Spring 2023 NHSN Vendor Meeting

April 24, 2023

Welcome

- Introduction – Andrea Benin
- General NHSN Release Updates
- COVID-19 Module Updates
- Release 11.3 Updates
- Future Releases
- FHIR Measure Implementation
- LTC: EHR Implementation for Nursing Homes
- Gender Variable Update
- AUR Module Updates
- NHSN Pre-Production Test Site (NPPT)
- Miscellaneous Vendor Services
- Q&A

Introduction

Andrea Benin

Future Initiatives

- Medication Safety Component
  - Glycemic Control, Hypoglycemia
  - Glycemic Control, Hyperglycemia
- Revised *C. difficile* Infection (Hospital-associated, antibiotic-treated CDI)
- Hospital Onset Bacteremia
- Respiratory Pathogens Surveillance
- Venous Thromboembolism (VTE1, VTE2, other candidate measures)
- Sepsis
- Non-Ventilator Associated Pneumonia

General NHSN Release Updates

Pamela Crayon

NHSN Release Schedule Overview

- Continuing one major release a year
  - Changes included:
    - Protocol changes
    - Transition to new CDA versions due to protocol changes
    - Effective January 1st of each year
- Minor releases
  - Occurring on an eight-week basis as needed
  - May include:
    - New Component/Module
    - Minor change requests
    - Defect resolutions
    - Infrastructure maintenance and support
  - Users notified via message alert when logging into NHSN

Upcoming NHSN Releases

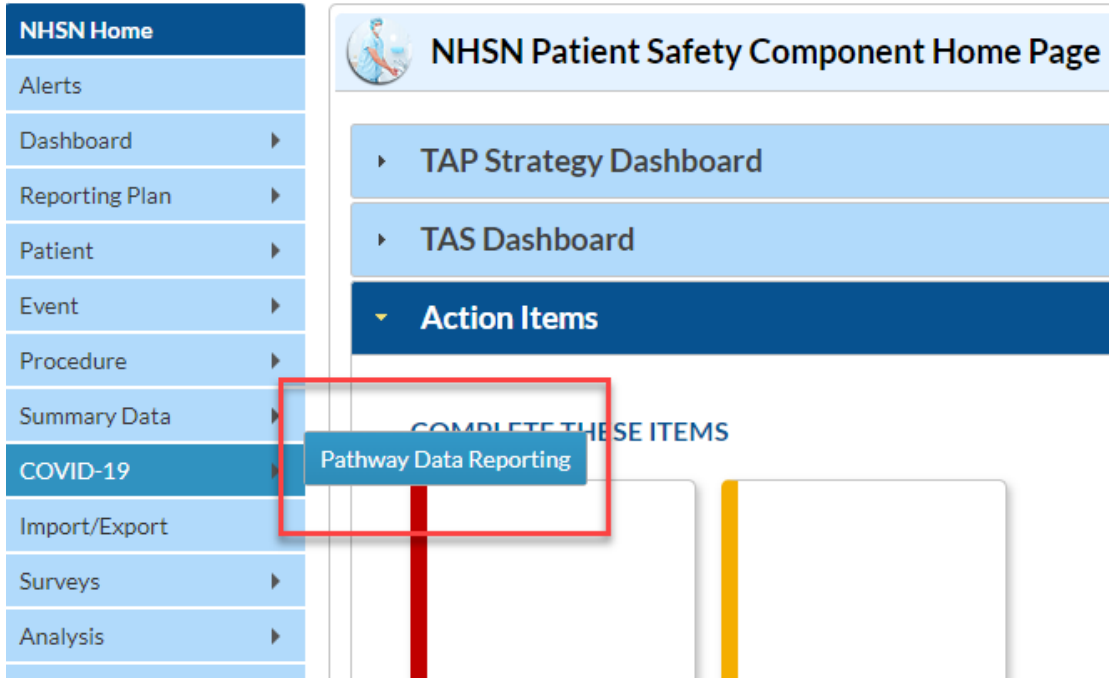
- Release 11.4
  - Scheduled for June 10, 2023
  - Defect fixes will be effective post deployment
  - CRs will be effective June 12, 2023
- Release 11.5
  - Scheduled for August 5, 2023
  - Defect fixes will be effective post deployment
  - CRs will be effective August 7, 2023

PS COVID-19 Module Updates

Sylvia Shuler

Patient Safety COVID-19 Hospital Data to NHSN

- Reporting of COVID-19 Hospital Data will take place in the Patient Safety Component of NHSN using Webform interface and CSV Upload
- There will be no impact or changes to reporting for the LTCF, Dialysis, and Healthcare Personnel Vaccination COVID-19 modules in NHSN
- Reporting processes for COVID-19 hospital data will remain the same



PS COVID-19 Module

- CSV files submitted via Direct and API Submission are also available for Patient Safety uploads
- Instructions on how to sign up and use these methods are available on the NHSN website:

  Transition Webpage https://www.cdc.gov/nhsn/covid19/transition.html
- COVID-19 Hospital Data Reporting Guidance: https://www.hhs.gov/sites/default/files/covid-19-faqs-hospitals-hospital-laboratory-acute-care-facility-data-reporting.pdf
- Questions can be sent to: NHSN@CDC.GOV
  - Subject line: "**COVID-19 Hospital**"

Release 11.3 Updates

Hamna Baig

Change Requests Implemented in Release 11.3

- Biovigilance: Adding Pathogen Reduced Cryoprecipitated Fibrinogen Complex to Monthly Denominators in the Hemovigilance Module
  - Added for manual entry in UI only; ability to send in CDA to follow

CDA HAI Vocabulary

Pamela Crayon

CDA HAI Vocabulary

- Biovigilance Codes added for Pathogen Reduced Cryoprecipitated Fibrinogen are as follows:
  - 1346-6: Number of units transfused: Cryoprecipitate: Pathogen Reduced Cryoprecipitated Fibrinogen Complex
  - 1347-4: Number of discards: Cryoprecipitate: Pathogen Reduced Cryoprecipitated Fibrinogen Complex

- Reminder: Value sets specified in CDA Implementation Guides that have been distributed in the spreadsheet hai_voc.xlsx are now available in VSAC (Value Set Authority Center) https://vsac.nlm.nih.gov/

Neonatal (NEO) Component – Release 11.4

Sylvia Shuler

NEO Change Requests Planned for Release 11.4 – June 2023

- Neonatal: Manual Import for LOS/MEN CDA files
  - Direct Automation for LOS/MEN CDA Imports was implemented in September, 2021

Future Release 12.0

Pamela Crayon

Future Release 12.0 – December 2023

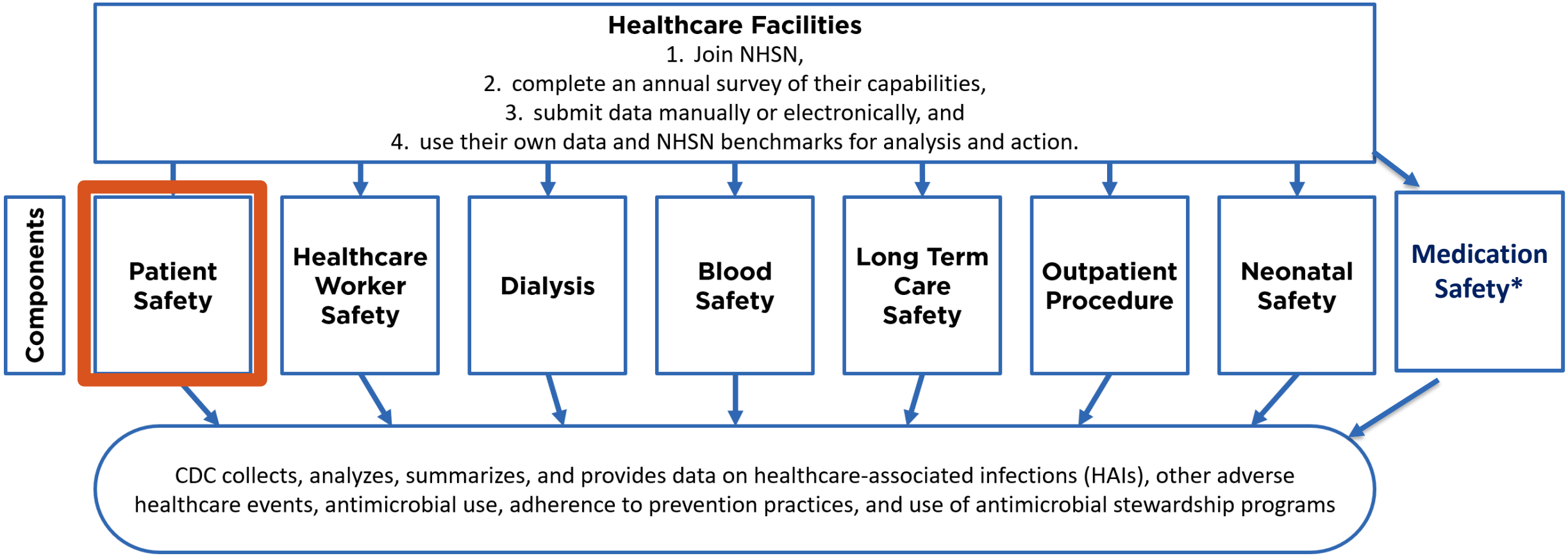
- Implementing new R4-D2 IG – Patient Safety: MDRO Summary
  - This version includes new observation sections to provide responses to IPF/IRF questions required for CMS reporting
    - Whether the facility contains a CMS-certified Inpatient Psychiatric (IPF) unit
    - Whether the facility contains a CMS-certified Inpatient Rehabilitation (IRF) unit
- Effective January 1, 2024

