



## Overview of the Patient Safety Component

**SAFER • HEALTHIER • PEOPLE™**



## Target Audience

- This training is designed for those who will collect and analyze Patient Safety Component data or enroll a hospital into NHSN

This includes:

- NHSN Facility Administrator
- Patient Safety Primary Contact
- Infection Control Professional (ICP)
- Epidemiologist
- Microbiologist
- Pharmacist
- Data entry staff

This training is designed for those who will collect and analyze Patient Safety Component data or enroll a hospital into NHSN. This includes: NHSN facility administrators, Patient Safety Primary contact, infection control professionals or ICPs, epidemiologists, microbiologists, pharmacists and data entry staff.



# Objectives



1. Describe NHSN and its purposes
2. Define the authority and confidentiality protections for NHSN
3. Identify the requirements for participating in the Patient Safety Component
4. Describe the NHSN surveillance methodology
5. List the modules of the Patient Safety Component
6. Explain key terms used in the Patient Safety Component
7. Describe the Monthly Reporting Plan



## National Healthcare Safety Network (NHSN)



- NHSN is an internet-based surveillance system that integrates the surveillance systems previously managed separately in the Division of Healthcare Quality Promotion (DHQP) at CDC
  - National Nosocomial Infections Surveillance (NNIS) system
  - Dialysis Surveillance Network (DSN)
  - National Surveillance System for Healthcare Workers (NaSH)



## Purposes of NHSN



- Collect data from a sample of US healthcare facilities to permit valid estimation of the
  - magnitude of adverse events among patients and healthcare personnel
  - adherence to practices known to associated with prevention of healthcare-associated infections (HAI)
- Analyze and report collected data to permit recognition of trends



## Purposes of NHSN



- Provide facilities with risk-adjusted data that can be used for inter-facility comparisons and local quality improvement activities
- Assist facilities in developing surveillance and analysis methods that permit timely recognition of patient and healthcare personnel safety problems and prompt intervention with appropriate measures
- Conduct collaborative research studies with members



## Authority and Confidentiality for NHSN



- Public Health Service Act (42 USC 242b, 242k, and 242m(d))
- Confidentiality Protection
  - Sections 304, 306, and 308(d) of the PHS Act

"The information contained in this surveillance system that would permit identification of any individual or institution is collected with a guarantee that it will be held in strict confidence, will be used only for the purposes stated, and will not be disclosed or released without the consent of the individual, or the institution in accordance with Sections 304, 306, and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d))."



## Data Collection and Reporting Requirements for Patient Safety Component



1. Submit a Monthly Reporting Plan to inform CDC which, if any, of the patient safety modules will be used for that month
2. Adhere to the selected module's protocol(s) exactly as described in the *NHSN Manual: Patient Safety Component Protocol*

There are 8 requirements for data collection and reporting. The first 7 relate to successful completion of the patient safety modules selected for use. The requirements include:

- 1<sup>st</sup>, submit a monthly **reporting plan** to inform CDC which, if any, of the patient safety modules will be used for that month.
- 2<sup>nd</sup>, adhere to the selected module's protocol(s) exactly as described in the *NHSN Manual: Patient Safety Component Protocol*.



## Data Collection and Reporting Requirements for Patient Safety Component



*(continued)*

3. Use surveillance methodology as described in the Protocol (detailed in the next section)
4. Report events and appropriate summary or denominator data indicated on the Plan to CDC within 30 days of the end of the month

- Third, use surveillance methodology as described in the Protocol, **which will be** detailed in next section
- Fourth, report events and appropriate summary or denominator data indicated on the Plan to CDC within 30 days of the end of the month



## Data Collection and Reporting Requirements for Patient Safety Component



*(continued)*

5. Submit data for at least one module for a minimum of 6 months of the calendar year
6. Complete an annual survey for your facility
7. Pass quality control acceptance checks that assess the data for completeness and accuracy

- Fifth, submit data for at least one module for a minimum of 6 months of the calendar year
- Sixth, complete an annual survey for your facility, and
- Seventh, pass quality control acceptance checks that assess the data for completeness and accuracy.



