in first two quarters of 2022	Number of procedures identified through ICD "flag" codes	Number of procedures reviewed during validation
COLO			
HYST			
CSEC			

STEP 3: Add each procedure identified and numbered in STEP 1 to the corresponding SSI validation form in Appendix B, filling in applicable information (date of surgery, etc.).

- Enter COLO SSI data in Form 5
- Enter HYST SSI data in Form 6
- Enter CSEC SSI data in Form 7

STEP 4: For each procedure numbered in STEP 1, review each patient's medical record to verify your decision to report or not report an SSI to NHSN. Carefully follow NHSN protocols/definitions as defined in Chapter 9 of the Patient Safety Component Manual. Refer to the SSI Event line list and NHSN procedure data where necessary.

Complete the following sections in Forms 5 – 7.
- Was NHSN SSI criteria met? (If yes, indicate superficial, deep or organ/space SSI)
- Was SSI reported to NHSN? (If yes, indicate NHSN Event #)
- Was an SSI **Reported Correctly**? (i.e., the event met NHSN SSI criteria and was reported as an SSI prior to validation.)
- For those records where no SSI was reported to NHSN, indicate if:
  - Event **did not meet NHSN criteria**
    OR
  - SSI was **MISSED** (i.e. did meet NHSN SSI criteria but was not reported)
- Record selected denominator data elements for each procedure type using both patient medical records and NHSN procedure data.
  - Note: To locate denominator data in NHSN you may choose to look up individual procedure records directly in NHSN. Another option is to produce an NHSN procedure line list with all necessary elements. Detailed instructions for doing this are available in Appendix C.
- Indicate if the denominator data were reported accurately (Table 2)

Table 2: Criteria for accurate reporting

Data Element:	Accurate if:
Duration	< 10 minutes discrepancy
Wound class	Wound classes agree
BMI	< 1.0 BMI unit discrepancy

STEP 5: Total the columns indicated at the bottom of each form. Keep this form on hand as it will be used to populate the Summary of Findings section.

STEP 6: Follow instructions in the Summary of Findings section to fill in the tables. We recommend populating each row in its entirety before continuing on in order to ensure data are reported for the correct procedure type. The tables and forms are color coded for your convenience. Calculations can be rounded to the nearest whole number.

STEP 7: Submit your results from the Summary of Findings section to the CDPH HAI Program via an online form. The link to the form will be made available September 1, 2022.

2022 Validation – Summary of Findings

CLABSI, LabID Data

Type of HAI	Number of Missed HAI events That Were Identified during Validation (Note: Report to NHSN) A	Number of HAI events That had Already Been Correctly Reported to NHSN Prior to Validation B	Total Number of HAI events Reviewed During Validation That Meet NHSN Definitions Sum: A+B = C	Case finding Percentage (B/C) x 100%
Example	2 A	16 B	2 + 16 = 18 C	16 /18 x 100% = 89%
CLABSI	A	B	C	
MRSA BSI	A	B	C	
VRE BSI	A	B	C	
CDI	A	B	C	

SSI HAI Data

Procedure Type	No. Of SSIs REPORTED Correctly to NHSN prior to validation A	No. where NO SSI reported & event did NOT meet NHSN criteria B	No. of MISSED SSIs identified during validation C	Total SSIs reviewed during validation that meet NHSN criteria Sum: A+C=T	Case finding Percentage (A/T)) x 100%
Example	3 A	5 B	1 C	3 + 1 = 4 T	3 /4 x 100% = 75%
SSI COLO	A	B	C	T	
SSI HYST	A	B	C	T	
SSI CSEC	A	B	C	T	

2022 Validation – Summary of Findings

Summary of Surgical Denominator Data Elements

Report the number of procedures reviewed during validation (N) for each procedure type. Use the totals from the SSI Validation Forms in Appendix A (Forms 5 7), as well as the Supplemental Form 8 (if applicable) to fill in the indicated cells (marked D & E). Cells marked N/A are not applicable; write nothing in these. Calculate the percentage of surgical procedures with accurately reported denominator data using formulas below.

