



NHSN Analysis for Digital Quality Measures (dQM)

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Objectives

By the end of this presentation, you will be able to:

- Understand data flow and data processing for **NHSN's new digital quality measures**
- Explain how the **NHSN Digital Measure Reporting Plan** is related to data analysis reports for NHSN digital quality measures
- Identify where facilities can view **data analysis reports** for NHSN digital quality measures

Overview of NHSN Digital Quality Measures

NHSN Digital Quality Measures (dQMs) to Drive Patient

Safety

Fully-automated, digital quality measures based on standards, measurement science, and clinical science with rigorous benchmarking and appropriate risk-adjustment used to drive patient-safety

Manual and
Semi-
Automated
Measures



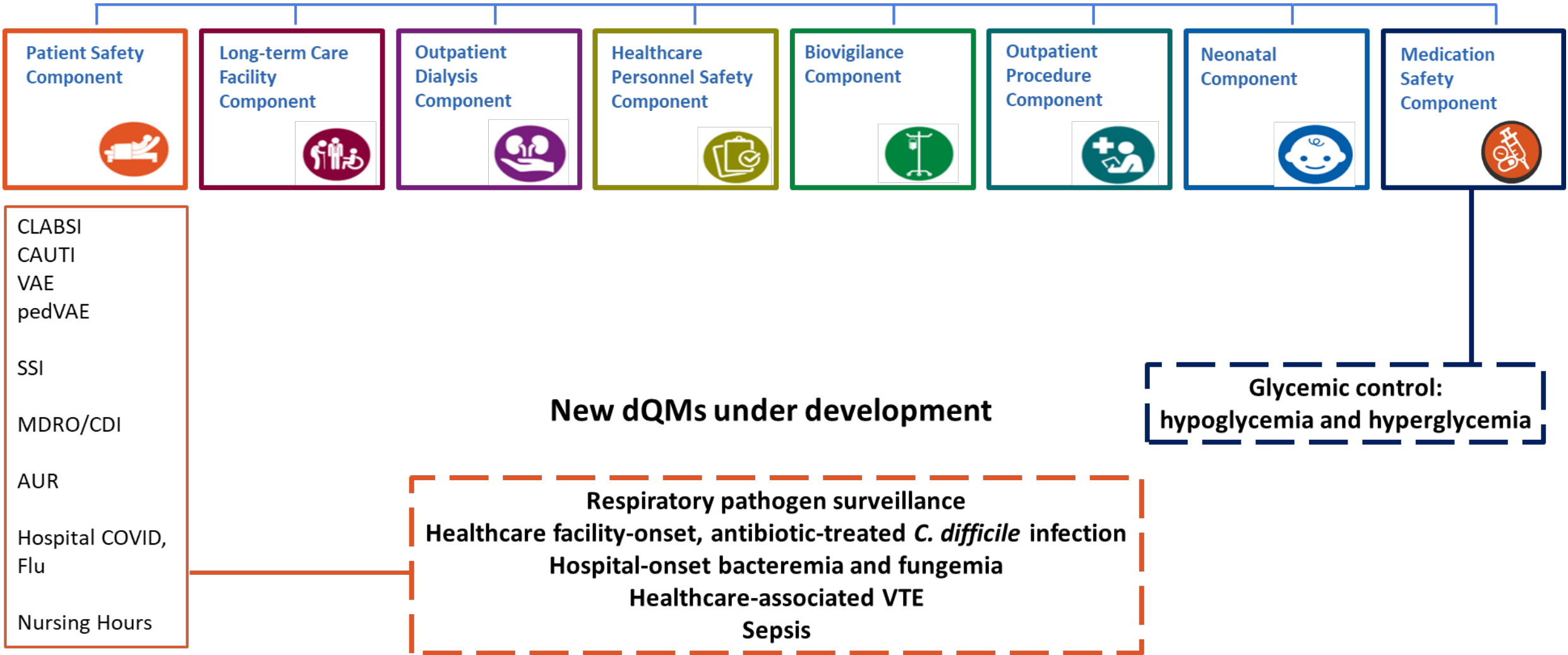
Digital
Quality
Measures

Benefits of Digital Quality Measures

- ✓ *Reduce time* for data collection
- ✓ Provide *patient-level* data for risk adjustment and stratification
- ✓ *Remove potential biases* due to different interpretations
- ✓ *Adjust* measures quickly in response to changes in practices