## Data Collection and Reporting Requirements for Patient Safety Component



*(continued)*

8. Agree to report to state health authorities adverse event outbreaks identified in the facility by the surveillance system and about which you are contacted by CDC.

Failure to comply with these requirements will result in removal from the NHSN

The eighth requirement for data collection and reporting involves reporting to state health authorities any adverse event outbreaks identified in ones' facility by the surveillance system and about which they are contacted by CDC

Failure to comply with these requirements will result in removal from the NHSN



## Staffing Requirements for Participating in the PS Component

- There are no specific FTE requirements, but a trained Infection Control Professional (ICP) or Hospital Epidemiologist should oversee the HAI surveillance program
- Other personnel can be trained to
  - Screen for events (e.g., infections)
  - Collect denominator data
  - Collect infection prevention practices (process measure) data
  - Enter data
  - Analyze data





## NHSN Surveillance Methodology



- Active
- Patient-based
- Prospective
- Priority-directed
- Risk-adjusted rates
- Incidence rates

NHSN **surveillance** is the active, patient-based, prospective, priority-directed **collection of data** that results in risk-adjusted, incidence rates. The following slides will look at these characteristics in greater depth.



## NHSN Surveillance Methodology



### ACTIVE vs. PASSIVE

- **ACTIVE** Trained personnel use standard definitions and a variety of data sources to identify events
- **PASSIVE** Personnel, such as staff nurses, not trained to do surveillance report events

Active surveillance methodology requires personnel who have been trained to identify events using standard definitions and a variety of data sources.

In contrast, passive surveillance methodology allows staff not specifically trained to do surveillance, to identify and report events. An example of passive surveillance is a report from a staff nurse to the infection control department regarding a patient with pneumonia. Since no standard criteria to define pneumonia were used, it is possible that another person might interpret the patient's illness differently and not reported it as an infection.



## NHSN Surveillance Methodology



### PATIENT-BASED vs. LABORATORY-BASED

- **PATIENT-BASED** Monitoring patients for events, risk factors, and procedures and practices related to patient care
  - Visit patient care areas
  - Review patient charts
  - Discuss with caregivers
- **LABORATORY-BASED** Case-finding based solely on positive lab findings

Case finding using patient-based surveillance methodology is defined as monitoring patients for events, risk factors, and procedures and practices related to patient care. For identifying infectious events, this methodology requires visits to patient care areas, review of patient charts and discussions with caregivers. In contrast, laboratory-based case-finding is the identification of infectious events based solely on positive lab findings, without reviewing clinical findings or results of other diagnostic or therapeutic tests. Some events, such as pneumonia, will be grossly under-ascertained using only laboratory-based surveillance.



## NHSN Surveillance Methodology



### PROSPECTIVE vs. RETROSPECTIVE

- **PROSPECTIVE** Monitoring patients while still in the institution; includes post-discharge period for SSI
- **RETROSPECTIVE** Case-finding based solely on chart review after patient discharged

Prospective case finding is a patient-based methodology that includes monitoring patients while they are in the institution, either during the initial admission or upon readmission. Prospective case finding for SSI also includes monitoring patients in the post discharge period (called post-discharge surveillance). In contrast, retrospective case finding is based on chart review only after the patient is discharged, and is limited to the information contained in the chart. Without visits to the patient care area for direct observation and discussions with caregivers, retrospective case-findings is likely to under-ascertain certain events.



## NHSN Surveillance Methodology



### PRIORITY-DIRECTED vs. COMPREHENSIVE

- **PRIORITY-DIRECTED** Objectives for surveillance are defined and focused on specific events, processes, organisms, and/or patients/populations
  
- **COMPREHENSIVE** Continuous monitoring of all patients for all events and/or processes

NHSN surveillance methodology uses priority-directed surveillance, where objectives are defined and focused on specific events, processes, organisms, and/or patients/populations.

In contrast, comprehensive surveillance monitors all patients continuously for all processes, infections or other events at all body sites in all locations of a facility. Ongoing comprehensive surveillance for infectious events has proven to be too resource intensive for large facilities to maintain.



