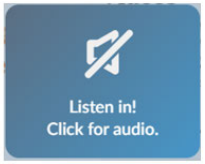
Pioneers in Quality
Expert to Expert Webinar Series

2023 Annual Updates for 2024 Reporting Year
HH-Hyper (CMS871v3) Severe Hyperglycemia
HH-Hypo (CMS816v3) Severe Hypoglycemia

December 7, 2023

Webinar Audio – Information & Tips



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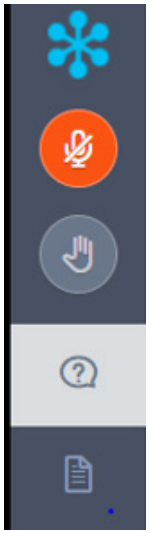

Welcome!

But first things first…

"Get Started with eCQMs"

Slides are available now!

To access the slides:

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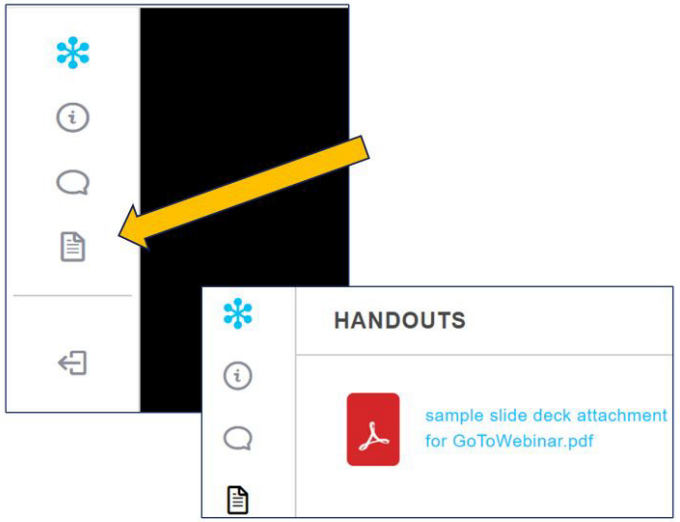

Slides will also be available here within a couple weeks:
https://www.jointcommission.org/measurement/pioneers-in-quality/pioneers-in-quality-expert-to-expert-series/

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Learning Objectives:

- Navigate to the measure specifications, value sets, measure flow diagrams and technical release notes
- Apply concepts learned about the logic and intent for the Severe Hyperglycemia and Hypoglycemia eCQMs
- Prepare to implement the Severe Hyperglycemia and Hypoglycemia eCQMs for the 2024 eCQM reporting period
- Identify common issues and questions regarding the Severe Hyperglycemia and Hypoglycemia eCQMs

Topics Not Covered in Today's Webinar

- Basic eCQM concepts
- Topics related to chart abstracted measures
- Process improvement efforts related to this measure
- eCQM validation

Disclosure Statement

These staff and speakers have disclosed that they do not have any conflicts of interest. For example, financial arrangements, affiliations with, or ownership of organizations that provide grants, consultancies, honoraria, travel, or other benefits that would impact the presentation of today's webinar content.

