# Fall 2023 NHSN Vendor Meeting

September 11, 2023

# Agenda

- Introduction
- General NHSN Release Overview
- Future Release Updates
- FHIR 101
- Patient Safety Component Digital Measures
- Sex at Birth & Gender Variable Update
- AUR Module Updates
- LTC: EHR Implementation for Nursing Homes
- NHSN Pre-Production Test Site (NPPT)
- Miscellaneous
- 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 Overview

Pamela Crayon

# NHSN Release Schedule Overview

- Continuing one major release at the end of the 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 11.6
  - Scheduled for October 21, 2023
  - Defect fixes will be effective post deployment
  - CRs will be effective October 23, 2023
- Release 12.0
  - Scheduled for December 9, 2023
  - Defect fixes will be effective post deployment
  - CRs will be effective January 1, 2024

# Future Release Updates

Hamna Baig

# Future Release 12.0 – December 2023

- Pediatric Ventilator Associated Event (PedVAE): Update the antimicrobial list
- 2024 Pathogen Code Updates
  - Synonyms (column header: Term Type = S)
    - No longer be maintained in the IDM; All existing synonyms will be marked “I” for inactive in the IDM
    - No longer be displayed in the application drop-down list
    - Launching a new, interactive web-based browser configured to enable NHSN users to identify any synonym in SNOMED CT (U.S. Edition 2022-09) for the 2,278 active concepts in our Pathogen Codes 2024 resource.
      - Training will be provided in December 2023
    - A supplemental terminology artifact will be provided as a companion file.

# Future Release 12.0 – December 2023 (cont.)

- 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 101

Dave DeRoode

# NHSN Adoption of FHIR

- Digital Quality Measure (dQM) development
  - Expression of NHSN's reportable population(s)
  - FHIR's Clinical Reasoning Module
    - Measure evaluation; (CQL)
  - dQM tested using synthetic test data and site/EHR sandboxes
- dQM execution
  - NHSNLink being piloted
    - Census provides all possible patients to be evaluated
    - RESTful queries for clinical Resources (i.e. Patient, Encounter, Condition, etc.)
    - *Evaluated against Measure* determine reportability
      - Reportable Patients queried for Supplemental Data Elements
    - Report to NHSN as a FHIR *Bundle*
      - Ingested into NHSN databases for normalization and analysis
- Existing open-source validation tooling