FHIR Measure Implementation

Patient Safety Component

Dominique Godfrey, Denise Leaptrot, and Jennifer Watkins

NHSN: Expansion of Patient Safety Component



* "beta version" released to selected U.S. hospitals

NHSN HT-CDI and HOB: Eligible Facilities & Data Submission

- **Eligible facilities:**
  - All **inpatient facilities** enrolled in the NHSN Patient Safety Component
  - Long-term facilities, outpatient dialysis facilities not yet eligible

- **Data submission:**
  - Requires **HL7 FHIR® R4 API** (FHIR vR4.0.1 or higher) **for participation**
  - Manual and CDA data transmission will not be available for this module

Facilities must work with their EHR vendors to enable data transmission via the NHSN FHIR endpoint

HL7: Heath Leve Seven; FHIR: Fast Healthcare Interoperability Resources

Healthcare facility-onset, antibiotic Treated *C. difficile* infection (HT-CDI)

- *Purpose*: Improve upon existing CDI measure by including evidence of *C. difficile* *positive test AND antibiotic treatment.*

- *Definitions*:
  - HT-CDI: Positive *C. difficile* test on day ≥4 AND ≥5 days of *C. difficile* antibiotic treatment
  - *Complimentary metrics: Test utilization, Community-onset CDI*

- *Key Data Elements*: Microbiology, Medications

Hospital-Onset Bacteremia & Fungemia (HOB)

- *Purpose*: Surveillance for broader reduction of bloodstream infections, regardless of organism (eg. MRSA) or association with device (CLABSI)

- *Definitions*:
  - HOB: Blood culture collected on day 4 or later with pathogenic bacteria or fungi
  - *Complimentary metrics: Blood culture utilization, Contamination, Community-onset bacteremia & fungemia, Matching Commensal Hospital-Onset Bacteremia*

- *Key Data Elements*: Microbiology

NHSN HT-CDI and HOB: Queried FHIR Resources & Data Elements

- Data will be collected for ED, Observation, and inpatients present at the facility during the reporting period
- The facility's FHIR endpoint can expose only selected, pre-specified FHIR resources that are invoked upon permission from the facility's server
- Data access can be controlled on a FHIR resource-by-resource basis

FHIR Resource	Data Elements
Condition (US Core)	All
Coverage (US Core)	All
Encounter (US Core)	All
Diagnostic Report Lab (US Core)	All
Implantable Device (US Core)	All
Laboratory Result Observation (US Core)	All
Location (US Core)	All
MedicationAdministration	All
MedicationRequest (US Core)	All
Medication (US Core)	All
Observation	Selected
Procedure (US Core)	All
Patient (US Core)	Selected
Specimen (US Core)	All

NHSN HOB and HT-CDI: April Release (Anticipated Functionality)*

- NHSN HOB and HT-CDI **protocols** available for CoLab participants
- Facility* activation of NHSN **HOB and HT-CDI Modules**
- Facility* completion of the NHSN **Annual Survey**
- Facility* completion of the NHSN HOB and HT-CDI **Annual Reporting Plans**
- Enabled NHSN **user and group** rights
- NHSN FHIR endpoint integration with facility FHIR v4.0.1 (or higher) API to pull selected FHIR resources necessary for calculating the HOB and HT-CDI module metrics

*Selected U.S. hospitals

NHSN HOB and HT-CDI: Projected Timeline

- Q2 2023:
  - Beta version of NHSN HOB and HT-CDI pre-Production modules launch for selected early adopter/pilot sites
  - Review and revise as per Beta testing results
- Q4 2023 to Q1 2024 (anticipated):
  - NHSN HOB and HT-CDI Modules open to all sites with FHIR R4 API

Respiratory Pathogens Surveillance (RPS)

- *Purpose*: To meet the national needs for more comprehensive and timely surveillance of hospitalizations due to respiratory pathogens.
  - COVID-19, Influenza, Respiratory Syncytial Virus (RSV)
- *Population*: admitted patients of all ages
- *Case Definitions (overview)*:
  - Laboratory Confirmed – positive test for target virus
  - Therapeutic Confirmed – active order for target medications
- *Key Data Elements*: Microbiology, Medications, Transmission Based Precautions

RPS Eligible Facilities & Data Submission

- Eligible facilities:
  - All inpatient acute care facilities enrolled in the NHSN Patient Safety Component
- Data Submission **Daily**:
  - **Electronic submission** via comma separated values (CSV) files
    - Facilities must work with their IT departments for electronic capture of data elements from their EHR
  - HL7 FHIR® R4 API (FHIR vR4.0.1 or higher)
    - Facilities must work with their EHR vendors to enable data transmission via the NHSN FHIR endpoint

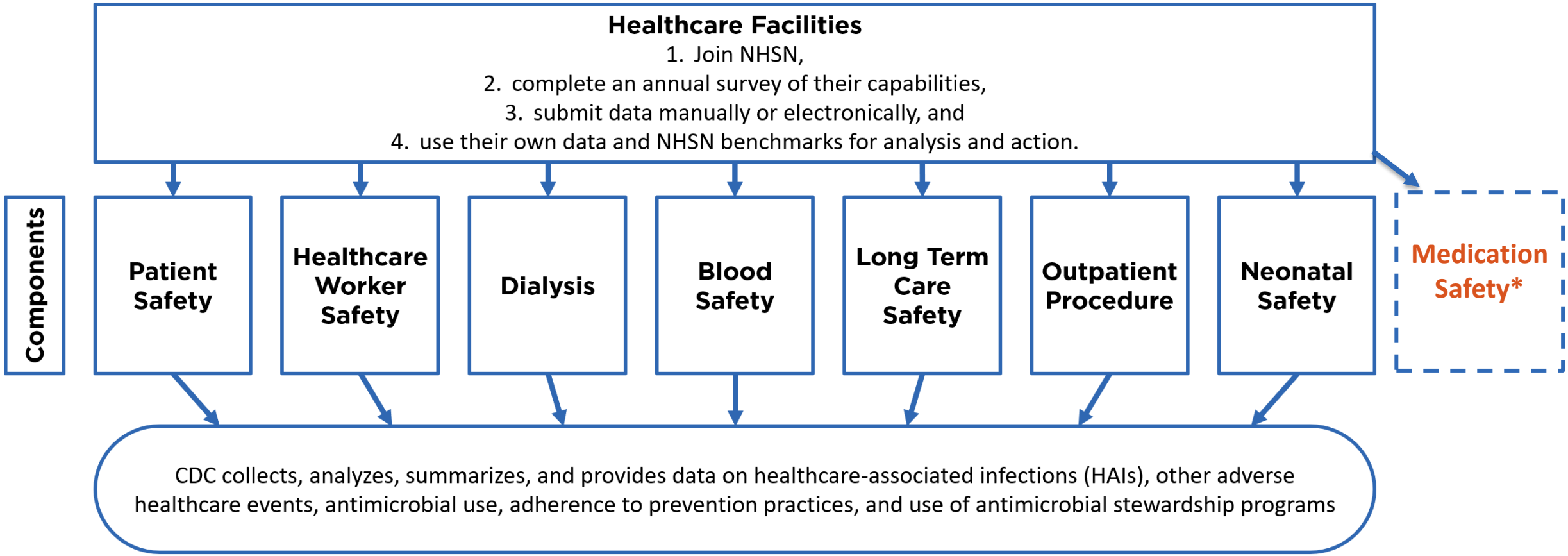
RPS Projected Timeline

- Q3 – Q4 2023:
  - CSV Beta version pre-production module launched for pilot testing
  - Review and revise as per Beta testing results
- Q3 – Q4 2023:
  - FHIR Beta version pre-production module launched for pilot testing
  - Review and revise as per Beta testing results

Medication Safety Component

Nadine Shehab

NHSN: Expansion into Medication-related Harm



*December release of “beta version” to selected U.S. hospitals

NHSN Glycemic Control, Hypoglycemia: Goals & Objectives

- **Goal:** To establish an EHR-neutral standard for submitting inpatient medication-related hypoglycemia data electronically to CDC's NHSN

- **Objectives:**
  - Support U.S. hospitals in measuring medication-related hypoglycemia to improve glycemic management
  - Facilitate benchmarking of medication-related hypoglycemia rates for U.S. hospitals

NHSN Glycemic Control, Hypoglycemia: Eligible Facilities & Data Submission

- **Eligible facilities:**
  - All **inpatient facilities** enrolled in the NHSN Medication Safety Component
  - Long-term facilities, outpatient dialysis facilities not yet eligible