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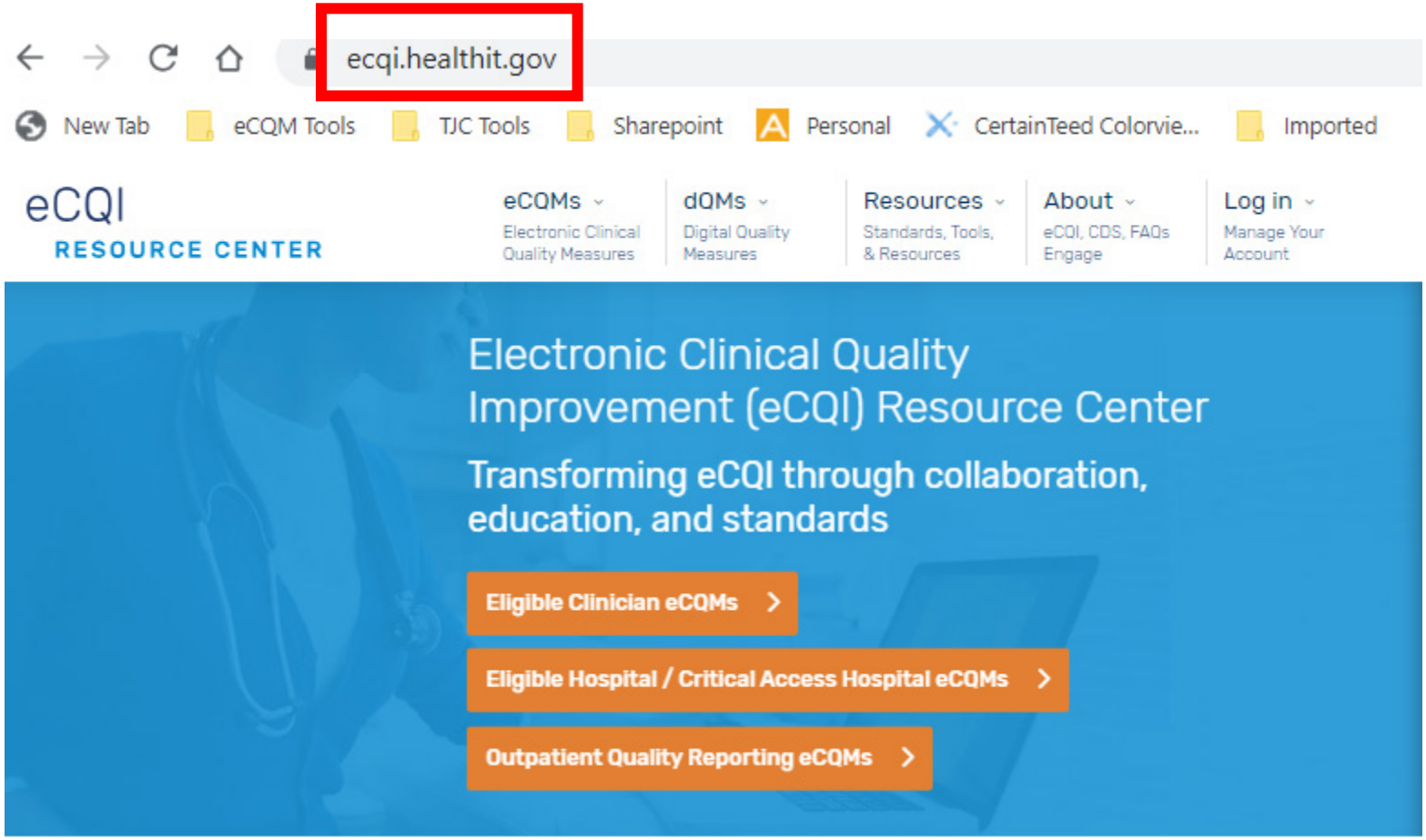
Pioneers in Quality Expert to Expert Webinar Agenda: Glycemia eCQMs

- Demonstrate eCQI Resource Center navigation to measure specifications, value sets, measure flow diagrams and technical release notes
- Review the measure flow/algorithm
- Review changes made to Severe Hyperglycemia and Hypoglycemia eCQMs
- Review FAQs
- Facilitated Audience Q&A Segment

eCQI Resource Center Website Demo



HH-Hyper Severe Hyperglycemia
HH-Hypo Severe Hypoglycemia

HH-Hyper, HH-Hypo: Adopted Into CMS Program

- In fiscal year (FY) 2022 CMS finalized the addition of HH-Hypo and HH-Hyper to the Hospital IQR Program measure set, beginning with the CY 2023 reporting period/FY 2025 payment determination.
- Organizations can self-select for voluntary reporting the measure(s) to CMS for calendar year (CY) 2023 reporting period/FY 2025 payment determination.