# Examples of FHIR Resources requested

**For Pilot Purposes (subject to change)**

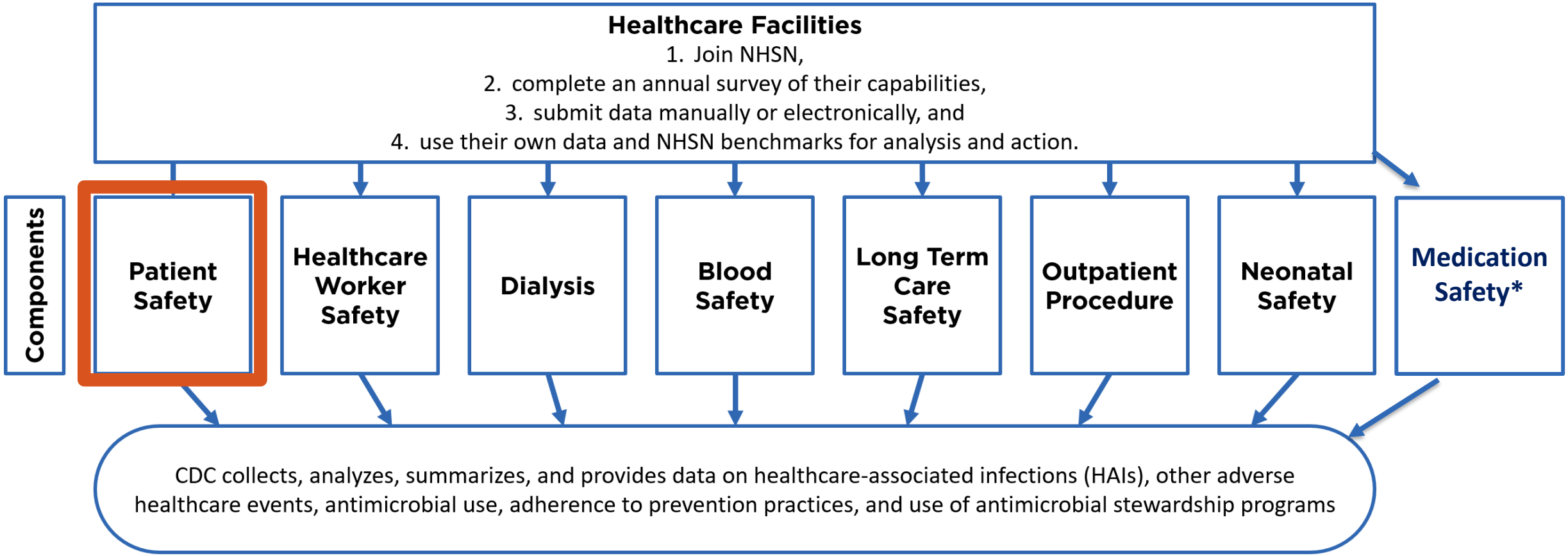
| Table of Contents - Resources & Profiles | Hypoglycemia | HT-CDI and HOB |
|---|---|---|
| **FREQUENCY** | MONTHLY | MONTHLY |
| **INITIAL POPULATION - CQL** | all Inpt, ED, OBS **+ ADD** | all Inpt, ED, OBS |
| Condition - US Core | Entire Resource – MS* | Entire Resource - MS |
| Coverage | Entire Resource - MS | Entire Resource - MS |
| Diagnostic Report (Lab) - US Core | N/A | Entire Resource - MS |
| Encounter-US Core | Entire Resource - MS | Entire Resource - MS |
| Implantable Device - US Core | N/A | Entire Resource - MS |
| Laboratory Result Observation - US Core | Entire Resource - MS | Entire Resource - MS |
| Location-US Core | Entire Resource - MS | Entire Resource - MS |
| Medication-US Core | Entire Resource - R | Entire Resource - MS |
| MedicationAdministration | Entire Resource - R | Entire Resource - MS |
| MedicationRequest-US Core | Entire Resource - R | Entire Resource - MS |
| Observation | **Entire Resource - MS** | **Restricted to NHSN requirements - MS** |
| Patient - US Core | **Restricted to NHSN requirements - R** | **Restricted to NHSN requirements - R** |
| Procedure -US Core | N/A | Entire Resource - MS |
| Service Request | Entire Resource - MS | N/A |
| Specimen | Entire Resource - MS | Entire Resource - MS |

*If the data element is available in the FHIR API/EHR, the data element **SHALL** be provided (either through submission or response to a query) for measure calculation or risk adjustment.

# Patient Safety Component Digital Measures

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 (e.g. 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 2024 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 **Digital Measure 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
- Q2 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

- Q4 2023 (anticipated):
  - CSV Beta version pre-production module will launch for pilot testing
  - Review and revise as per Beta testing results
- Q2 2024:
  - FHIR Beta version pre-production module will launch for pilot testing
  - Review and revise as per Beta testing results

# 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 file 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 (multiple selection):
  - 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 – Release 11.5