- **Data submission:**
  - Requires **HL7 FHIR® R4 API** (FHIR vR4.0.1 or higher) **for participation**
  - Manual and CDA data transmission will not be available for this module
  - **Facilities must work with their EHR vendors to enable data transmission** via the NHSN FHIR endpoint

HL7: Heath Leve Seven; FHIR: Fast Healthcare Interoperability Resources

NHSN Glycemic Control, Hypoglycemia: Queried FHIR Resources & Data Elements (Planned)

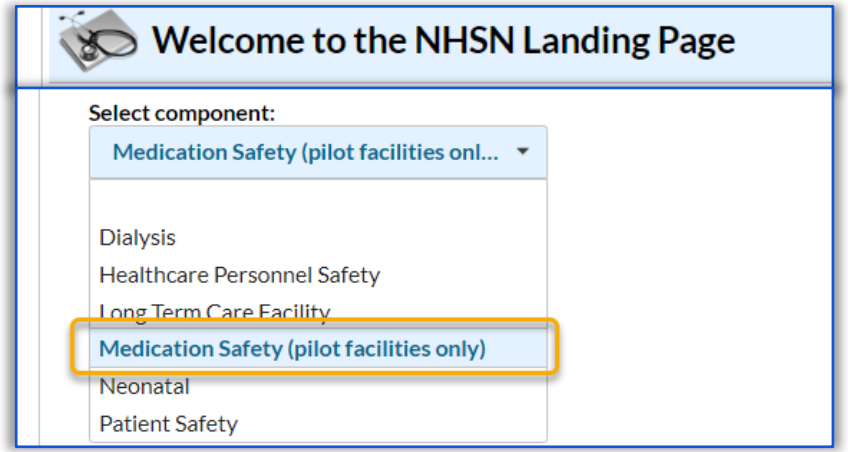
- Data will be collected for inpatients* receiving antidiabetic medications
- The facility's FHIR endpoint can expose only selected, pre-specified FHIR resources that are invoked upon permission from the facility's server
- Data access can be controlled on a FHIR resource-by-resource basis

FHIR Resource	Data Elements
Condition (US Core)	All
Coverage (US Core)	All
Encounter (US Core)	All
Location (US Core)	All
MedicationAdministration	All
MedicationRequest (US Core)	All
Observation (US Core)	All
Patient (US Core)	Selected
Specimen (US Core)	All

*Includes emergency department or in observation status stays that end within one hour of the inpatient admission.

NHSN Glycemic Control, Hypoglycemia: December Release (Anticipated Functionality)*

- NHSN Glycemic Control, Hypoglycemia **protocol** published
- Facility* activation of NHSN **Medication Safety Component**
- Facility* completion of the NHSN Glycemic Control **Annual Survey**
- Facility* completion of the NHSN Glycemic Control, Hypoglycemia **Monthly Reporting Plan**
- NHSN FHIR endpoint integration with facility FHIR v4.0.1 (or higher) API to pull selected FHIR resources necessary for calculating the NHSN Glycemic Control, Hypoglycemia module metrics



*Selected U.S. hospitals

NHSN Glycemic Control, Hypoglycemia Module: Surveillance Metrics

Measure	Numerator	Denominator
Primary Metric: Aligned with Centers fore Medicare & Medicaid Services (CMS) Reporting Requirements		
Metric 1, **Hospital Harm, Severe Hypoglycemia (NQF 3503e)**	No. of (adult) **inpatient encounters** with **BG <40 mg/dL** preceded by ADD (24 hours prior)*	No. of (adult) **inpatient encounters** with ≥1 ADD administered**
Complementary Metrics: For Quality Improvement Dashboards		
Metric 2, **Severe Hypoglycemia Days**	No. of **inpatient days** with **BG <40 mg/dL** preceded by ADD (24 hours prior)	No. of **inpatient days** with ≥1 ADD administered
Metric 3, **Percent Hypoglycemia Days**	**Percent of ADD days** with BG <40 mg/dL, 40-53 mg/dL, and 54-70 mg/dL	
Metric 4, **Recurrent Hypoglycemia**	**Percent of patients on ADDs with recurrent hypoglycemic day**. A "recurrent hypoglycemic day" is an inpatient day with a documented hypoglycemia event that is preceded by another inpatient day within a 24-hour period where a hypoglycemia event is also documented; this will be reported at <40 mg/dL and 54-70 mg/dL	
Metric 5, **Severe Hypoglycemia Resolution**	**Median time between BG <40 mg/dL and first BG ≥70 mg/dL** thereafter (hypoglycemia resolution) per ADD days	

*And no subsequent repeat test for BG with a result >80 mg/dL within five minutes of the start of the initial low BG test.
**Includes instances of administration of ADDs in the emergency department or in observation status that end within one hour of the inpatient admission.

Projected Phases of NHSN Glycemic Control Module Development

Phase 1

Facility report:

- **Primary hypo**glycemia metric (metric 1)
  - Selected stratification variables (e.g., age, sex, location)
  - Line-listing by "patient" and "event"
- **Complementary hypo**glycemia metrics (2, 3, 4, 5)

Phase 2

Additions:

- Inter-facility benchmarking
  - Selected stratification variables (facility type, DM/ESRD/ESLD population)

Phase 3

Additions:

- **Primary hyper**glycemia metric
- **Quality Improvement hyper**glycemia metrics
  - Selected stratification variables (e.g., age, sex, location)
  - Line-listing by "patient" and "event"
- Additional stratification variables for inter-facility benchmarking

EHR CDA Implementation for Nursing Homes

Jeneita Bell

NHSN Pilot Test EHR Implementation Project

- Healthcare associated infections (HAIs) are a substantial health burden in nursing homes (NHs)
- By 2018, 2,300 NHs were voluntarily reporting, but challenges & barriers make reporting difficult for NH staff which has become greatly exacerbated during the COVID-19 pandemic
- Efficiency improvements to the NH HAI surveillance system are needed for reliable reporting to NHSN & decreasing nursing home reporting burden
- Created an implementation guide in partnership with Lantana Consulting Group to develop electronic HAI reporting standards based on Clinical Document Architecture (CDA) and Fast Healthcare Interoperability Resources (FHIR)

Project Purpose & Objectives

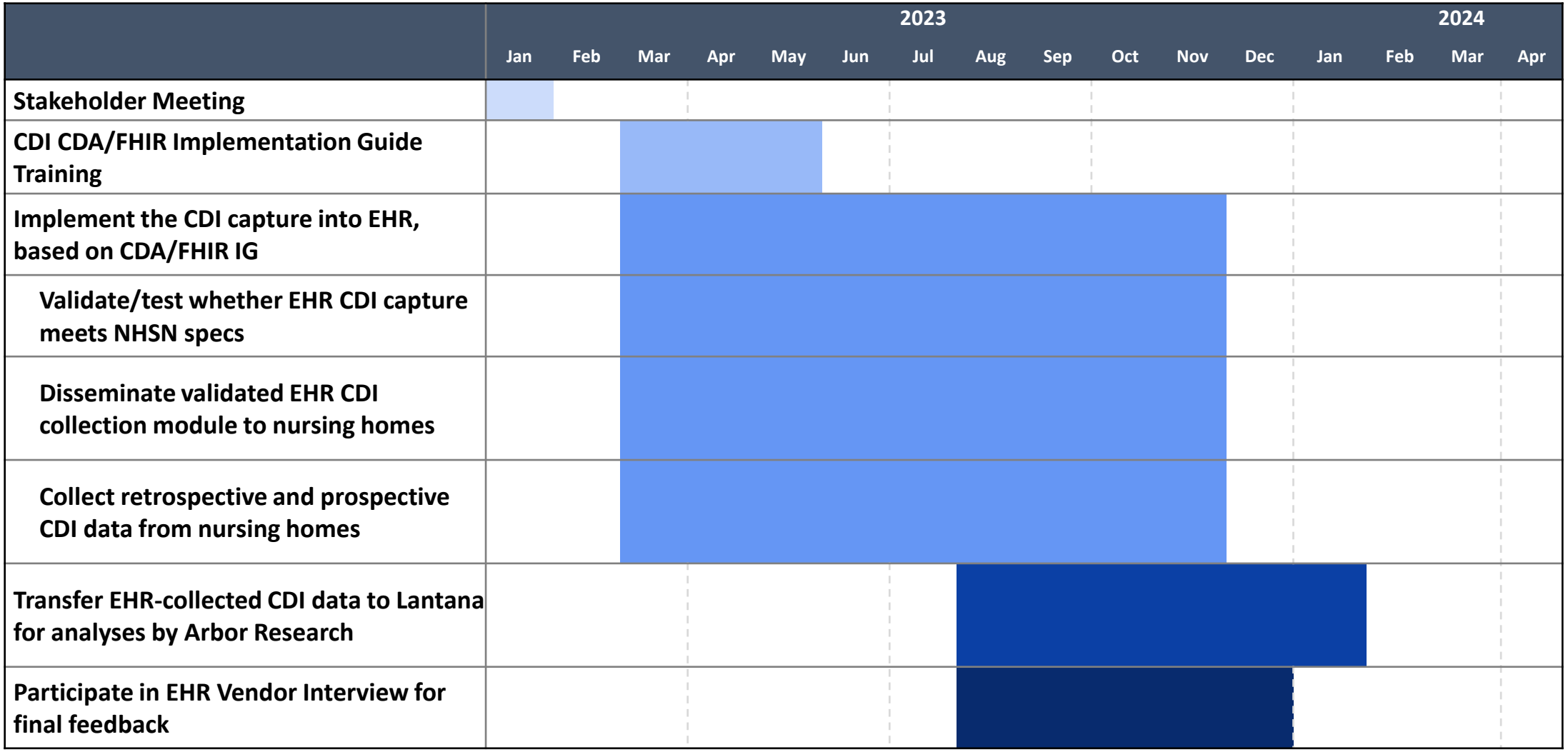
Ensure that CDA implementation guidance enables EHR systems to abstract data in accordance with NHSN protocols on behalf of nursing homes to **reduce nursing home data collection burden**