NHSNLink: NHSN's FHIR Application

- NHSN dQMs are reported via NHSNLink, NHSN's open-source public health application for FHIR reporting
- **FHIR**[®]: Fast Healthcare Interoperability Resources
- International standard for healthcare-data exchange, published by Health Level Seven International (HL7[®])
 - A standards-based approach to accessing “patient-level” (vs. aggregated) data
 - Increasingly adopted by EHR vendors, hospitals, and government agencies
 - Most U.S. EHRs have FHIR capability, but may need to enable the FHIR API
- NHSNLink connects securely with the facility's EHR endpoint and pulls selected FHIR “resources” required for dQM calculation



AUR: antimicrobial use and resistance; CDI: *Clostridioides difficile* infection; CAUTI: catheter-associated urinary tract infection; CLABSI: central line-associated bloodstream infection; MDRO: multi-drug resistant organism; SSI: surgical site infection; VAE: ventilator-associated event; pedVAE: pediatric VAE

NHSN Digital Measure Reporting Plans

Digital Measure Reporting Plan (DMRP): Purpose

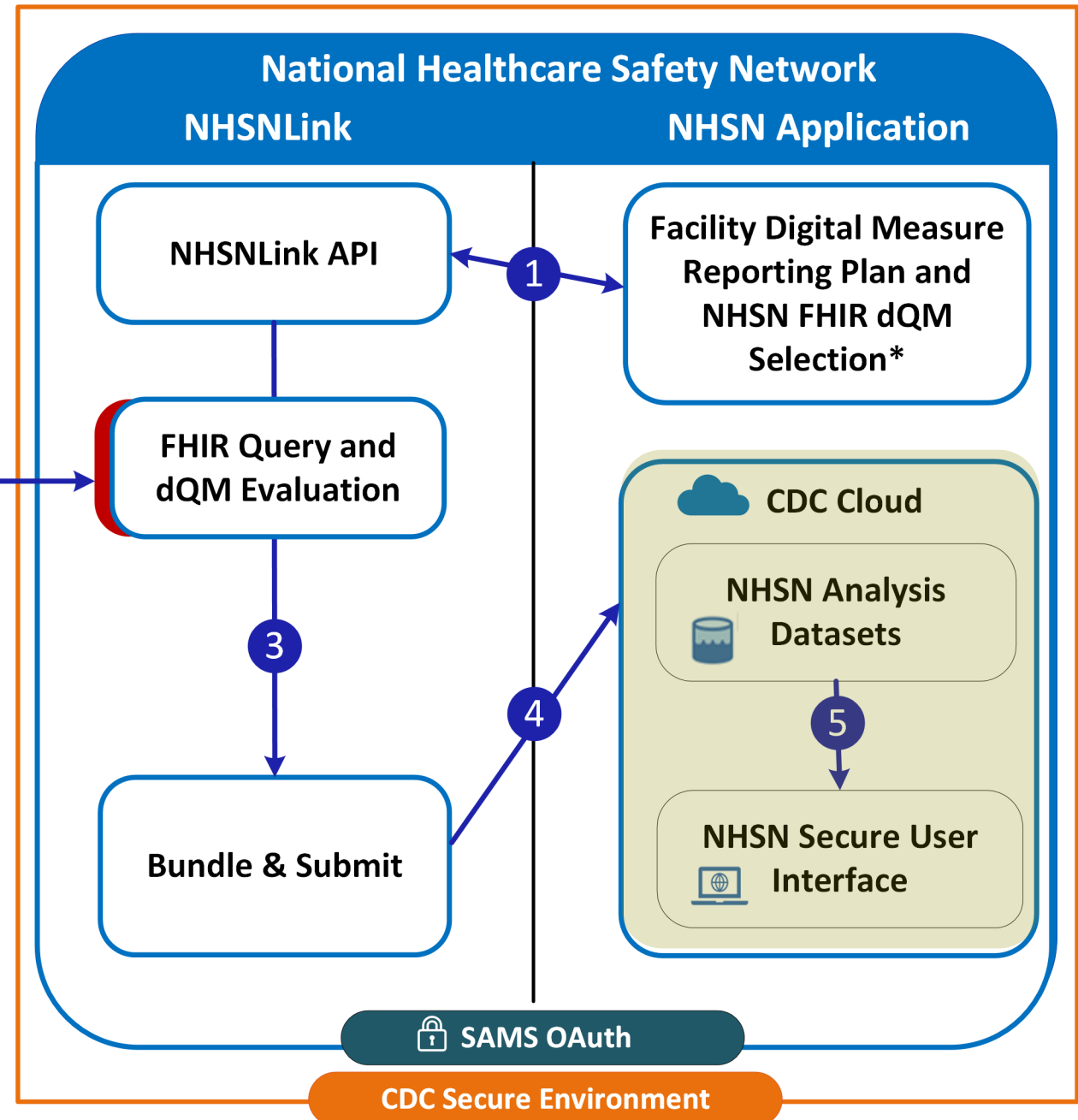
- ☑ Authorizes NHSN to query the facility's FHIR server to collect EHR data elements (per NHSN dQM protocol)
- ☑ Signals facility commitment to adhere to dQM reporting requirements
 - Including, use of NHSN location codes and other standardized value sets (e.g., RxNorm, LOINC)
- ☑ Specifies the measure(s) and reporting period for which data analysis reports will be available