Allison Iskra

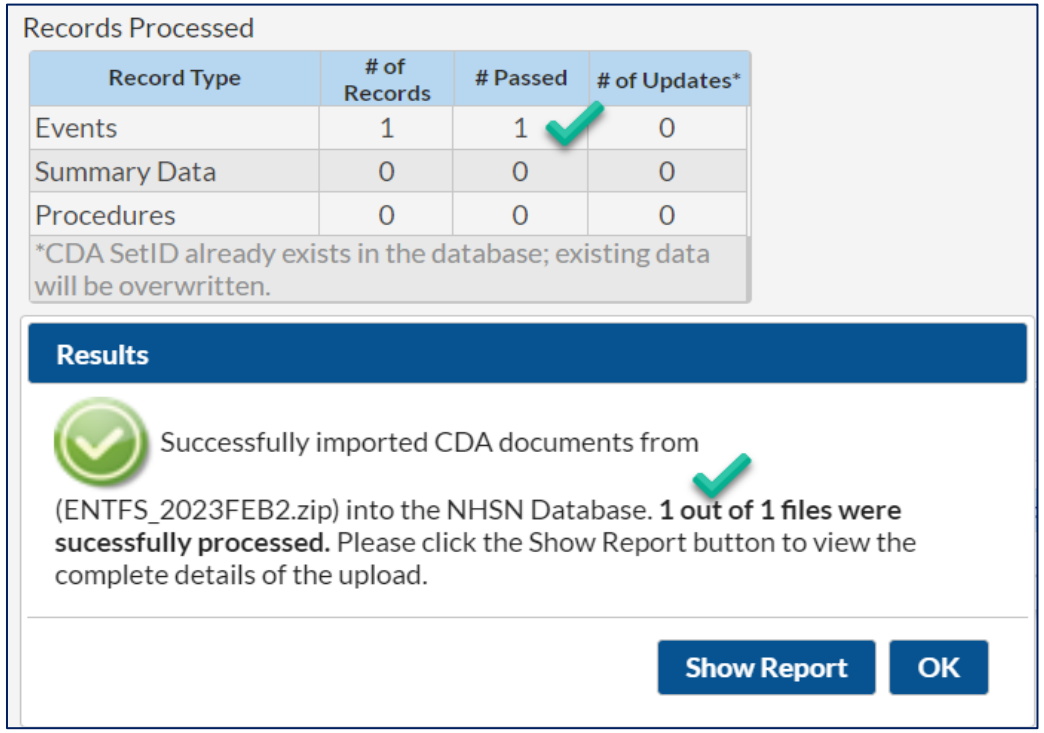
# AR Event author section defect fixed

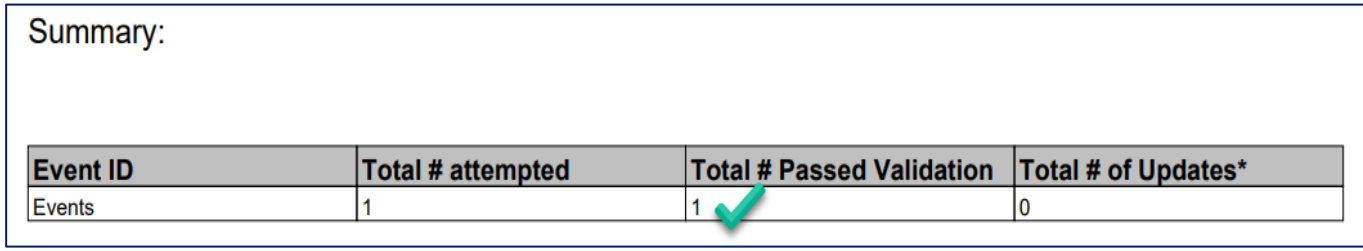
- Application was requiring optional author section fields be included in the file for successful upload for events May 2023 and forward
- Facilities should retroactively upload their AR Event files for May 2023 to present
- Remember: Beginning 05/2023, AR Event files must contain the appropriate vendor OID and SDS validation ID in the author section

```
61  <author>
62    <time value="20080701"/>
63    <assignedAuthor>
64    <!--root=vendor OID; extension is assigned SDS Validation ID -->
65      <id root="2.16.840.1.114222.4.3.12.17" extension="AR_SDS_ID"/>
66
67    </assignedAuthor>
68  </author>
69
```

# Pop-up message during manual CDA upload fixed

- Defect caused the results pop-up to incorrectly populate the number of files that successfully uploaded
- Occurred when files passed the initial submit but failed on the second submit
- Results pop-up now reflects the same number of passing files as the PDF report



# SRIR & pSIR now available!

- Added two new analysis reports for the AR Option
- Standardized Resistant Infection Ratio (SRIR)
  - # Observed resistant infections / # Predicted resistant infections
  - Seven AR phenotypes: MRSA, MDR *P. aeruginosa*, VRE, CRE, FQ-resistant *P. aeruginosa*, FQ-resistant Enterobacterales, and ESC-resistant Enterobacterales
- Pathogen-specific Standardized Infection Ratio (pSIR)
  - # Observed infections of specific pathogens / # Predicted infections of specific pathogens
  - Four pathogens/pathogen groups: Enterobacterales, *Enterococcus*, *S. aureus*, and *P. aeruginosa*

# AUR Module Updates: Upcoming Releases – Release 11.6

Terence Robinson

# IDM Only Fix – URINCATHSPC should not be listed as a CSF specimen type in Specimen Source tab

- URINCATHSPC (urinary catheter specimen (specimen)) to has an X in column K (AR_CSF Specimen) of the Specimen Source tab of the IDM. This is a urine specimen and should not list an X in column K.