## NHSN Surveillance Methodology



### RISK-ADJUSTED vs. CRUDE RATES

- **RISK-ADJUSTED** Rates are controlled for variations in the distribution of major risk factor(s) associated with an event's occurrence
  - Comparison of rates is useful
- **CRUDE** Rates assume equal distribution of risk factors for all events
  - Comparison of rates not recommended

Risk adjusted rates are controlled for variations in the distribution of major risk factor(s) associated with an event's occurrence. For example, device-associated rates stratified by type of location are risk-adjusted rates, such as ventilator-associated pneumonia in a surgical ICU. Comparison of risk-adjusted rates initially between a facility and a national aggregate, such as NHSN, or within a location in a facility from one time period to another, is useful to measure progress with interventions.

In contrast, crude unadjusted rates, assume equal distribution of risk factors for all events. For example, using crude rates to describe risk of surgery for all hospitalized patients would assume **all** patients are at equal risk of having surgery. Comparison of crude rates is not recommended.



# NHSN Surveillance Methodology



## INCIDENCE RATES vs. PREVALENCE RATES

### ■ INCIDENCE (I)

New events in a population occurring during some defined time period

$$I = \frac{\text{new events}}{\text{population during time period}}$$

### ■ PREVALENCE (P)

All events in a population occurring at either a point in time ( $P_{\text{point}}$ ) or during some defined time period ( $P_{\text{period}}$ ).

$$(P_{\text{point}}) = \frac{\text{new and existing events}}{\text{population at a point in time}}$$

$$(P_{\text{period}}) = \frac{\text{new and existing events}}{\text{population during time period}}$$

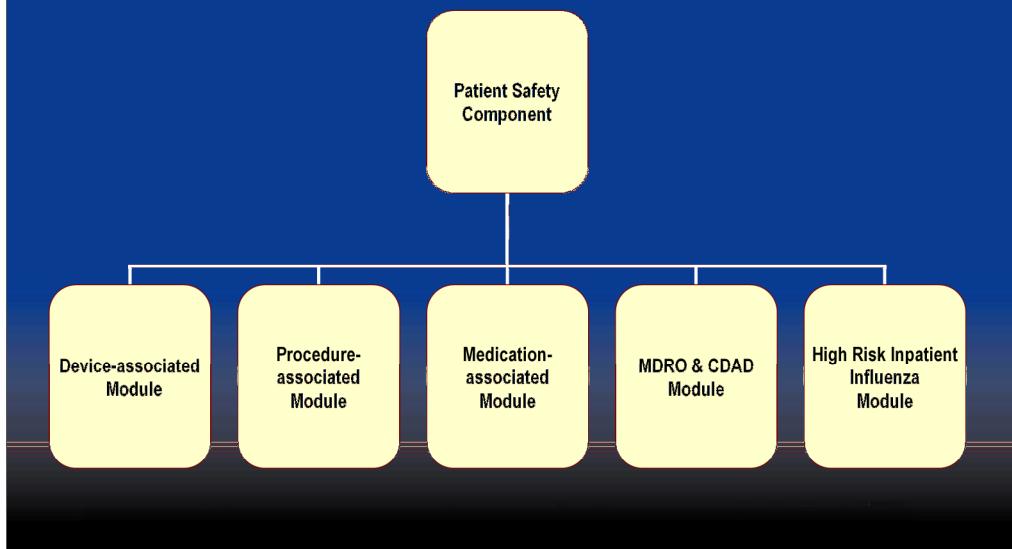
NHSN surveillance methodology yields **incidence** rates which are new events occurring in a population during a specific time period. A **prevalence** rate, on the other hand, is all events, both new and existing, in a population occurring at either a point in time or during a defined period of time.



NHSN is organized into four components: Patient Safety, Healthcare Personnel Safety, Biovigilance, and Research and Development. Patient Safety is used for monitoring patient healthcare-associated infection events and process measures for their prevention, Healthcare Personnel Safety is for monitoring healthcare personnel occupational-associated adverse events and process measures for their prevention. The Biovigilance component tracks adverse events and incidents associated with receipt of blood transfusions. The Research and Development component is for performance of special studies.