Procedure	No. of procedures reviewed during validation	BMI		Duration		Wound Class	
		No. where BMI agree	Percent with BMI	No. where duration agree (Discrepancy <10 min.)	Percent with accurate duration	No. where wound class agree	Percent with accurate wound class
	N	D	D/N x 100%	E	E/N x 100%	F	F/N x 100%
Example:	9	7	7/9 x 100% = 78%	8	8/9 x 100% = 89%	5	5/9 x 100%=56%
COLO	N	D		E		F	
HYST	N	D		E		F	
CSEC	N	D		E		F	
Supplemental Form	N	D		E		F	

Save this form; results will be submitted to the CDPH HAI Program via an online form

Next Steps

- Enter your Summary of Findings (pages 13-15) into the [online survey tool](www.surveymonkey.com/r/InternalValidationCDPH) (www.surveymonkey.com/r/InternalValidationCDPH).

- Ensure the surveillance methods used during validation to identify and verify missed cases of HAIs during the first half of 2022 will be incorporated into ongoing surveillance practices.

- Hospitals with less than 85% case finding in a specific HAI category may want to consider repeating the validation process for the HAI using data from the third and fourth quarters of 2022.

- External validation will be conducted for a select number of hospitals during the fourth quarter of 2022.

- Data will be aggregated and analyzed and results communicated on regional hospital IP calls and to the California HAI Advisory Committee.

- Individualized validation reports to be shared with each hospital.

Appendix A: Denominator Data Element Definitions

This appendix contains explanations of the three denominator data elements being validated in 2022: duration, wound class, and BMI. Any text that appears in a box is a direct quote from Chapter 9 of the NHSN Patient Safety Component Manual. All other text is added by CDPH HAI Program staff for clarity.

Duration

The NHSN Patient Safety Component Manual definition for this element is:

Duration of operative procedure: The interval in hours and minutes between the Procedure/Surgery Start Time, and the Procedure/Surgery Finish Time, as defined by the Association of Anesthesia Clinical Directors (AACD):
- Procedure/Surgery Start Time (PST): Time when the procedure is begun (e.g., incision for a surgical procedure).
- Procedure/Surgery Finish (PF): Time when all instrument and sponge counts are completed and verified as correct, all postoperative radiologic studies to be done in the OR are completed, all dressings and drains are secured, and the physicians/surgeons have completed all procedure related activities on the patient.

For validation purposes, duration recorded in NHSN and duration determined from medical record review should match exactly or have less than a 10 minute discrepancy in order to report "durations agree." The 10minute discrepancy criterion was chosen for its relevance in risk adjustment models.

Wound Class

The NHSN Patient Safety Component Manual definition for this element is:
Wound class: An assessment of the degree of contamination of a surgical wound at the time of the operation. Wound class should be assigned by a person involved in the surgical procedure (e.g., surgeon, circulating nurse, etc.). The wound class system used in NHSN is an adaptation of the American College of Surgeons wound classification schema.

There are a group of NHSN procedures that can never be coded as clean. NHSN reached the decision regarding which NHSN operative procedures can never be classified as clean based on feedback from external experts in the field of surgery.

The procedures that can never be entered as clean are: APPY, BILI, CHOL, COLO, REC, SB and VHYS. Therefore, for these procedures in the application clean is not an option on the dropdown menu.

For all other procedures clean is available as a choice and if the surgical team deems the procedure to be clean it can be entered as such into the NHSN application. For example, HYST, CSEC or OVRY can be a clean wound class if documented as such. Wounds are divided into four classes:

1. **Clean**: An uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tracts are not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow nonpenetrating (blunt) trauma should be included in this category if they meet the criteria.
   Note: The clean wound classification level will not be available for denominator data entry for the following NHSN operative procedure categories: APPY, BILI, CHOL, COLO, REC, SB, and VHYS

2. **Clean-Contaminated**: Operative wounds in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.

3. **Contaminated**: Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, non-purulent inflammation is encountered including necrotic tissue without evidence of purulent drainage (e.g., dry gangrene) are included in this category.

4. **Dirty or Infected**: Includes old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

5. **For validation purposes**, wound class recorded in NHSN and wound class determined from medical record review should match exactly in order to report "wound classes agree."