- Core Objectives:
  - Obtain participation of EHR vendors that service nursing homes
  - Assess the feasibility of EHR vendors to implement the CDA implementation guide to capture laboratory-identified events
  - Validate that EHR collection of CDI data meet NHSN specifications
  - Compare EHR & manually reported CDI data to verify concordance and accuracy of collected data

EHR Vendor Study Participation and Feedback

- EHR vendor experiences with the CDA/FHIR implementation guide
- Technical challenges faced while implementing or validating the CDA or FHIR implementation guide for CDIs
- Challenges in training or getting nursing homes to use functionality for EHR-based collection of CDI events
- Inform proposed changes to the NHSN protocol or revisions that would improve CDA/FHIR implementation or transfer of data to NHSN in the future

Timeline


2023
2024
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Stakeholder Meeting
CDI CDA/FHIR Implementation Guide Training
Implement the CDI capture into EHR, based on CDA/FHIR IG
Validate/test whether EHR CDI capture meets NHSN specs
Disseminate validated EHR CDI collection module to nursing homes
Collect retrospective and prospective CDI data from nursing homes
Transfer EHR-collected CDI data to Lantana for analyses by Arbor Research
Participate in EHR Vendor Interview for final feedback

LTC Change Requests Planned for Releases 11.4 & 11.5

- **Release 11.4 (June 2023)**
  - LTC: Denominator for LTCF LabID CDA Implementation (Manual Import)
  - LTC: Direct Automation for LTCF LabID Denominators CDA Imports
  - Refer to the R1-D1.1 Implementation Guide for LTCF LabID Summary CDA creation
  - Documentation will be posted on the Toolkits Webpage
- **Release 11.5 (August 2023)**
  - LTC: Direct automation for LTCF LabID Events CDA Imports
    - LTCF LabID Events CDA for Manual Import was implemented in December, 2022

Sex at Birth and Gender Identity Variable Update

Jennifer Watkins

New variable fields

- Sex at Birth – Birth Sex is synonym in the CDA IG
- Gender Identity

Value sets in use in the CDA IG (the templates used are C-CDA templates).

Timeline for implementation within NHSN

Jan 1, 2024

- Optional reporting
- Reporting only via manual entry and .csv import

Jan 1, 2025

- Required reporting
- CDA import available for reporting

Sex at Birth (Birth Sex) – Captures sex assigned at birth

- Select from:
  - Male
  - Female
  - Unknown

Sex at Birth (Birth Sex) – Value set

- VSAC link to value set: https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1/expansion
  - Note that UNK is also allowed but not included in that value set as it's just the one nullFlavor value:

6. **SHALL** contain exactly one [1..1] **value** with @xsi:type="CD", where the code **SHALL** be selected from ValueSet **ONC Administrative Sex** urn:oid:2.16.840.1.113762.1.4.1 **STATIC** 2016-06-01 (CONF:3250-32947).
   a. If value/@code not from value set ONC Administrative Sex urn:oid:2.16.840.1.113762.1.4.1 STATIC 2016-06-01, then value/@nullFlavor **SHALL** be "UNK" (CONF:3250-32948).

Table 173: ONC Administrative Sex

Value Set: ONC Administrative Sex urn:oid:2.16.840.1.113762.1.4.1
(Clinical Focus: Gender identity restricted to only Male and Female used in administrative situations requiring a restriction to these two categories.),(Data Element Scope: Gender),(Inclusion Criteria: Male and Female only.),(Exclusion Criteria: Any gender identity that is not male or female.)

This value set was imported on 10/17/2019 with a version of 20190425.
Value Set Source: https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1/expansion

Code	Code System	Code System OID	Print Name
F	Administrative Gender	urn:oid:2.16.840.1.113883.5.1	Female
M	Administrative Gender	urn:oid:2.16.840.1.113883.5.1	Male

Provided courtesy of Sarah Gaunt, Lantana Consulting Group

Gender Identity – Captures patient reported gender

- Select:
  - Male
  - Female
  - Female-to-male transgender
  - Male-to-female transgender
  - Identifies as non-conforming
  - Other
  - Asked but unknown

Gender Identity

- VSAC link to value sets:
  - https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1021.101/expansion
  - https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1114.17/expansion
    (in this case they have created a separate value set for the two allowed nullFlavor codes)

8. **SHALL** contain exactly one [1..1] **value** with @xsi:type="CD", where the code **SHALL** be selected from ValueSet Gender Identity USCDI core urn:oid:2.16.840.1.113762.1.4.1021.101 **DYNAMIC** (CONF:4515-1223).

To represent additional Gender Identities, set nullFlavor="OTH". To represent "choose not to disclose", set nullFlavor="ASKU".

   a. This value **MAY** contain zero or one [0..1] **@nullFlavor**, which **SHOULD** be selected from ValueSet Asked but Unknown and Other urn:oid:2.16.840.1.113762.1.4.1114.17 **DYNAMIC** (CONF:4515-1232).

Provided courtesy of Sarah Gaunt, Lantana Consulting Group

Gender Identity – Value set

Table 242: Gender Identity USCDI core

Value Set: Gender Identity USCDI core urn:oid:2.16.840.1.113762.1.4.1021.101
(Clinical Focus: Concepts that are used to describe a person's socially acknowledged gender that are used, at a minimum, in the USA. This is the gender they identify as. These are not concepts used to describe a person's sexual orientation (who they are attracted to).),(Data Element Scope: gender identity),(Inclusion Criteria: Concepts that can represent a type of gender that as used in the USA. This is not restricted to male and female.),(Exclusion Criteria: Concepts that are improper to use in the USA for gender identity. Concepts used to describe a person's sexual orientation. Concepts that are used to represent when data is absent or not represented in the provided list.)

This value set was imported on 3/16/2022 with a version of Latest.
Value Set Source:
https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1021.101/expansion

Code	Code System	Code System OID	Print Name
407376001	SNOMED CT	urn:oid:2.16.840.1.113883.6.96	Male-to-female transsexual (finding)
407377005	SNOMED CT	urn:oid:2.16.840.1.113883.6.96	Female-to-male transsexual (finding)
446131000124102	SNOMED CT	urn:oid:2.16.840.1.113883.6.96	Identifies as non-conforming gender (finding)
446141000124107	SNOMED CT	urn:oid:2.16.840.1.113883.6.96	Identifies as female gender (finding)
446151000124109	SNOMED CT	urn:oid:2.16.840.1.113883.6.96	Identifies as male gender (finding)

Provided courtesy of Sarah Gaunt, Lantana Consulting Group

Gender Identity – Value set (continued)

Table 243: Asked but Unknown and Other

Value Set: Asked but Unknown and Other urn:oid:2.16.840.1.113762.1.4.1114.17

(Clinical Focus: Data absent reasons specific for representing only asked but unknown and other),(Data Element Scope: any data representation that supports inclusion of data absent reasons),(Inclusion Criteria: Asked but no answer known and Other meant to mean data not available for selection),(Exclusion Criteria: all other codes)

This value set was imported on 3/16/2022 with a version of Latest.