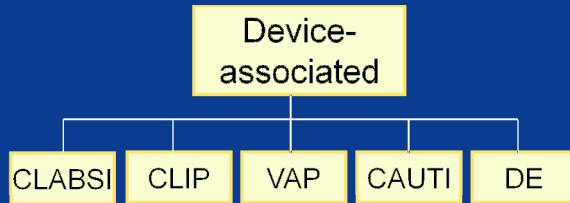


# Patient Safety Component Modules





# Patient Safety Component Modules



**CLABSI** Central line-associated bloodstream infection

**CLIP** Central line insertion practices\*

**VAP** Ventilator-associated pneumonia

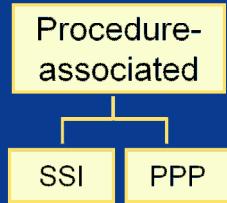
**CAUTI** Catheter-associated urinary tract infection

**DE** Dialysis event

\*Process measure: Adherence to hand hygiene, protective sterile barriers, appropriate antiseptic skin prep, etc.



## Patient Safety Component Modules



**SSI**      **Surgical site infection**

**PPP**      **Post-procedure pneumonia**



## Patient Safety Component MDRO & CDAD Module



- Two options
  - Multi-drug resistant organism (MDRO)
  - *C. difficile*-associated disease (CDAD)
- Process measures
  - adherence to active surveillance testing (AST)
  - hand hygiene, gown and glove use
- Provides direct and proxy outcome measures
  - E.g. - MDRO & CDAD healthcare-associated infection incidence rates
  - E.g.- Prevalence and incidence rates based on AST



# Patient Safety Component Modules



High Risk Inpatient Influenza Vaccination (HRIIV)\*



**Method A**      Summary Data

**Method B**      Patient-level Data

\*Process measure: proportion of high risk patients getting vaccinated prior to discharge



## Patient Safety Component Key Terms



- Healthcare-associated Infection (HAI)
- Location
  - CDC Location
  - 80% Rule
- Attribution of HAI
  - Facility-level
  - Location-level for device-associated HAI
  - Procedure-level for procedure-associated HAI

NHSN Key Terms can be found in the *NHSN Manual: Patient Safety Component Protocol*

Key terms to be reviewed include:

- Healthcare-Associated infection or HAI
- NHSN location, including the 80% rule and we will define attribution of HAI at three levels, facility, location and procedure.

NHSN key terms can also be found in the ***NHSN Patient Safety Component Protocol*** document.



**Healthcare-associated Infection  
(HAI)**

- A localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that
  - Occurs in a patient in a healthcare setting and
  - Was not present or incubating at the time of admission, unless the infection was related to a previous admission
- When the setting is a hospital, meets the criteria for a specific infection (body) site as defined by CDC
- When the setting is a hospital, may also be called a nosocomial infection

The first key term, -- **healthcare-associated Infection or HAI** is a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s).

An HAI is **an infection that occurs in a patient in a healthcare setting** which was not present or incubating at the time of admission, unless the infection was related to a previous admission

When the setting is a hospital, the HAI **must** meet the criteria for a specific infection at an anatomic body site as defined by CDC.

In a hospital, an HAI may also be called a nosocomial infection.



## Location



- In the Patient Safety Component, location is the area where a patient was assigned while receiving care in the healthcare facility
  - Inpatient location: Area where patients are housed overnight
- For DA Module surveillance of events, only inpatient locations where denominator data can be collected are eligible for monitoring (e.g., ICU, ward)
  - Examples of locations not eligible: operating room, interventional radiology, emergency department, etc
- For DA Module process measure surveillance, location is the area where the patient was assigned when the practice under surveillance was performed

In the Patient Safety Component, the **location** is the area where a patient was assigned while receiving care in the healthcare facility. For DA Module event surveillance, only inpatient locations (i.e., where patients are housed overnight) where denominator data can be collected are eligible for monitoring. Examples include ICU, SCA, inpatient ward; examples not eligible include operating room, interventional radiology, emergency department. For DA Module process measure surveillance, location is the area where the patient was assigned when the practice under surveillance was performed. For example, central line insertion practices (CLIP) monitoring could be done in the emergency department or in an ICU.



## Location



- Location is used to stratify device-associated infection rates
- A location may treat patients for more than one clinical service

Location is also used to stratify device-associated infection rates. Remember, a specific location may treat patients from more than one clinical service.