Body Mass Index (BMI)

BMI is a data element calculated by NHSN using data entered in the height and weight field.

The NHSN Patient Safety Component Manual definitions for these elements are:

> <u>Height</u>: The patient's most recent height documented in the medical record in feet (ft.) and inches (in), or meters (m).
>
> <u>Weight</u>: The patient's most recent weight documented in the medical record in pounds (lbs.) or kilograms (kg) prior to or otherwise closest to the procedure.

BMI may be automatically calculated in hospital electronic medical records or recorded directly by hospital staff. If the **most recent BMI** at the time of surgery is not available it may need to be calculated. Below are two options for calculating BMI:

1. **Use an online BMI calculator:**
    If you are at a computer with internet access the easiest option is to use the [BMI calculator](www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi-m.htm) (www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi-m.htm)
    (Note: The metric BMI calculator asks for height in centimeters. If only meters are available, multiply by 100 to get centimeters.)

OR

2. **Calculate by hand:**

English Formula	Metric formula
$BMI = \left(\frac{weight(lb)}{height(in)^2}\right) x\ 703$	$BMI = \frac{weight(kg)}{height(m)^2}$
Example: Weight = 165 lbs Height = 5'7" (67")	Example: Weight = 74.8 kg Height = 170 cm (1.7 m)
$\frac{165}{(67)^2} x\ 703 = 25.8$	$\frac{74.8}{(1.70)^2} = 25.9$
Note: If height is given in feet and inches, multiply feet by 12 and add remaining inches.	Note: If height is only available in centimeters, divide height by 100 to get height in meters.

For validation purposes, BMI recorded in NHSN and BMI determined from medical record review should match exactly or have less than 1.0 BMI unit discrepancy in order to report "BMI agree." Less than 1.0 unit discrepancies are permitted as variations in calculations may result in slightly different BMIs.

Appendix B: Reporting Forms

CLABSI Validation Form 1 *When the review is complete, please make all necessary corrections to your data in NHSN*

Lab List No.	Date of first positive blood culture of BSI Event:	Admit Date:	Hosp. Unit of patient when test was sent:	Q1. Was Event reported to NHSN as a CLABSI? YES	NHSN Event #	NO	NO central line >2d Or line not in place day of event or previous day	Present on admission (and not discharged in previous 2 days)	Contaminant i.e. Common skin commensals Single +bld cx	2 +bld cx w/ in 2d but no S/S	Secondary BSI Primary site of infection	Met CLABSI Exclusion Criteria	MISSED Should have been reported:	If Q1 answer is YES but event was reported in ERROR: Not a CLABSI	If Q1 answer is YES and event was **Reported Correctly**, check box below:
							If Q1 answer is NO, complete this section:							
1				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
14				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
15				☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
												Total Missed A:	Tot. Correct	B:	

MRSA Validation Form 2

When the review is complete, please make all necessary corrections to your data in NHSN

Lab List No.	MRSA positive blood specimen date:	Admit Date	Hospital Unit of patient when test was sent:	Q1. Was MRSA Event reported to NHSN?			If Q1 answer is NO, complete this section:		If Q1 answer is YES but event was reported in ERROR, complete section: Does not meet inpatient Lab ID criteria:	If Q1 answer is YES and event was **Reported Correctly**, check box below:
							Duplicate <14 days since last positive:	**MISSED** Should have been reported:		
				YES	NHSN Event #	**NO**				
M1				☐		☐	☐	☐	☐	☐
M2				☐		☐	☐	☐	☐	☐
M3				☐		☐	☐	☐	☐	☐
M4				☐		☐	☐	☐	☐	☐
M5				☐		☐	☐	☐	☐	☐
M6				☐		☐	☐	☐	☐	☐
M7				☐		☐	☐	☐	☐	☐
M8				☐		☐	☐	☐	☐	☐
M9				☐		☐	☐	☐	☐	☐
M10				☐		☐	☐	☐	☐	☐
M11				☐		☐	☐	☐	☐	☐
M12				☐		☐	☐	☐	☐	☐
M13				☐		☐	☐	☐	☐	☐
M14				☐		☐	☐	☐	☐	☐
M15				☐		☐	☐	☐	☐	☐
							Total Missed	A:	Total Correct	B:

VRE Validation Form 3

When the review is complete, please make all necessary corrections to your data in NHSN

Lab List No.	VRE positive blood specimen date:	Admit Date	Hospital Unit of patient when test was sent:	Q1. Was VRE Event reported to NHSN?			If Q1 answer is NO, complete this section:		If Q1 answer is YES but event was reported in ERROR, complete section: Does not meet inpatient Lab ID criteria:	If Q1 answer is YES and event was **Reported Correctly**, check box below:
				YES	NHSN Event #	**NO**	Duplicate <14 days since last positive:	**MISSED** Should have been reported:		
V1				☐		☐	☐	☐	☐	☐
V2				☐		☐	☐	☐	☐	☐
V3				☐		☐	☐	☐	☐	☐
V4				☐		☐	☐	☐	☐	☐
V5				☐		☐	☐	☐	☐	☐
V6				☐		☐	☐	☐	☐	☐
V7				☐		☐	☐	☐	☐	☐
V8				☐		☐	☐	☐	☐	☐
V9				☐		☐	☐	☐	☐	☐
V10				☐		☐	☐	☐	☐	☐
V11				☐		☐	☐	☐	☐	☐
V12				☐		☐	☐	☐	☐	☐
V13				☐		☐	☐	☐	☐	☐
V14				☐		☐	☐	☐	☐	☐
V15				☐		☐	☐	☐	☐	☐
							Total Missed	A:	Total Correct	B:

22

CDI Validation Form 4
When the review is complete, please make all necessary corrections to your data in NHSN

Lab List No.	Positive *C. difficile* specimen date:	Admit Date	Hospital Unit of patient when test was sent:	Q1. Was CDI Event reported to NHSN?			If Q1 answer is NO, complete this section		If Q1 answer is YES but event was reported in ERROR, complete this section: Does not meet inpatient Lab ID criteria:	If Q1 answer is YES and event was **Reported Correctly**, check box below:
				YES	NHSN Event #	**NO**	Duplicate <14 days since last positive:	**MISSED** Should have been reported:		
C1				☐		☐	☐	☐	☐	☐
C2				☐		☐	☐	☐	☐	☐
C3				☐		☐	☐	☐	☐	☐
C4				☐		☐	☐	☐	☐	☐
C5				☐		☐	☐	☐	☐	☐
C6				☐		☐	☐	☐	☐	☐
C7				☐		☐	☐	☐	☐	☐
C8				☐		☐	☐	☐	☐	☐
C9				☐		☐	☐	☐	☐	☐
C10				☐		☐	☐	☐	☐	☐
C11				☐		☐	☐	☐	☐	☐
C12				☐		☐	☐	☐	☐	☐
C13				☐		☐	☐	☐	☐	☐
C14				☐		☐	☐	☐	☐	☐
C15				☐		☐	☐	☐	☐	☐
							Total Missed	A:	Total Correct	B:

Colon SSI Validation Form 5

When the review is complete, please make all necessary corrections to your data in NHSN

COLON Procedure List No.	Date of Surgery (MM/DD)	Discharge date of index surgery (MM/DD)	Indicate which postop ICD code(s) " flagged" this patient record	Readmitted within NHSN specified number of days of index surgery	Was NHSN SSI criteria met?	SSI was **Reported Correctly** (SSI met criteria & reported to NHSN) Yes	No	If NO SSI reported, complete this section — Event **did not meet NHSN criteria**	SSI was **MISSED** (SSI met criteria & should have been reported)	BMI — BMI as reported to NHSN (to the nearest tenth xx.x)	BMI from validation medical record review (to the nearest tenth XX.X)	BMI **agree** (Discrepancy < 1.0 unit)	Duration — Duration as reported to NHSN	Duration from validation medical record review	Duration **agree**	Wound Class — Wound class as reported to NHSN	Wound class from validation medical record review	Wound class **agree**
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				☐	☐	☐	☐	☐	☐			☐			☐			☐
COLO Total:				A:				B:	C:			D:			E:			F:

Abdominal Hysterectomy SSI Validation Form 6

When the review is complete, please make all necessary corrections to your data in NHSN

HYST Procedure List No.	Date of Surgery (MM/DD)	Discharge date of index surgery (MM/DD)	Indicate which postop ICD code(s) "flagged" this patient record	Readmitted within NHSN specified number of days of index surgery	Was NHSN SSI criteria met?	SSI was **Reported Correctly** (SSI met criteria & reported to NHSN)		If NO SSI reported, complete this section		BMI			Duration			Wound Class		
								Event **did not meet NHSN criteria**:	SSI was **MISSED** (SSI met criteria & should have been reported)	BMI as reported to NHSN (to the nearest tenth xx.x)	BMI from validation medical record review (to the nearest tenth XX.X)	BMI **agree** (Discrepancy < 1.0 unit)	Duration as reported to NHSN	Duration from validation medical record review	Duration **agree**	Wound class as reported to NHSN	Wound class from validation medical record review	Wound class **agree**
						Yes	No											
				☐	☐	☐	☐	☐	☐			☐			☐			☐
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			HYST Total:		A:			B:	C:			D:			E:			F:

Cesarean Section SSI Validation Form 7
When the review is complete, please make all necessary corrections to your data in NHSN

CSEC Procedure List No.	Date of Surgery (MM//DD)	Discharge date of index surgery (MM/DD)	Indicate which postop ICD code(s) " flagged" this patient record	Readmitted within NHSN specified number of days of index surgery	Was NHSN SSI criteria met?	SSI was **Reported Correctly** (SSI met criteria & reported to NHSN) Yes	No	If NO SSI reported, complete this section — Event **did not meet NHSN criteria**	SSI was **MISSED** (SSI met criteria & should have been reported)	BMI — BMI as reported to NHSN (to the nearest tenth xx.x)	BMI from validation medical record review (to the nearest tenth XX.X)	BMI **agree** (Discrepancy < 1.0 unit)	Duration — Duration as reported to NHSN	Duration from validation medical record review	Duration **agree**	Wound Class — Wound class as reported to NHSN	Wound class from validation medical record review	Wound class **agree**
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				☐	☐	☐	☐	☐	☐			☐			☐			☐
				CSEC Total:		A:		B:	C:			D:		E:			F:	

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Denominator Data Supplemental Validation – Form 8
When review is complete, please make all necessary corrections to your data in NHSN

If you have validated less than 20 total records, or if you desire, complete this **Suppl.** validation form.
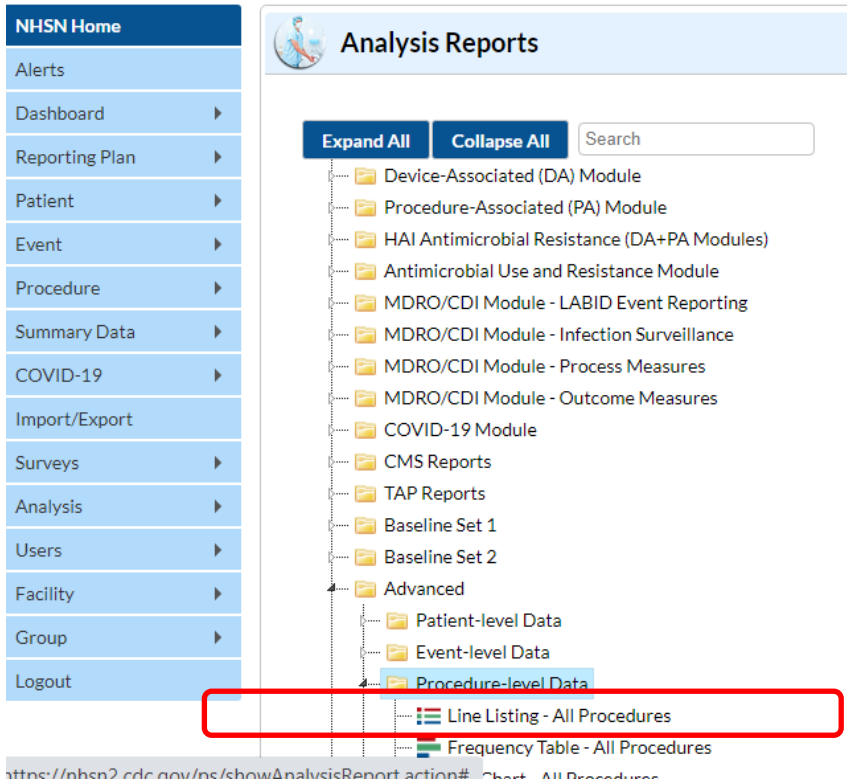
Instructions
1. Use the lists of procedures produced in STEP 1 of "Preparing for Validation.
2. Randomly select up to 10 procedures.
3. Look up and record all three denominator data elements as reported to
4. NHSN. Look up and record corresponding data from medical records.
5. Indicate where data agree.
6. Total the number of validated procedures and the number that agree for each data element.
7. Report totals in "Review of Findings."