Data Flow for NHSN Digital Quality Measures

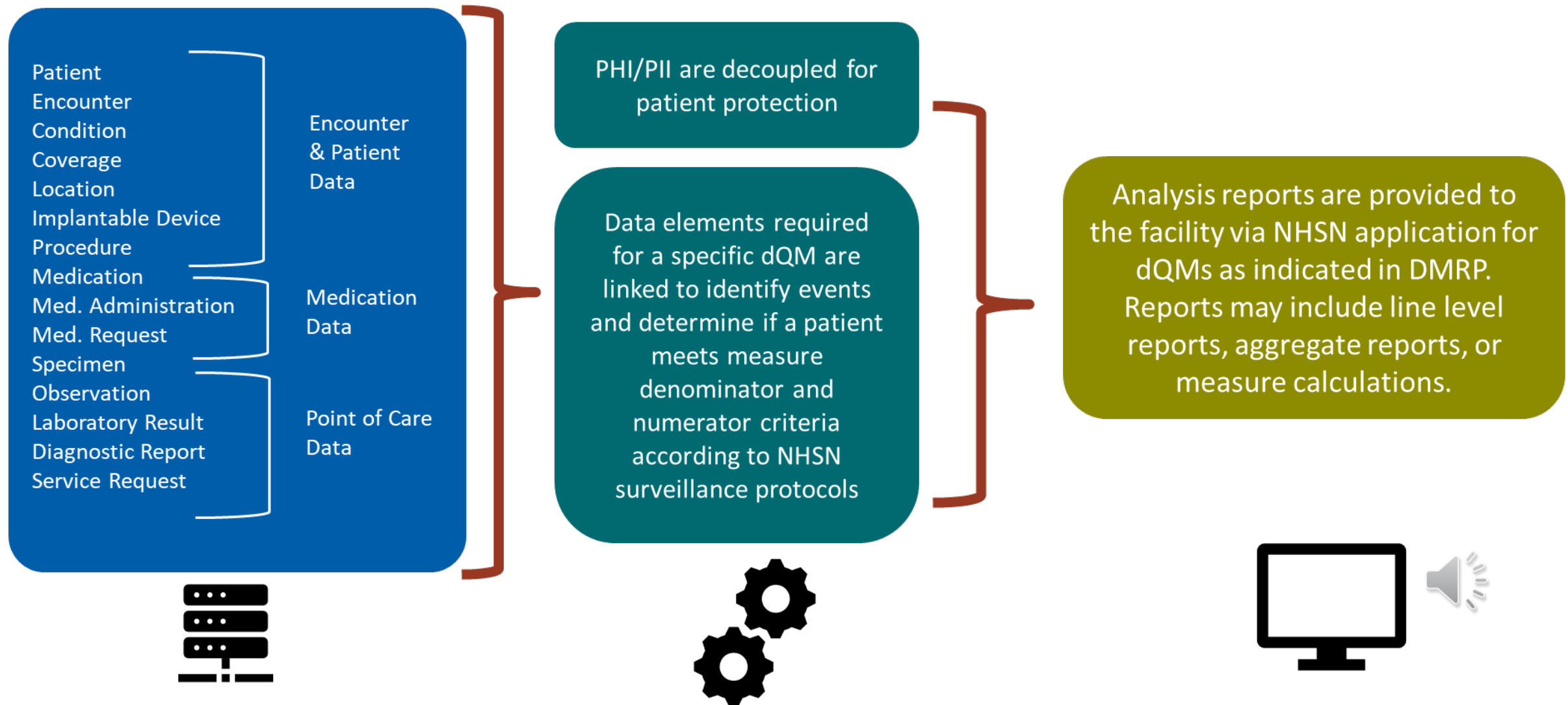
NHSN FHIR dQMs: Data Flow



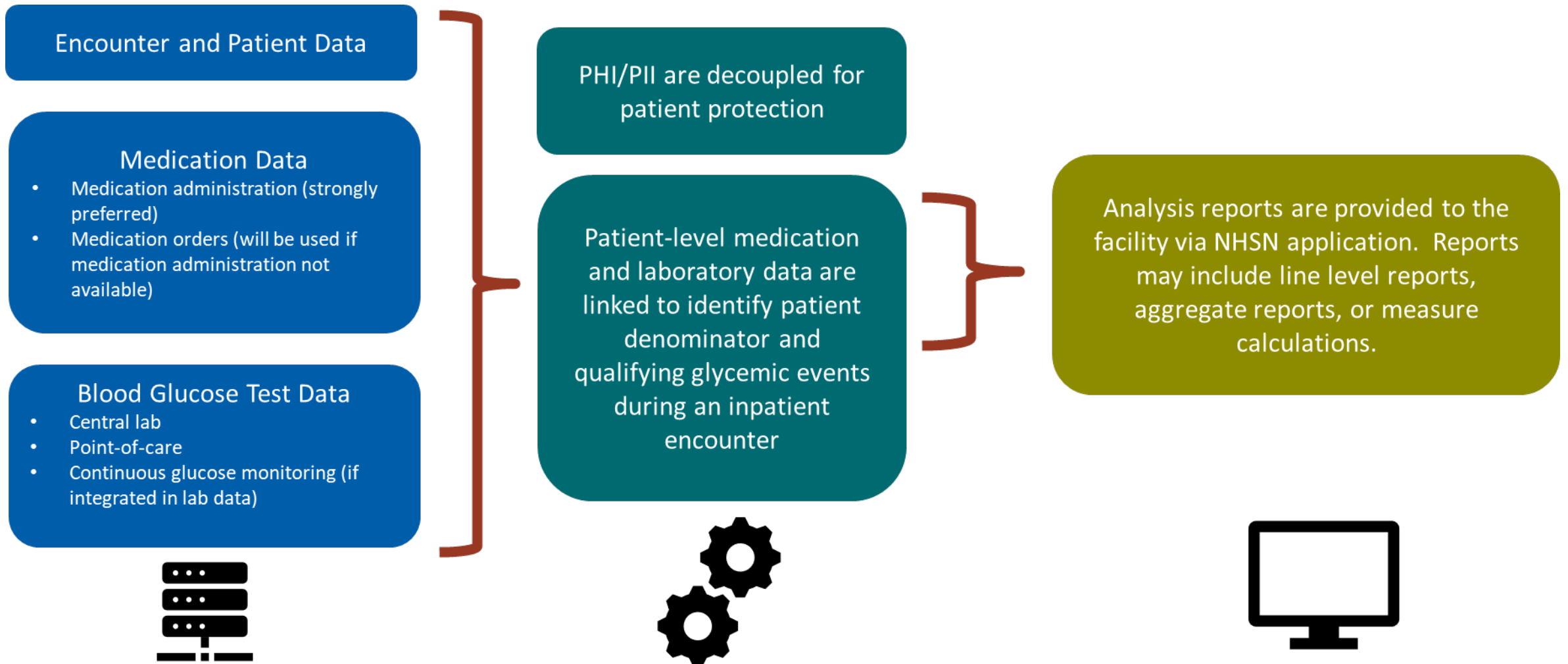
1. Confirm facility enrollment; request and receive NHSN FHIR dQM
2. Request and receive Patients of Interest, then query for required data
3. Evaluate and filter data using dQM criteria
4. Submit data for patients meeting dQM definition
5. NHSN ingests and analyzes submission and makes reports available via secure NHSN user interface