- Once defect has been resolved, specimen type will not be listed as a CSF specimen group.

| | A | B | C | D | E | F | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Planned Version | CR/ Defect | NHSN Code | Concept ID | preferred term | Valueset: ARSpecimenSource | AR_LRI Specimen | AR_Blood Specimen | AR_CSF Specimen | AR_Urine Specimen |
| 276 | | | URINARSPC | 122575003 | Urinary specimen (specimen) | X | | | | X |
| 277 | 8.6 | 1560 | URINCATHSPC | 122565001 | urinary catheter specimen (specimen) | X | | | X | X |
| 278 | 11.1.0 | C3219 | URINECATHETER | 16221251000119100 | Urine specimen obtained via straight catheter (specimen) | X | | | | X |
| 279 | 11.1.0 | C3219 | URINECYST | 734443003 | Urine specimen from ureter obtained by cystoscopy (specimen) | X | | | | X |
| 280 | 8.6 | 1560 | URISPCBLAD | 446130001 | urine specimen from bladder (specimen) | X | | | | X |
| 281 | 8.6 | 1560 | URISPCBLADCY | 699285000 | urine specimen obtained from bladder via cystoscopy (specimen) | X | | | | X |
| 301 | 8.6 | 1560 | VENCORDBLDSPC | 703451007 | venous cord blood specimen (specimen) | X | | X | | |
| 302 | 11.1.0 | C3219 | VENPLASSPC | 703432000 | venous plasma specimen (specimen) | | | | | |
| 303 | | | VESICLE | 258482009 | Vesicle fluid sample (specimen) | | | | | |
| 304 | 11.1.0 | C3219 | VOIDEDURINE | 16221491000119100 | Voided urine specimen (specimen) | X | | | | X |

AntiB - 2021 | AntiB_10.0 | AntiB | Criteria | SSI_Specific Event Type | Specific Event-Criteria BR | MDRO Definitions | CDAD Definitions | Specimen Source | AntiP | LT Event

# AUR Module 2024 Changes – Release 12.0

Virgie Fields

# Update to AU Option Drugs

- Add: Rezafungin, Sulbactam/Durlobactam
- Remove: Gemifloxacin, Quinupristin/Dalfopristin

| | 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 Option 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 Option 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 ...

# Protocol updates not affecting CDA files (1)

- Clarification on isolate ID/accession number
  - Isolate identifier unique for each isolate within laboratory based upon the isolate being reported with its own AST results.
  - For example, a urine specimen yields an *E. coli* isolate and a *K. pneumoniae* isolate and both have AST performed and reported; each isolate should be reported with a unique isolate identifier.

# Protocol updates not affecting CDA files (2)

- Clarification on patientID
  - Alphanumeric patient ID assigned by the hospital and may consist of any combination of numbers and/or letters. This ID remains the **same** for the patient across all visits and admissions for all NHSN reporting.

# Protocol updates not affecting CDA files (3)

- Clarification that encounter starts once patient has been triaged (both AU and AR) even though patient may not have a bed
  - Start counting for both:
    - Numerators (AR specimens, AU drugs administered) and
    - Denominators (AR encounters & AU days present)
  - For outpatient locations: ED, pediatric ED, 24-hour observation area

# Protocol updates not affecting CDA files (4)

- AR Events can only include final interpretation (S, SDD, I, R, NS) for the drugs in the panel in Appendix F of AUR Module Protocol
  - And specific test results for the MIC, e-test and disk diffusion tests if available
- Also include two extra tests specific to *S. aureus* (Penicillin-binding protein 2a-agglutination and Polymerase chain reaction (PCR) mec-gene) (positive/negative/unknown)

# Protocol updates not affecting CDA files (4) (cont.)

- Cannot report tests that are used only to aid decision making/help generate final interpretation (example: cefoxitin screen, inducible clindamycin test)
  - But we want the final interpretation provided to clinician to be reported in AR Event
- Example: if the lab updated the result for erythromycin based on the result of the inducible clindamycin test, you should report the changed erythromycin result (same result reported to clinician) to NHSN

# AUR Module Updates:
# AR and AU Synthetic Data Set

Malissa Mojica

# AR SDS Requirement since May 2023

- AR SDS validation must be completed prior to submission of 2023 AR Data
  - AR summary records for May 2023 and forward must include the valid vendorID and SDS validation ID
  - AR event records with specimen collection dates May 1, 2023 and forward must include vendorID and SDS validation ID
- If information is missing, the file will fail with the error “The AR Event file does not contain a valid Vendor OID and/or a valid SDS Validation ID. Please correct the information in the CDA file and re-upload the file.”