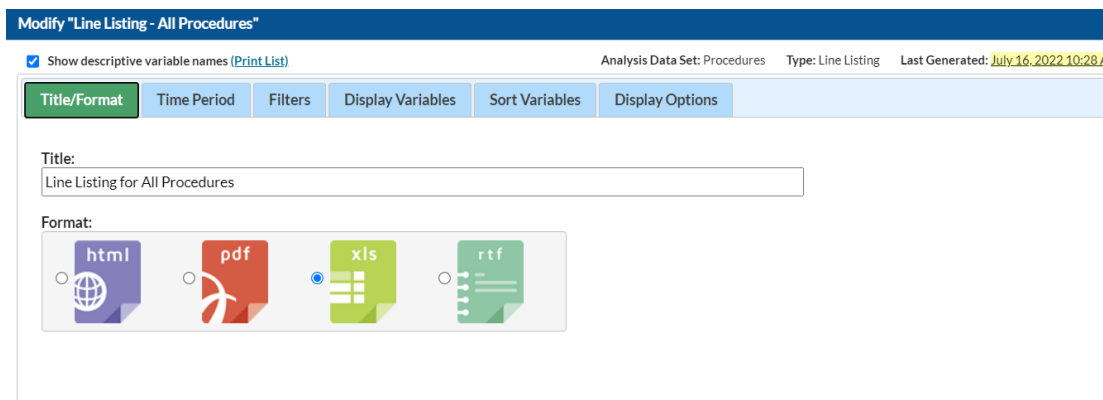| Procedure Type/No.	BMI			Wound class			Duration		
	BMI as reported to NHSN	BMI from validation medical record review	BMI **agree** (Discrepancy < 10 min.)	Wound class as reported to NHSN	Wound class from validation medical record review	Wound classes **agree**	Duration as reported to NHSN	Duration from validation medical record review	Duration **agree** (Discrepancy <1.0 BMI
1			☐			☐			☐
2			☐			☐			☐
3			☐			☐			☐
4			☐			☐			☐
5			☐			☐			☐
6			☐			☐			☐
7			☐			☐			☐
8			☐			☐			☐
9			☐			☐			☐
10			☐			☐			☐
Total	N:		D:			E:			F:

Updated 10/03/2022

Appendix C: Generating NHSN Procedure Line Lists:

1) After logging in to NHSN, be sure you have generated a data set since your last data entry session. Click on Analysis→ Reports→ Advanced→ Procedure level data→ Line Listing All procedures →**Modify Report**

Select output format "XLS" – this makes saving to your home drive easier to work with your data later if you wish.

2) Check "Show Description Variable Names"

3) Fill in date variable for first 2 quarters of 2022: ProcDateYH: Beginning 2022H1→Ending 2022H2

4) Go to tab "Filters" and select Add Rule and then select the three procedure codes from the dropdown box. Be sure "OR" is selected.

5) Select tab Display Variables and select variables PatID, dob, procCode, procID, procdate, procDurationHR, procedDurationMin, swClass, diabetes, wtEnglish, htfeet, htinches, wtMetric, htMetric, BMI_val (select English or Metric depending on how your hospital report these data)

6) Click **RUN** – Your data will appear similar to the following chart. You are now ready to compare denominator data entered into NHSN to what is in the patient's medical record.