Event Determination for NHSN dQMs via FHIR



Event Determination for NHSN dQMs via FHIR – Glycemic Control Example



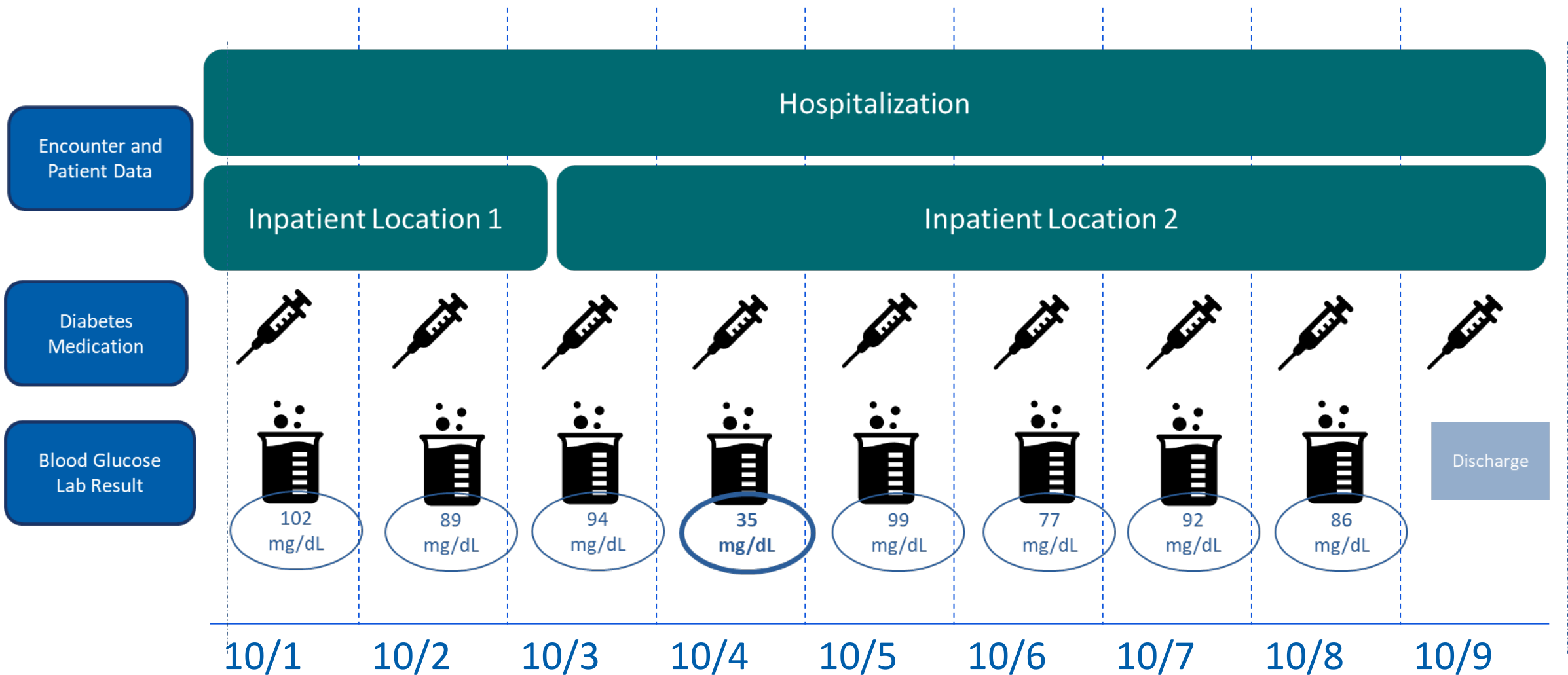
Event Determination for NHSN dQMs via FHIR – Glycemic Control Example

Measure	Numerator	Denominator
Primary Metric: Aligned with Centers for Medicare & Medicaid Services (CMS) Reporting Requirements		
Metric 1a, Hospital Harm, Severe Hypoglycemia (NQF 3503e)	No. of (adult) inpatient encounters with blood glucose (BG) <40 mg/dL preceded by diabetes medication (24 hours prior)*	No. of (adult) inpatient encounters with ≥1 diabetes medication administered**
Complementary Metrics: For Quality Improvement Dashboards		
Metric 2, Hypoglycemia Event Days	A “hypoglycemia day” is an inpatient day (for patients of all ages) with at least one documented hypoglycemia event The metric will be evaluated at the following BG thresholds: <40 mg/dL, 40-53 mg/dL, and 54-69 mg/dL	
Metric 3, Recurrent Hypoglycemia Event Days	A “recurrent hypoglycemia day” is a diabetes medication day with at least one documented hypoglycemia event that is preceded by another inpatient day within a 24-hour period. The metric will be evaluated at the following BG thresholds: <40 mg/dL, 40-53 mg/dL, and 54-69 mg/dL	
Metric 4, Severe Hypoglycemia Resolution	Median time between hypoglycemia event <40 mg/dL and first BG ≥70 mg/dL thereafter (for patients of all ages)	