Value Set Source:
https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1114.17/expansion

Code	Code System	Code System OID	Print Name
ASKU	HL7NullFlavor	urn:oid:2.16.840.1.113883.5.1008	asked but unknown
OTH	HL7NullFlavor	urn:oid:2.16.840.1.113883.5.1008	other

Provided courtesy of Sarah Gaunt, Lantana Consulting Group

AUR Module Updates: Previous Application Updates

Malissa Mojica

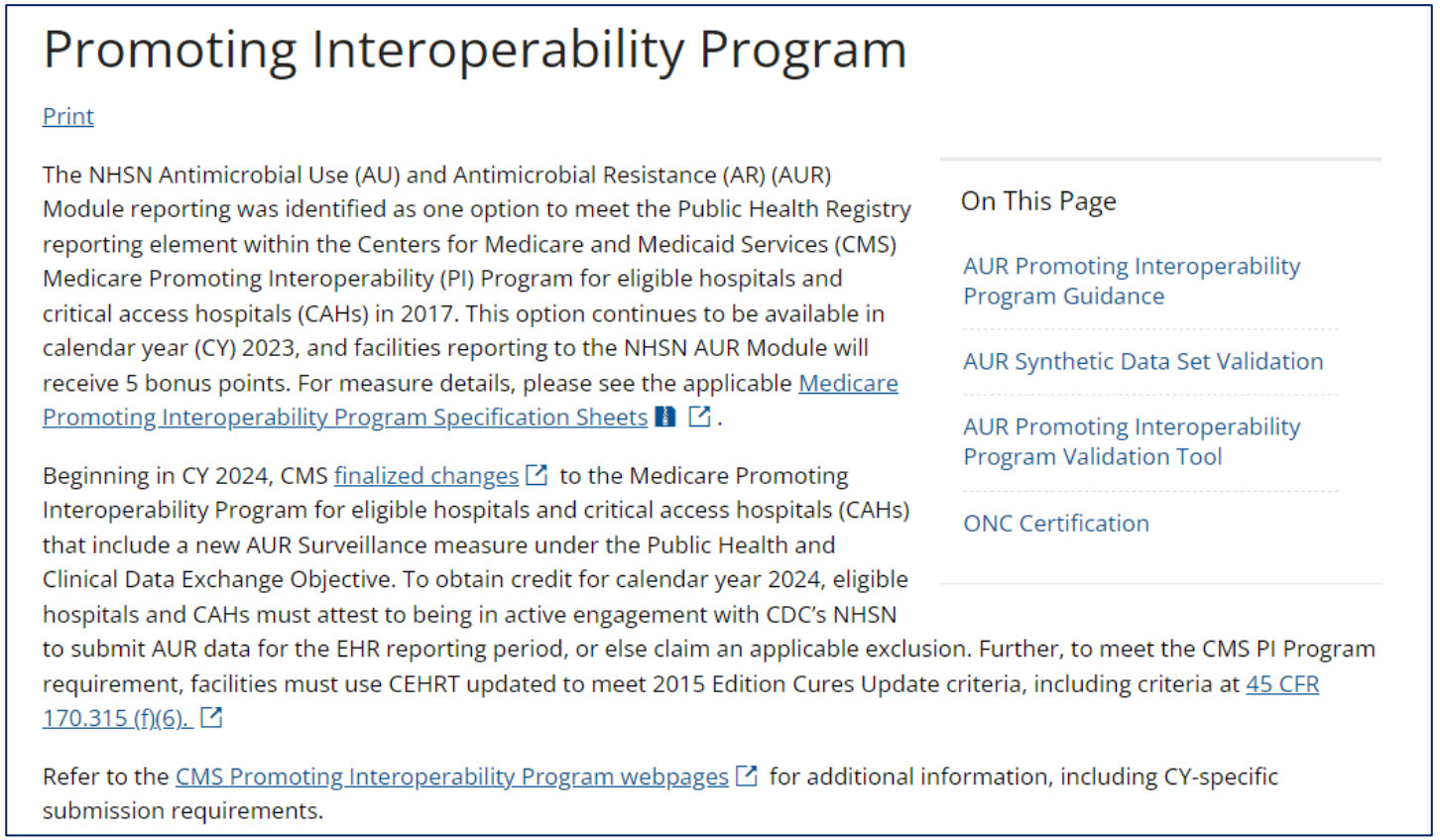
Issue with Jan 2023 AU files is resolved

- **Issue:** There was an issue preventing facilities from successfully uploading January 2023 AU Option files (via manual upload and DIRECT). Specifically, when users attempt to upload AU Option files for January 2023, an error message was generated.

- **Resolved:** NHSN resolved the issue and facilities can upload January 2023 AU Option data.

Update language to PI Program

- Meaningful Use >> Promoting Interoperability
- This updated language was made throughout the app & website



Promoting Interoperability Program

Print

The NHSN Antimicrobial Use (AU) and Antimicrobial Resistance (AR) (AUR) Module reporting was identified as one option to meet the Public Health Registry reporting element within the Centers for Medicare and Medicaid Services (CMS) Medicare Promoting Interoperability (PI) Program for eligible hospitals and critical access hospitals (CAHs) in 2017. This option continues to be available in calendar year (CY) 2023, and facilities reporting to the NHSN AUR Module will receive 5 bonus points. For measure details, please see the applicable Medicare Promoting Interoperability Program Specification Sheets.

Beginning in CY 2024, CMS finalized changes to the Medicare Promoting Interoperability Program for eligible hospitals and critical access hospitals (CAHs) that include a new AUR Surveillance measure under the Public Health and Clinical Data Exchange Objective. To obtain credit for calendar year 2024, eligible hospitals and CAHs must attest to being in active engagement with CDC's NHSN to submit AUR data for the EHR reporting period, or else claim an applicable exclusion. Further, to meet the CMS PI Program requirement, facilities must use CEHRT updated to meet 2015 Edition Cures Update criteria, including criteria at 45 CFR 170.315 (f)(6).

Refer to the CMS Promoting Interoperability Program webpages for additional information, including CY-specific submission requirements.

On This Page

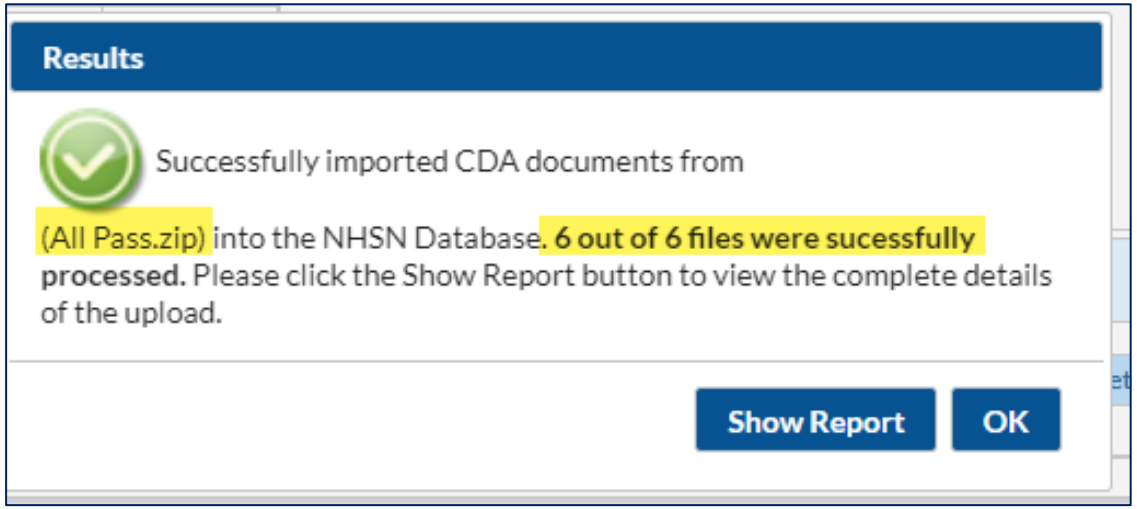
- AUR Promoting Interoperability Program Guidance
- AUR Synthetic Data Set Validation
- AUR Promoting Interoperability Program Validation Tool
- ONC Certification

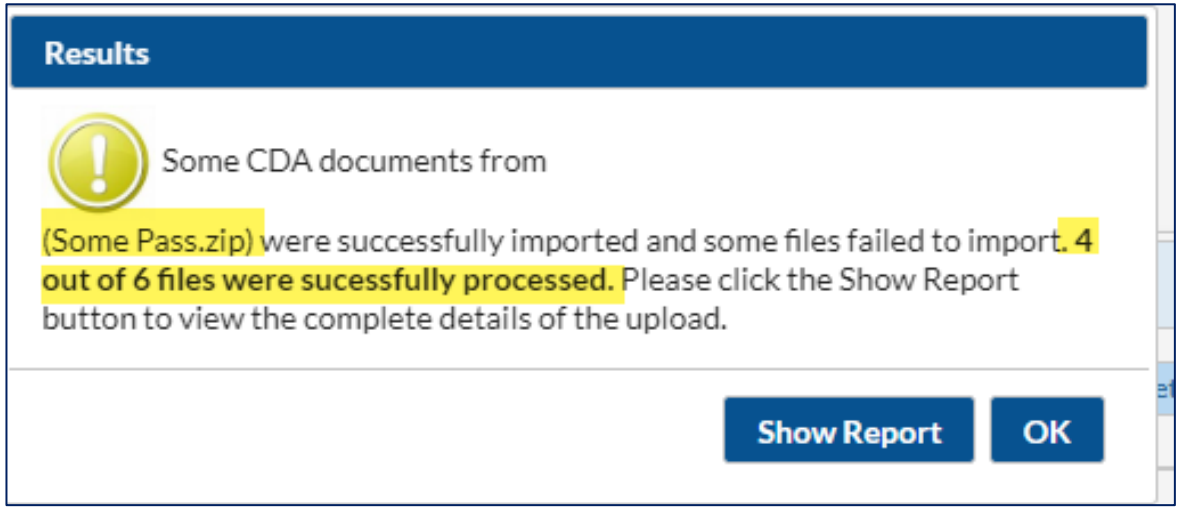
https://www.cdc.gov/nhsn/cdaportal/datainteroperability.html