## CDC Locations



- A list of standard descriptions for patient care and other areas of healthcare facilities
  - List can be found in the *NHSN Manual: Patient Safety Component Protocol*
- Each location under surveillance must be “mapped” to one standard CDC Location description
- The correct mapping to a CDC Location is determined by the type of patients receiving care
  - 80% Rule: 80% of the patients must be of a consistent type to classify the location as that specific type

CDC Locations are a list of standard descriptions for patient care and other areas of healthcare facilities. The list of CDC Locations can be found in the *NHSN Patient Safety Component Protocol* document. Each location under surveillance must be “mapped” to one standard CDC Location description. The correct mapping to a CDC location is determined by the type of patients receiving care. The 80% rule means 80% of the patients must be of a consistent type to classify the location as that specific type.



## CDC Location



### 80% Rule

#### Example

If 80% of patients on a ward are pediatric patients with orthopedic problems, the location is designated as an Inpatient Pediatric Orthopedic Ward.

#### EXCEPTION

For patient care areas where the mix of medical and surgical patients is approximately equal, use the combined medical/surgical location designation.

- For instructions on setting up locations in NHSN, refer to the training “NHSN Enrollment and Facility Start-up”.

For **example**, if 80% of patients on a ward are pediatric patients with orthopedic problems, the location is designated as an Inpatient Pediatric Orthopedic Ward.

An **exception** to this rule would be patient care areas where the mix of medical and surgical patients is approximately equal. In this case you would use the combined medical/surgical location as a designation.

For instructions on setting up locations in NHSN, see the training, “NHSN Enrollment and Facility Start-up”.



## Attribution of HAI



- Once an HAI is identified, the next step is to determine the level of attribution
- The three levels of attribution are:
  - Facility-Level
  - Location-Level
  - Procedure-Level

Once an HAI is identified, the next step is to determine the level of attribution. The three levels of attribution are: facility-level, location-level and procedure-level.



## Attribution of HAI: Facility-Level



- When a patient is admitted to a facility with an HAI, determine whether or not to attribute the HAI to this facility.

### Examples

Patient is discharged from Hospital A and returns 15 hours later to Hospital A with an HAI. This is an HAI for Hospital A.

Patient is admitted to Hospital B with an infection which was determined to be attributed to Hospital A. This is an HAI for Hospital A, not Hospital B.

When a patient is admitted to a facility with an HAI, determine whether or not to attribute the HAI to this facility.

For example, a patient is discharged from Hospital A and returns 15 hours later to Hospital A with an HAI. This is an HAI for Hospital A.

In another example, a patient is admitted to Hospital B with an infection which was determined to be attributed to Hospital A. This is an HAI for Hospital A, not Hospital B.



## Attribution of Device-associated HAI: Location-Level

- A device-associated HAI is attributed to the inpatient location where the patient was assigned on the date the HAI was identified

### Example

Patient has a central line inserted in the Emergency Department and then is transferred to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for BSI. This is reported to NHSN as a CLABSI for the MICU.

A device-associated HAI is attributed to the inpatient location where the patient was assigned on the date the HAI was identified. For example, a patient has a central line inserted in the Emergency Department and then is transferred to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for BSI. This is reported to NHSN as a CLABSI for the MICU.

For example, a patient with a central line is discharged from the surgical ICU to an orthopedic ward and develops a blood stream infection within 24 hours. This CLA-BSI would be attributed to the surgical ICU, not the orthopedic ward.



## Attribution of Device-associated HAI: Location-Level

- **EXCEPTION:** Transfer Rule

- If a device-associated HAI develops within 48 hours of transfer from one inpatient location to another in the same facility, the HAI is attributed to the transferring location.

**Example**

Patient with a central line is transferred from the surgical ICU to an orthopedic ward and develops a BSI within 24 hours. This CLABSI is attributed to the surgical ICU.

If the device-associated HAI develops in a patient within 48 hours of transfer from one inpatient care area to another in the same facility, the HAI is attributed to the transferring location. This is called the Transfer Rule.