Date of Birth	Gender	Procedure Date	Procedure Code	BMI_val	Diabetes Mellitus	Patient Height - ft	Patient Height - in	Patient Height - meters	Wound Class	Patient Weight - lb	Patient Weight - kg	Duration of~Procedure - hr	Duration of~Procedure - min
11/7/1969	F	1/3/2022	COLO	24.22145	N	5	7	1.7	CC	154.32	70	2	15
11/17/1992	M	1/3/2022	COLO	27.66983	N	6	1	1.85	CO	208.78	94.7	1	53
4/10/1982	F	1/31/2022	COLO	52.20241	Y	5	4	1.62	CO	302.03	137	1	55
2/6/1951	M	1/3/2022	COLO	18.20988	N	5	11	1.8	CO	130.07	59	1	25
9/20/1969	M	2/23/2022	COLO	22.77914	N	6	4	1.93	CC	187.06	84.85	2	20
7/8/1947	M	2/4/2022	COLO	30.4321	Y	5	11	1.8	CC	217.37	98.6	2	47
5/27/1973	F	2/17/2022	COLO	35.31692	Y	5	8	1.73	CC	233.03	105.7	6	42
12/25/1938	M	2/23/2022	COLO	33.91003	Y	5	7	1.7	CC	216.05	98	2	23
7/10/1987	M	2/10/2022	COLO	26.19236	N	5	9	1.74	CO	174.82	79.3	1	47
7/21/1946	F	2/19/2022	COLO	32.53906	N	5	3	1.6	CC	183.64	83.3	3	38
5/10/1952	M	2/15/2022	COLO	25.38427	N	5	7	1.69	CO	159.83	72.5	2	56
4/13/1957	M	2/8/2022	COLO	31.75352	N	5	5	1.66	D	192.9	87.5	2	45
4/5/1992	F	1/27/2022	CSEC	29.75779	N	5	7	1.7	CC	189.6	86	0	55
3/3/1997	F	1/20/2022	CSEC	34.36949	N	5	2	1.58	CC	189.15	85.8	1	14
7/19/1986	F	1/19/2022	CSEC	33.11754	N	5	4	1.63	CC	193.98	87.99	0	32
6/9/1997	F	1/10/2022	CSEC	34.17489	N	5	0	1.53	CC	176.37	80	0	39
5/21/1992	F	1/9/2022	CSEC	31.32511	N	5	2	1.58	CC	172.4	78.2	1	16
5/27/1994	F	1/31/2022	CSEC	29.58984	N	5	3	1.6	CC	167	75.75	1	2
4/1/1985	F	1/28/2022	CSEC	31.00781	N	5	3	1.6	CC	175	79.38	0	36
10/1/1989	F	1/10/2022	CSEC	32.46191	N	5	0	1.52	CC	165.34	75	0	52
7/4/1996	F	1/28/2022	CSEC	33.70294	N	5	4	1.62	CC	195	88.45	0	27
5/26/1985	F	1/21/2022	CSEC	33.32231	N	5	5	1.65	CC	200	90.72	0	37
6/12/1987	F	1/28/2022	CSEC	26.31344	N	5	2	1.57	CC	142.99	64.86	0	37
4/14/1994	F	1/6/2022	CSEC	37.77778	N	4	11	1.5	CC	187.39	85	0	58
12/6/1991	F	1/2/2022	CSEC	37.98714	N	5	5	1.65	CC	228	103.42	0	59
10/5/1999	F	1/4/2022	CSEC	27.58733	N	5	2	1.57	CC	149.91	68	0	39
11/11/1987	F	1/29/2022	CSEC	24.54527	N	5	1	1.55	CC	130.01	58.97	0	55
4/22/1997	F	1/23/2022	CSEC	24.51551	N	6	0	1.83	CC	181	82.1	0	51
8/14/1992	F	1/11/2022	CSEC	41.65289	N	5	5	1.65	CC	250	113.4	0	49