Update message displayed after manual CDA upload

- After manually uploading CDA files, NHSN generates a message

- Message is now more clear some files failed to upload





Update the AR Drug Susceptibility Test value set display name for imipenem

- Update display name for code IMIPWC (LOINC code: 18932-4) from “Imipenem with Cilastatin” to “Imipenem”
  - Human-readable change only – will not affect what’s accepted by NHSN
- Change reflects true susceptibility test completed by labs and aligns with LOINC description
  - Cilastatin is not an antimicrobial; it enhances the effects of imipenem when administered together in certain situations
  - Cilastatin is not included in susceptibility tests for imipenem

Ineligible locations able to report AU data

- Fix delayed until a future release

- Defect allows facilities to report AU Option data from certain locations not eligible for AUR reporting:
  - Endoscopy Suite (CDC Location Code OUT:NONACUTE:DIAG:GI, HL7 Code 1007-4)
  - Sleep Study Unit (CDC Location Code IN:NONACUTE:CLINIC: SLEEP, HL7 Code 1020-7)
- AUR-eligible locations indicated with a “Y” in the AUR column in Location Codes tab in IDM

AUR Module Updates: Upcoming Releases – 12.0

Virgie Fields

Update to AU Drugs

- Add rezafungin to antifungals
- Potentially add other drugs

	A	B	C	D	E	F	G
1	valueSetName="NHSNAntimicrobialAgentAURPCode				valueSetOid="2.16.840.1.114222.4.11.3360	binding="DYNAMIC"	
2	Store the value in "Code" in the AREvent.arDrug field. Create a map between value and code.						
3	**Planned Version**	**Defect /CR**	**Value**	**Code**	**displayName**	**codeSystem**	**Valueset AURPH**
4			620	AMAN	AMAN - Amantadine	2.16.840.1.113883.6.88	X
5	9.2	2003	641	AMK	AMK - Amikacin	2.16.840.1.113883.6.88	X
6			723	AMOX	AMOX - Amoxicillin	2.16.840.1.113883.6.88	X
7			19711	AMOXWC	AMOXWC - Amoxicillin with Clavulanate	2.16.840.1.113883.6.88	X
8			733	AMP	AMP - Ampicillin	2.16.840.1.113883.6.88	X
21	9.2	2003	2130	CEFAZ	CEFAZ - Cefazolin	2.16.840.1.113883.6.88	X
22			25037	CEFDIN	CEFDIN - Cefdinir	2.16.840.1.113883.6.88	X
23	9.2	2003	20481	CEFEP	CEFEP - Cefepime	2.16.840.1.113883.6.88	X

... | MRP | ARP | **Antimicrobial Ingredients 2022** | AR AST 2022 | Event Type | Procedure Codes 2018 | Pathogen Codes 2023-Preferred | Pathogen Codes 2023-Synonym | Pathogen Cha ...

Update to AR Pathogens

- Add *Citrobacter freundii* complex
- Add *Citrobacter braakii*
- Add *Citrobacter youngae*
- Remove *Lelliottia amnigena* (formally *Enterobacter amnigenus*)
- Plan to refresh Pathogen Roll-up Workbook

	A	B	C	D	E	G	S	AH	AI
1	Sort	Planned Versio	Defect/C	Change Typ	Description for Drop-down in App	New Code	ARO Pathoge	SCTID (U.S. Edition 2021-09	SNOMED Preferred Term
20	row0019	11.1.0	3713	none	Acinetobacter	ACS	X	7757008	Acinetobacter
21	row0020	11.1.0	3713	none	multidrug resistant Acinetobacter	ACS*1	X	446157004	Multidrug-resistant Acinetobacter
22	row0021	11.1.0	3713	none	carbapenem resistant Acinetobacter	ACS*2	X	445721008	Carbapenem resistant Acinetobacter
23	row0022	11.1.0	3713	none	Acinetobacter baumannii	ACBA	X	91288006	Acinetobacter baumannii
24	row0023	11.1.0	3713	none	Acinetobacter calcoaceticus	ACICBA	X	82550008	Acinetobacter calcoaceticus
25	row0024	11.1.0	3713	none	Acinetobacter calcoaceticus-baumannii complex	ACCA	X	113376007	Acinetobacter calcoaceticus-Acinetobacter baumannii complex
26	row0025	11.1.0	3713	none	Acinetobacter haemolyticus	ACHA	X	77045006	Acinetobacter haemolyticus
27	row0026	11.1.0	3713	none	Acinetobacter johnsonii	ACJH	X	252000	Acinetobacter johnsonii
782	row0781	11.1.0	3713	none	Enterobacter cloacae complex	ENCCX	X	414102007	Enterobacter cloacae complex
783	row0782	11.1.0	3713	none	Enterobacter hormaechei	ENTHO	X	114454006	Enterobacter hormaechei

MRP | ARP | Antimicrobial Ingredients 2022 | AR AST 2022 | Event Type | Procedure Codes 2018 | Pathogen Codes 2023-Preferred | Pathogen Codes 2023-Synonym | Pathogen Cha ...

Update to AR Drug Panels

- Add high level LOINC terms for high potency gentamicin and streptomycin for the *Enterococcus* drug panel (AntiP23)

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	valueSetName="NHSNDrugSusceptibilityTestsCode"				valueSetOid="2.16.840.1.11388	binding="DYNAMIC"							
2	Store the value in "Code" in the AREvent.arDrug field. Create a map between value and code.												
3	Planned Version	Defect /CR	Value	Code	displayName	codeSystem	Valueset ARDrugCod	ACS AntiP20	ACS AntiP20U	CA AntiP2	ESP AntiP2	ESP AntiP22U	ENT AntiP23
7	10.1	2744	18864-9	AMP	AMP - Ampicillin	2.16.840.1.113883.6.1	X				X	X	X
30	10.1	2744	41734-5	DALBA	DALBA - Dalbavancin	2.16.840.1.113883.6.1	X						X
31	10.1	2744	35789-7	DAPTO	DAPTO - Daptomycin	2.16.840.1.113883.6.1	X						X
40	10.1	2744	18928-2	GENTA	GENTA - Gentamicin	2.16.840.1.113883.6.1	X	X	X		X	X	X
46	10.1	2744	29258-1	LNZ	LNZ - Linezolid	2.16.840.1.113883.6.1	X						X
53	10.1	2744	41736-0	ORITAV	ORITAV - Oritavancin	2.16.840.1.113883.6.1	X						X
56	10.1	2744	18965-4	PENG	PENG - Penicillin G	2.16.840.1.113883.6.1	X						X
57	10.1	2744	18966-2	PENV	PENV - Penicillin V	2.16.840.1.113883.6.1	X						X
60	10.1	2744	23640-6	QUINWD	QUINWD - Quinupristin-dalfopristin	2.16.840.1.113883.6.1	X						X
62	10.1	2744	18982-9	STREP	STREP - Streptomycin	2.16.840.1.113883.6.1	X						X
65	10.1	2744	73586-0	TEDIZ	TEDIZ - Tedizolid	2.16.840.1.113883.6.1	X						X
66	10.1	2744	88886-7	TELAV	TELAV - Telavancin	2.16.840.1.113883.6.1	X						X
70	10.1	2744	19000-9	VANC	VANC - Vancomycin	2.16.840.1.113883.6.1	X						X
72													

... MRP ARP Antimicrobial Ingredients 2022 AR AST 2022 Event Type Procedure Codes 2018 Pathogen Codes 2023-Preferred Pathogen Codes 2023-Synonym Pathogen Cha ...

Update to AR Event

- Addition of sex at birth and gender identity
  - **Delayed until January 2025**
  - Once change is made, then AU & AR Summary will update to a new IG version to be on the same IG as AR per ONC request

AUR Module Updates: AR Synthetic Data Set

Amy Webb

AR SDS Requirement: May 2023

- **Beginning with May 2023 AR data**
  - AR summary records for May 2023 must include vendorID and SDS validation ID
  - AR event records with specimen collection dates May 1, 2023 and after must include vendorID and SDS validation ID

- 12 vendor software products have been validated!

New AR SDS Package: 1.5

- AR SDS release 1.5
  - Updated fact_CultureResult table to resolve isolate that was only tested for ineligible antimicrobials

- Will be posted soon; notification email to be sent
  - https://www.cdc.gov/nhsn/cdaportal/sds/index.html

- **Vendors that have already passed are NOT expected to re-validate**

Quick aside: AR Option Pathogens

- Duplicate isolates: same species or genus, when identification to species level is not provided, isolated from the same source type (specifically, invasive or non-invasive) from the same patient on the same day

- All organisms listed in the AR Option Pathogen Roll-up Workbook found in the AR Toolkit are eligible for submission
  - **Facilities/vendors should first perform the roll-up of organisms before applying subsequent reporting rules**

AR Option Pathogen Roll-up

- Rollup workbook: lists all **eligible** organisms (1101 codes)

- IDM Pathogen Codes 2023-Preferred tab: lists all SNOMED codes the NHSN application will **accept** (97 codes)

AR Option Pathogen Roll-up continued

- Of the 97 accepted codes, 20 are considered drug-resistant organism codes
  - X in Drug resistant organism column
  - When included in the AR Event CDA, **NHSN automatically rolls these codes up to the parent concept**
  - New Code column shows the parent concept to be saved in the app
  - Remember to take the 20 codes NHSN rolls up into account for the de-duplication rules