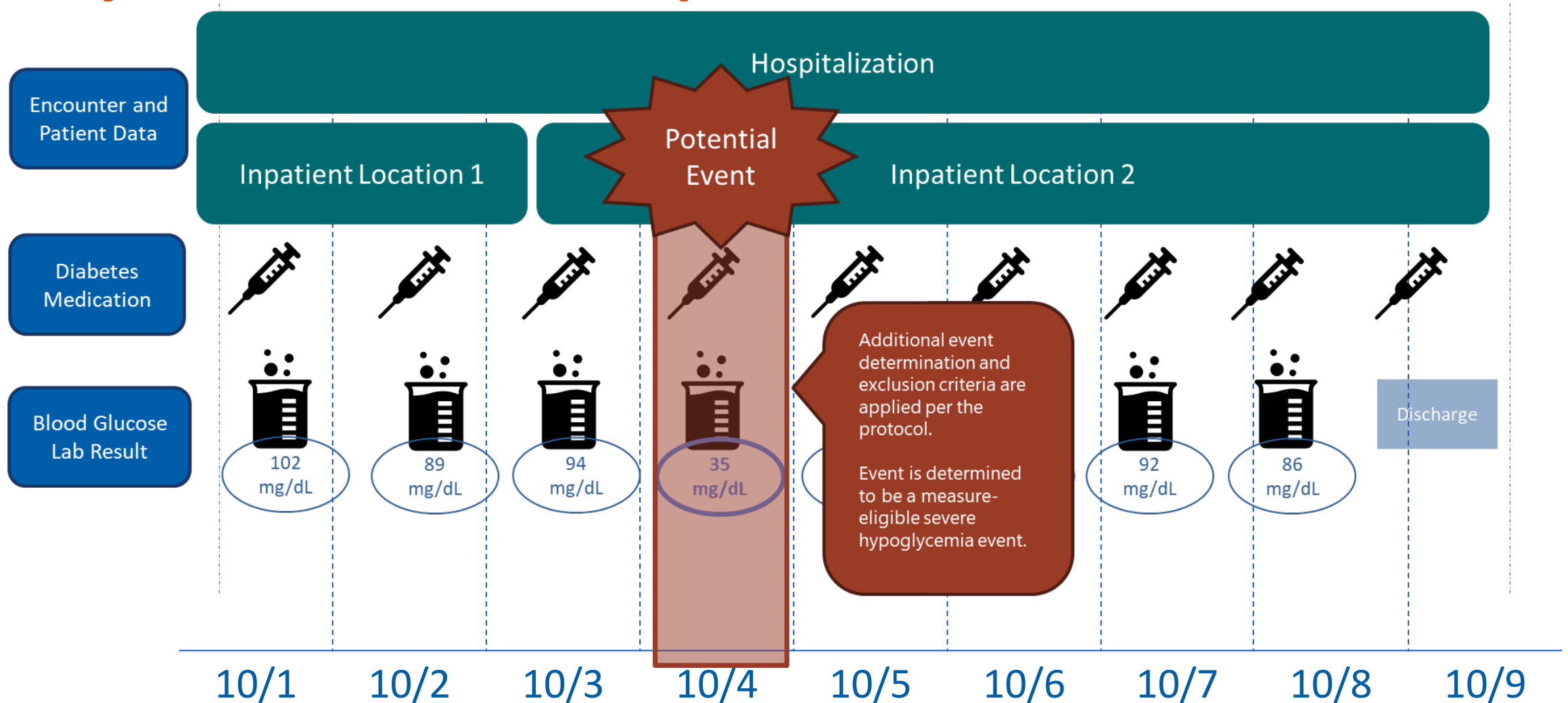
*And no subsequent repeat test for BG with a result >80 mg/dL within five minutes of the start of the initial low BG test.

**Includes instances of administration of diabetes medications in the emergency department or in observation status that end within one hour of the inpatient admission.