# AU SDS Release 5.0

- Plan to update the AU SDS to v5.0
- Includes changes to bring the dataset up to current standards
  - Uses 2023 dates, required drugs/codes, and updates to the admissions counting logic to match AR SDS
- Vendors will be expected to revalidate using AU SDS v5.0 prior to January **2025**
- We'll send out an email once it's been posted.

# CMS Promoting Interoperability (PI) Program Requirement

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 – Validated data production
  - 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)

# Option 1 – Testing and validation of AUR CDA files

- 1 test file for each file type:
  - AU
  - AR Event (numerator)
  - AR Denominator
- Facilities send to NHSNCDA@cdc.gov
- **Please let your facilities know if you have test files to provide them**

> NHSN invites your facility to begin the testing and validation stage. Please send the following test CDAs to the nhsncda@cdc.gov mailbox:
>
> 1. Antimicrobial Use Summary CDA
> 2. Antimicrobial Resistance - Numerator CDA (aka AR Event)
> 3. Antimicrobial Resistance - Denominator CDA (aka AR Summary)

# Vendor validation – NHSN SDS vs ONC

- Vendors are required to be **both** NHSN SDS validated and ONC certified
- SDS validation tests whether vendor software can correctly apply rules of the protocol
- ONC certification tests whether vendor software can produce AU and AR files that pass basic schema validation

# AUR-specific PI Program resources

- https://www.cdc.gov/nhsn/cms/ach.html

## Antimicrobial Use and Resistance

Operational Guidance for reporting AUR data – August 2023 [PDF – 239 KB]

AUR Module Reporting for the CMS Promoting Interoperability Program – March 2023

YouTube

Slide set [PDF – 3 MB]

FAQs: AUR Reporting for the CMS Promoting Interoperability Program – June 2023

Promoting Interoperability – Guidance for Facilities – March 2023 [PDF – 250 KB]

# Data Quality Outreach

Laura Blum

# AUR Module Data Reports

- AU Option Data Report
  - Provide summaries of SAAR distributions and percentages of use within SAAR antimicrobial agent categories in adult, pediatric, and neonatal locations since 2019
  - 2022 AU Option Data Report currently in progress
- AR Option Data Report
  - Currently in progress and will be available for the first time late 2023/early 2024!

AUR Module Data Reports: https://www.cdc.gov/nhsn/datastat/aur-reports.html

# 2022 AU Option Data Report outreach

- Performed data quality outreach for issues typically excluded from AU Option Data Report to give facilities a chance to correct them prior to data freeze on 8/1/2023
- Outreach included:
  - Specific data quality issues that required data to be corrected or deleted (202 facilities)
  - Reminder to fill out 2022 PSC Annual Hospital Survey (8 facilities)
  - Reminder that facilities need at least 9 months of AU data in 2022 to be included in AU Option Data Report (all facilities submitting AU Option data)

# 2022 AR Option Data Report outreach

- Performed data quality outreach for issues that may result in exclusion from AR Option Data Report to give facilities a chance to correct them prior to data freeze on 9/1/2023
- Outreach included:
  - Specific data quality issues that required data to be corrected or deleted (272 facilities)
  - Reminder to fill out 2022 PSC Annual Hospital Survey (3 facilities)
  - Request to review responses to questions about revised Clinical and Laboratory Standards Institute breakpoints on the 2022 Patient Safety Annual Facility Survey (339 facilities)

# Data quality within vendor systems

- We will try to allow more time to resolve systemic issues in future data quality outreach and provide vendors a summary of items included in the outreach
- Ensure FacWideIN days present and patient days do not include outpatient locations, regardless of what is selected in the monthly reporting plan
- Pay special attention to how antimicrobial days, days present, and patient days are calculated for locations with unconventional patient movement (e.g., procedural areas, neonatal/post-partum, outpatient)
- Reach out if you need help validating or calculating AUR Module metrics: NHSN@cdc.gov

# 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 manual nursing home reporting
- Created an implementation guide in partnership with Lantana Consulting Group to develop electronic HAI reporting standards based on CDA and FHIR