	A	E	G	S	AH	AI	AK
1	Sort	Description for Drop-down in App	New Code	ARO Pathogen	SCTID (U.S. Edition 2021-09)	SNOMED Preferred Term	Drug resistant organism
21	row0020	multidrug resistant Acinetobacter	ACS*1	X	446157004	Multidrug-resistant Acinetobacter	X
22	row0021	carbapenem resistant Acinetobacter	ACS*2	X	445721008	Carbapenem resistant Acinetobacter	X
546	row0545	Extended spectrum beta-lactamase producing Citrobacter freundii	CF*3	X	721909006	ESBL Citrobacter freundii	X
775	row0774	multidrug resistant Enterobacter asburiae	ENTAB*2	X	714316001	Multiple drug-resistant Enterobacter asburiae	X
778	row0777	multiple drug-resistant Enterobacter cloacae	ENC*3	X	714317005	Multiple drug-resistant Enterobacter cloacae	X
779	row0778	carbapenem resistant Enterobacter cloacae	ENC*4	X	714007005	Carbapenem resistant Enterobacter cloacae	X
780	row0779	Extended spectrum beta-lactamase producing Enterobacter cloacae	ENC*5	X	721910001	ESBL Enterobacter cloacae	X
2480							

Denom AU | Denom AR | MRP | ARP | Antimicrobial Ingredients 2022 | AR AST 2022 | Event Type | Procedure Codes 2018 | Pathogen Codes 2023-Preferred | Pathogen Codes 20 ...

AR Option Pathogen Roll-up Example

Date	Lab Result	Reported to NHSN?	Justification
January 1	Genus *Acinetobacter* isolated from blood culture		
January 5	Multidrug-resistant *Acinetobacter* was isolated from blood culture		

- Which one(s) to report to NHSN?
  - Both collected in blood so the 14 day rule will apply
  - Review organism roll-up to determine if these meet criteria for being the same species or genus, when identification to species level is not provided

AR Option Pathogen Roll-up Example

AR Option Pathogen Roll-up Workbook

	A	B	C	D	E
1	sort	SNOMED CT Code (2021-09)	SNOMED CT Fully Specified Name	map to - Code	map to - Name
2	row0001	7757008	Genus Acinetobacter (organism)	NA	NA
3	row0002	445721008	Carbapenem resistant Acinetobacter (organism)	NA	NA
4	row0003	1085501000112104	Carbapenemase-producing Acinetobacter (organism)	7757008	Genus Acinetobacter (organism)
5	row0004	446157004	Multidrug-resistant Acinetobacter (organism)	NA	NA
6	row0005	419589005	Asaccharolytic acinetobacter (organism)	7757008	Genus Acinetobacter (organism)
7	row0006	719020002	Asaccharolytic hemolytic Acinetobacter (organism)	7757008	Genus Acinetobacter (organism)
27	row0026	890447005	Acinetobacter courvalinii (organism)	7757008	Genus Acinetobacter (organism)
28	row0027	788668000	Acinetobacter dispersus (organism)	7757008	Genus Acinetobacter (organism)

2023 Mapping | Revision history

AR Option Pathogen Roll-up Example

AR Option Pathogen Roll-up Workbook

	A	B	C	D	E
1	sort	SNOMED CT Code (2021-09)	SNOMED CT Fully Specified Name	map to - Code	map to - Name
2	row0001	7757008	Genus Acinetobacter (organism)	NA	NA
3	row0002	445721008	Carbapenem resistant Acinetobacter (organism)	NA	NA
4	row0003	1085501000112104	Carbapenemase-producing Acinetobacter (organism)	7757008	Genus Acinetobacter (organism)
5	row0004	446157004	Multidrug-resistant Acinetobacter (organism)	NA	NA
6	row0005	419589005	Asaccharolytic acinetobacter (organism)	7757008	Genus Acinetobacter (organism)
27	row0026	890447005	Acinetobacter courvalinii (organism)	7757008	Genus Acinetobacter (organism)
28	row0027	788668000	Acinetobacter dispersus (organism)	7757008	Genus Acinetobacter (organism)

2023 Mapping | Revision history

IDM Pathogen Codes 2023-Preferred tab

	A	E	G	S	AH	AI	AK
1	Sort	Description for Drop-down in App	New Code	ARO Pathogen	SCTID (U.S. Edition 2021-09)	SNOMED Preferred Term	Drug resistant organism
20	row0019	Acinetobacter	ACS	X	7757008	Acinetobacter	
21	row0020	multidrug resistant Acinetobacter	ACS*1	X	446157004	Multidrug-resistant Acinetobacter	X
22	row0021	carbapenem resistant Acinetobacter	ACS*2	X	445721008	Carbapenem resistant Acinetobacter	X
23	row0022	Acinetobacter baumannii	ACBA	X	91288006	Acinetobacter baumannii	
24	row0023	Acinetobacter calcoaceticus	ACICBA	X	82550008	Acinetobacter calcoaceticus	
25	row0024	Acinetobacter calcoaceticus-baumannii complex	ACCA	X	113376007	Acinetobacter calcoaceticus-Acinetobacter ba	
778	row0777	multiple drug-resistant Enterobacter cloacae	ENC*3	X	714317005	Multiple drug-resistant Enterobacter cloacae	X

... | Denom AU | Denom AR | MRP | ARP | Antimicrobial Ingredients 2022 | AR AST 2022 | Event Type | Procedure Codes 2018 | Pathogen Codes 2023-Preferred | Pathogen Codes 20 ...

AR Option Pathogen Roll-up Example

Date	Lab Result	Reported to NHSN?	Justification
January 1	Genus *Acinetobacter* isolated from blood culture	Yes	Patient's first blood culture; Genus *Acinetobacter* is isolated
January 5	Multidrug-resistant *Acinetobacter* was isolated from blood culture	No	Multidrug-resistant *Acinetobacter* will be rolled up to Genus *Acinetobacter* by NHSN; it's been less than 14 days since the last positive culture (1/1) from the patient isolating Genus *Acinetobacter*

AUR Module Updates:
CMS Promoting Interoperability Program

Amy Webb

AUR Module data are required in CY 2024

- Beginning in **CY 2024**, AUR Module data are required under the Public Health and Clinical Data Exchange Objective of the CMS PI Program
- Applies to eligible hospitals and critical access hospitals that participate in the CMS PI Program
- **Measure includes submission of both AU and AR Option data**
- For CY 2024 facilities attest to either:
  - Being in active engagement with NHSN to submit AUR data or,
  - Claim an applicable exclusion

https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms

Two ways to be in active engagement with NHSN

- Option 1 – Pre-production and validation
  - Registration within NHSN
  - Testing & validation of the CDA files
- Option 2 – Production submission
  - Submitting production AU & AR files to NHSN
    - CY 2023 – 90 continuous days of AUR data submission
    - CY 2024 – 180 continuous days of AUR data submission

- **Note:** Beginning in CY 2024, facilities can only spend one calendar year in Option 1 (pre-production and validation)

Vendor requirements

- NHSN validated
  - AU and AR SDS
  - Application will prevent upload if files don’t contain validated vendor credentials

- ONC certified
  - Process outlined by ONC

Vendor nice to have

- To attest to “Option 1 – Pre-production and validation”, facilities have to send test files for validation
  - Same XMLs sent to NHSN just containing test data
  - 1 file for each type: AU summary, AR event, AR summary

- Possible to provide test files available for facilities?

AUR Module Updates:
AU Data Quality Outreach

Laura Blum

Incompatible routes of administration outreach

- While preparing for 2021 AU Option Data Report, noted antimicrobial days reported for certain antimicrobials via routes for which they are not commercially available
  - May represent off-label use or a potential mapping error
- Notified facilities with AU data reported via incompatible, off-label, or unusual routes during 2021 and 2022
  - Asked facilities to review affected data, correct mappings going forward, and correct then re-upload incorrect retrospective data (if possible)
- Thank you to everyone who helped facilities with the request!