For example, a patient with a central line is transferred from the surgical ICU to an orthopedic ward and develops a bloodstream infection within 24 hours. This CLABSI would be attributed to the surgical ICU, not the orthopedic ward.



## Attribution of Procedure-associated HAI



Procedure-associated HAIs  
are attributed to the procedure  
NOT the location

**Remember, procedure-associated HAIs are attributed  
to the procedure NOT the location.**



## Monthly Reporting Plan



- The Monthly Reporting Plan informs CDC which modules a facility is following during a given month
- A facility must enter a Plan for every month of the year, even those in which no modules are followed
- A facility may enter data only for months in which Plans are on file

The Monthly Reporting Plan informs CDC which modules a facility is following during a given month.

A facility must enter a Plan for every month of the year, even those in which no modules are followed.

A facility may enter data only for months in which Plans are on file.



## Monthly Reporting Plan Options



Choose either:

- Enter a Plan that conforms to one or more of the modules of the Patient Safety Component
- or
- Enter a “No Patient Safety Modules Followed” option

There are two options for entering a Plan.

You can enter a Plan that conforms to one or more of the modules of the Patient Safety Component or you may use the “No Patient Safety Modules Followed” option.

 Sample Monthly Reporting Plan 

NHSN Home      Logged into Medical Center East (ID 10000) as TCH.  
 Reporting Plan      Facility Medical Center East (ID 10000) is following PS component.

**Edit Monthly Reporting Plan**

Mandatory fields marked \*

Facility ID\*: Medical Center East (ID 10000)  
 Month\*: January  
 Year\*: 2007  
 No NHSN Patient Safety Modules Followed this Month

[Print PDF](#)

---

**Device-Associated Module**

Locations	CLA	BSI	DI	VAP	CAUTI	CLIP
SICU - SURGICAL ICU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NCC3 - NEONATAL CRITICAL CARE LEVEL III	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MSICU - MEDSURG ICU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add Row    Clear All Rows    Copy from Previous Month

---

**Procedure- Associated Module**

Procedures	SSI	Post-procedure	PNEU
CARD - Cardiac surgery	IN - Inpatient	<input type="checkbox"/>	<input type="checkbox"/>
CBGB/CBGC - Coronary artery bypass graft	IN - Inpatient	<input type="checkbox"/>	<input type="checkbox"/>
HPRO - Hip prosthesis	IN - Inpatient	<input type="checkbox"/>	<input type="checkbox"/>
LAM - Laminectomy	IN - Inpatient	<input type="checkbox"/>	<input type="checkbox"/>

Add Row    Clear All Rows    Copy from Previous Month

Here is a view of what the actual screen would look like in NHSN, showing the first option. Using pull down menus you can clarify your plan, choosing the locations, modules, procedures and events that you will follow that month.



# MDRO & CDAD Monthly Reporting Plan



## Multi-Drug Resistant Organism Module HELP

Locations	Setting	Specific Organism Type			
3S - 3 SOUTH	IN - Inpatient	MRSA - MRSA			
Process and Outcome Measures					
Infection Surveillance	AST-Timing	AST-Eligible	Incidence Prevalence	Lab ID Event	HH GG
<input checked="" type="checkbox"/>					
BURN - BURN UNIT			IN - Inpatient	MRSA - MRSA	
Infection Surveillance	AST-Timing	AST-Eligible	Incidence Prevalence	Lab ID Event	HH GG
<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add RowsClear All RowsCopy from Previous Month



**Example Plan that conforms  
to the “No Patient Safety Modules  
Followed” option**

Mandatory fields marked with \*

Facility ID\*: DHQP Memorial Hospital (ID 10000)

Month\*: April

Year\*: 2008

No NHSN Patient Safety Modules Followed this Month

...or, as shown in this view of an actual screen, you can choose to select *No Patient Safety Module followed* this month.



## References



- For more information about these topics, refer to the NHSN website:  
<http://www.cdc.gov/nhsn>
  - *NHSN Manual: Patient Safety Component Protocol*
    - Tables of instructions for completing all forms
    - Key terms
    - CDC location codes
    - Operative procedure codes
  - Purposes, data collection requirements and assurance of confidentiality
  - NHSN data collection forms