# Project Purpose & Objectives

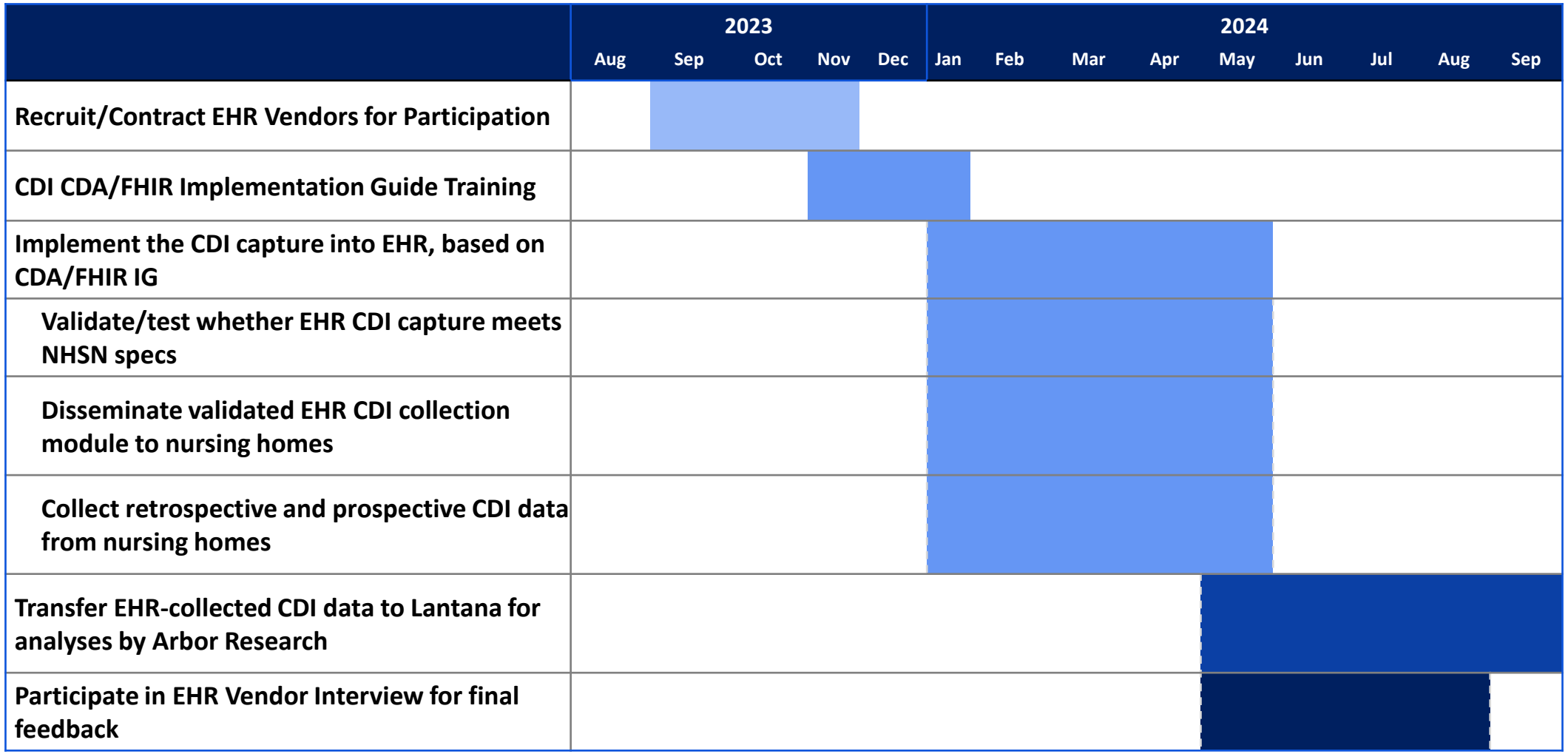
Ensure that CDA implementation guidance enables EHR systems to abstract data in accordance with NHSN protocols on behalf of nursing homes to **reduce manual nursing home data collection**

- 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
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Recruit/Contract EHR Vendors for Participation
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 11.5 & 11.6

- **Release 11.5 (September 2023)**
  - Denominator for LTCF LabID CDA Implementation (Manual Import)
  - 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 11.6 (October 2023)**
  - Direct automation for LTCF LabID Events CDA Imports
    - LTCF LabID Events CDA for Manual Import was implemented in December, 2022

# 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.

- V11.5.0 is current environment
  - Reminder: Read “Important Message” at login
- Blast email will be sent out when NPPT is upgraded to new version
  - V11.6 will be available late October
- 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

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.

# Additional Vendor Engagement Opportunities

- 1-1 meetings with NHSN
  - Opportunity to ask questions, receive updates and dive deeper into discussions around specific topics
  - Send a request to NHSNCDA@cdc.gov to schedule
- Vendor FHIR Training coming in Q1 2024
- Additional vendor communication channels coming soon!

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.