Data quality outreach summary

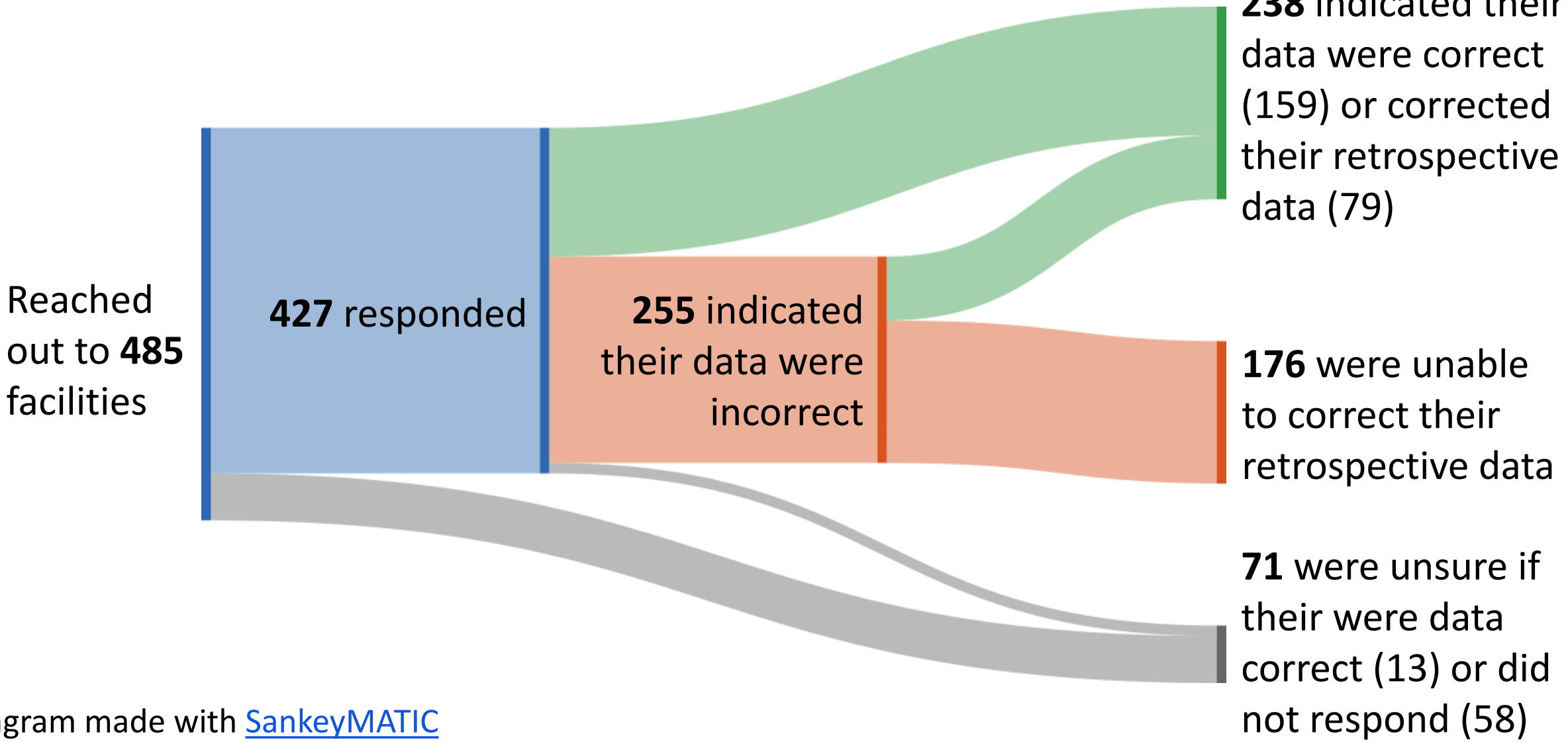


Diagram made with SankeyMATIC

Clarification

- Occasionally, we send outreach for antimicrobial administrations that seem unusual or we would like to learn more about
- Goal is to determine if the data submitted to NHSN are correct based on which routes of administration were reported
- **Facilities should continue reporting data based on how the drugs are being administered to patients**, regardless of what formulation is used and whether it's considered incompatible, off-label, or unusual use
  - Facilities may ask to stop reporting antimicrobials administered via off-label or unusual routes to avoid receiving emails
  - Please say no to this request; NHSN would like to receive **all** antimicrobial administrations from **all eligible routes**

Which routes to report

- Eligible routes:
  - ✓ Intravenous (IV)
  - ✓ Intramuscular (IM)
  - ✓ Digestive (mouth to rectum)
  - ✓ Respiratory (inhaled)

- Examples of **ineligible** routes:
  - ✕ Intracavity including intrapleural, intraperitoneal, intrapericardial
  - ✕ Topical including ophthalmic (in the eye) and otic (in the ear)
  - ✕ Antibiotic locks
  - ✕ Intraventricular
  - ✕ Irrigation
  - ✕ Intraductal

Key takeaways

- Intrapleural route is **not** eligible
- While intranasal antimicrobial administrations start in the nose, which is part of the respiratory system, irrigation is the clinical purpose of most intranasal administrations and they should be excluded
- For antimicrobial mouthwash, “swish and swallow” counts as digestive while “swish and spit” does not and should be excluded
- Inhalation powder mixed into bone cement for the purpose of infection prevention during surgery should be excluded
- Antimicrobials used for irrigation via NG tube as preparation for organ donation are eligible digestive antimicrobial use for the AU Option
  - Note: Other NHSN modules have exclusions for organ donation

AUR Module Updates: Miscellaneous Updates

Allison Iskra

Poll: Does your software support succession management if users simply re-export the files from your system?

- Facilities receive an error message when trying to re-upload data that are already in NHSN when succession management is not in place to increase the version number

Facility ID	Event Type	Event Date	CDA File Name	setId	*setId Already Exists in the Database	CDA Processing Date/Time Stamp
Reason for failure:						
33617	AR	02/02/2022	ENTFS_2022FEB2.xml	2.16.840.1.113883.3.117.1.1.5.2.1.1.1-AntiP23Ur_ENTFS_2022	*Yes-setId found in database	19/Apr/2023 13:17:11 EDT
	1.1	The submitted document version 1 must be greater than the existing record version of 1. Please use CDA succession management to update.				
	1.2	A version 1 document already exists for setID (2.16.840.1.113883.3.117.1.1.5.2.1.1.1-AntiP23Ur_ENTFS_2022). To update the record, you must use succession management.				

- If your software does not currently support succession management, we strongly support the implementation of it to reduce user/facility confusion

Annual training sessions posted soon

- The annual training sessions should be posted in the next couple weeks on the AUR Training webpage AUR Training | PSC | NHSN | CDC and the CDC NHSN Annual Training Webpage Annual Training | NHSN | CDC
- AUR sessions from 2023 Annual Training include:
  - Priorities for Hospital Core Element Implementation
  - AUR Module reporting for the CMS Promoting Interoperability Program (PI Program)
  - AU Option Reporting
  - AR Option Incidence and Prevalence Reports
  - AR Option Benchmarking Metrics

NHSN Pre-Production Test Site (NPPT)

Hamna Baig

NHSN Pre-Production Test Site

- Copy of the NHSN development environment
- Includes Analysis and Reporting (A&R) functionality
- Does not include DIRECT CDA Automation or Groups
- No SAMS credentials required
- To enroll – complete form found at https://www.cdc.gov/nhsn/cdaportal/datavalidation/toolsandtestsites.html
- Send completed form to the nhsncda@cdc.gov mailbox

NHSN Pre-Production Test Site (NPPT) cont.

- V11.3.0.4 is current environment
  - Reminder: Read “Important Message” at login
- Blast email will be sent out when NPPT is upgraded to new version
  - V11.4 will be available mid-June
- Report any issues you find to the nhsncda@cdc.gov mailbox

Miscellaneous

Sylvia Shuler

DIRECT CDA Automation Updates

- ~77 direct addresses and > 9,500 facilities sending via DIRECT
- DIRECT
  - Batch submission process
  - No immediate reply
  - Turnaround time based on volume of messages in the queue
- New to implement DIRECT?
  - DIRECT toolkit on the NHSN website http://www.cdc.gov/nhsn/cdaportal/importingdata.html#DIRECTProtocol
  - Contact NHSNCDA@cdc.gov for any questions or to set up an onboarding discussion

CDA Version Support

- CDA support: https://www.cdc.gov/nhsn/cdaportal/index.html
- Toolkits: https://www.cdc.gov/nhsn/cdaportal/toolkits.html
- Guide to CDA versions: https://www.cdc.gov/nhsn/cdaportal/toolkits/guidetocdaversions.html

Guide to CDA Versions

Print

For creating CDA files, please see the specific Implementation Guide (IG) and its associated reference materials.

The table below describes the specific Implementation Guide (IG) to be used for each component based on the event/insertion/procedure/specimen collection dates (as applicable) for each year.

Download the corresponding CDA Toolkits for the corresponding year.

Events or Denominators	2023	2022	2021	2020
CDA Toolkit Release	11.1	10.1	9.5 & 10.0	9.4
DIALYSIS				
Dialysis Event	R3-D4	R3-D4	R3-D4	R3-D1.1
Dialysis Denominator	R3-D3	R3-D3	R3-D3	R3-D3
EVENTS				
Primary Bloodstream Infection (BSI)	R4-D1	R4-D1	R3-D3	R3-D3

CDA Version Support (continued)

- Implementers can also use the HL7 GitHub website for latest IG Guides
- HL7 GitHub site (https://github.com/HL7/cda-hai) also includes:
  - XML
  - Related files
  - Schematron
  - CDA Schema
  - Samples
  - Stylesheet

Helpful NHSN Resources

- NHSN Newsletter: https://www.cdc.gov/nhsn/newsletters/index.html

- Release Notes and Communication Updates: https://www.cdc.gov/nhsn/commup/index.html

- CDA Webinars: https://www.cdc.gov/nhsn/cdaportal/webinars.html

NHSN Reminders

- Welcome feedback
- Offer individual vendor conference calls
- Make sure you are on the NHSNCDA email distribution list
- Visit the CDA Submission Support Portal (CSSP): https://www.cdc.gov/nhsn/cdaportal/index.html

CDA Submission Support Portal (CSSP)

Toolkits, FAQs, webinars and resources for testing and validation for CDA implementers.

Thank you!

Questions?

NHSNCDA@cdc.gov

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

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