Event Determination for NHSN dQMs via FHIR – Glycemic Control Example



Event Determination for NHSN dQMs via FHIR – Glycemic Control Example



Event Determination for NHSN dQMs – Glycemic Control Example

National healthcare Safety Network

Line Listing for Severe Hypoglycemia Encounters, Adult (with Medication Request)

As of: November 30, 2023 at 2:22pm

Date Range: All

NHSN Org ID	Patient ID	Encounter ID	Admission Date	Discharge Date	Event Type	Event Severity Level	Blood Glucose Level	Diabetes Medication
10000	aabbcc	xyyyzz	10/01/2023	10/09/2023	Hypoglycemia	Severe	35	Insulin glargine
10000	ddeeff	qqrss	10/14/2023	10/19/2023	Hypoglycemia	Severe	39	Regular Insulin
10000	gghhii	llmmnn	10/21/2023	10/29/2023	Hypoglycemia	Severe	31	Insulin aspart

NHSN Digital Quality Measures: Analysis Reports

NHSN dQM Analysis Reports: *What will be available?*

- Analysis reports will be available in the NHSN application as new NHSN dQMs are implemented
- Analysis reports will include metric calculations for a facility, as well as selected supplemental reports (e.g., line-level listing of events by location)
- Additional analysis reports (e.g., user group reports) will be phased in



NHSN dQM Analysis Reports: *Who will be able to access?*

- Accessible by registered NHSN users
- Access determined by individual and group user rights (similar to current modules)
- As an experienced NHSN user, you can:
 - Identify new NHSN users who need access to analysis reports
 - Assist with adding new NHSN users
 - Educate colleagues on
 - navigating the NHSN application
 - accessing analysis reports
 - understanding and modifying dQM analysis reports

NHSN dQM Analysis Reports: *Where* will they be available?

- In the “Analysis” section of the corresponding NHSN component in the NHSN application

The screenshot displays the NHSN application interface. At the top left is the CDC logo with the text "Centers for Disease Control and Prevention" and "CDC 24/7: Saving Lives, Protecting People™". At the top right is the NHSN logo with the text "NATIONAL HEALTHCARE SAFETY NETWORK". Below the logos is a dark blue header bar with the text "NHSN - National Healthcare Safety Network" and a user profile icon. On the left side, there is a navigation menu with the following items: NHSN Home, Alerts, Dashboard, Reporting Plan, Patient, Event, Procedure, Summary Data, COVID-19, Import/Export, Surveys, Analysis, Users, and Facility. The "Analysis" item is highlighted in blue. In the main content area, the "Analysis Reports" section is visible, featuring a search bar and two buttons: "Expand All" and "Collapse All". Below these buttons is a list of report categories, each with a folder icon: HAI Risk Adjusted Measure Reports (SIRs, SURs), HAI Detailed Reports (Line Lists, Rate Tables, etc.), HAI Digital Measures (highlighted with a green box), CMS Reports, Targeted Assessment for Prevention (TAP) Reports, Antimicrobial Use and Resistance Module, COVID-19 Module, Nursing Hours Per Patient Day (NHPPD), Supplemental Reports, My Custom Reports, and Published Reports. A dropdown menu is open under the "Analysis" menu item, showing the following options: Generate Data Sets, Reports, and Statistics Calculator.

NHSN Digital Quality Measures: Dashboards (Under Development)

- Dashboards are planned for visualization of event data and select metrics
- Dashboards for dQMs may include visual and interactive depiction of:
 - Aggregated number of events
 - Events over time
 - Calculated metrics over time
- Once developed, dashboards will be accessible via the NHSN application

Summary

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During this presentation, we have reviewed:

- How data reported using NHSN dQMs is processed and analyzed by NHSN
- Why a Digital Measure Reporting Plan (DMRP) is important for dQM data analysis reports
- How and where facilities will be able to view data analysis reports for NHSN dQMs once available

For more information...

Please consider attending the following NHSN Annual Training session for more information about NHSN Digital Quality Measures (dQMs).

*Introducing NHSN's New Digital
Quality Measures
(Hypoglycemia, HT-CDI, HOB, RPS)*

Monday, March 18, 2024

For any questions or concerns, contact the NHSN Helpdesk using

NHSN-ServiceNow to submit questions to the NHSN Help Desk.

The new portal can be accessed at <https://servicedesk.cdc.gov/nhsncsp>.

Users will be authenticated using CDC's Secure Access Management Services (SAMS) the same way you access NHSN. If you do not have a SAMS login, or are unable to access ServiceNow, you can still email the NHSN Help Desk at nhsn@cdc.gov.

For more information, please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333

Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: cdcinfo@cdc.gov Web: 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.