Measure Changes to both HH-Hyper and HH-Hypo from 2023 to 2024

Measure Components	2023 Reporting Year	2024 Reporting Year
Initial Population	Age 18 and older at start of the Global.HospitalizationWithObservation	Age 18 and older at the start of the inpatient hospitalization
Guidance	The specimen source for the glucose test is blood, serum,or plasma, and can be obtained by a laboratory test, or a Point of Care (POC) test	The specimen source for the glucose test is blood, serum, plasma, or interstitial fluid, and can be obtained by a laboratory test, a Point of Care (POC) test, or a continuous glucose monitor (CGM)
Multiple definitions	The timing associated with Laboratory Test, Performed data elements uses Global.'NormalizeInterval'	Revised the timing associated with Laboratory Test, Performed data elements to use Global.'EarliestOf'
Value Set	NA	Multiple value sets with code additions/deletions due to terminology updates or based on review by technical experts, SMEs, and/or public feedback. See value sets for more details.

HH-Hyper Severe Hyperglycemia

HH-Hyper - Rationale

Measure Description:

This measure assesses the number of inpatient hospital days for patients age 18 and older with a hyperglycemic event (harm) per the total qualifying inpatient hospital days for that encounter

Rationale/Intent

- Assesses occurrence and extent of severe hyperglycemia; not overall glucose control
- Intended to be used in combination with its companion measure Severe Hypoglycemia to reduce unintended consequences.
- Patients with glucose of >200mg/dL are at high risk
- Associated with increased in-hospital mortality, infection rates, and hospital LOS (length of stay)
- Lowering rate improves patient care while reducing costs
- Rates of inpatient severe hyperglycemia events indicate quality of care
- Preventable with proper glycemic management

HH-Hyper Measure Specifications

Description: The number of inpatient hospital days for patients age 18 and older with a hyperglycemic event (harm) per the total qualifying inpatient hospital days for that encounter

Initial Population (IP) (Denominator = IP)	Denominator Exclusion	Numerator
Inpatient hospitalization	Inpatient hospitalization	Inpatient hospitalization
Age: >= 18 at the start of the ~~Global.HospitalizationWithObservation~~ inpatient hospitalization	Initial ~~blood~~ glucose with result of >=1000 mg/dL anytime between 1 hour prior to the start of the encounter to 6 hours after the start of the encounter	A hyperglycemic event within the first 10 days of the encounter minus the first 24 hours, and minus the last period before discharge from the hospital if less than 24 hours
- A diagnosis of diabetes that starts before or during the encounter; or - Administration of at least one dose of insulin or any hypoglycemic medication during the encounter; or - Presence of at least one ~~blood~~ glucose value >=200 mg/dL at any time during the encounter		A hyperglycemic event is defined as: - A day with at least one ~~blood~~ glucose value >300 mg/dL OR - A day where a ~~blood~~ glucose test and result was not found, and it was immediately preceded by two contiguous, consecutive days where at least one ~~blood~~ glucose value during each of the two days was >=200 mg/dL

HH-Hyper Measure Specifications (cont'd)

Description: The number of inpatient hospital days for patients age 18 and older with a hyperglycemic event (harm) per the total qualifying inpatient hospital days for that encounter

Measure Observation 1 (Denominator)	Measure Observation 2 (Numerator)
The total number of eligible days of the inpatient hospitalization which match the initial population/denominator criteria and did not meet the denominator exclusion criteria	The total number of hyperglycemic days during the inpatient hospitalization that meet the numerator criteria
	Days with a hyperglycemic event are defined as: - All days with a ~~blood~~ glucose level >300 mg/dL (except those occurring in the first 24-hour period after admission to the hospital (including the emergency department and observation)), OR - All days where a ~~blood~~ glucose was not measured, and it was immediately preceded by two contiguous, consecutive days where at least one ~~blood~~ glucose value during each of the two days was >=200 mg/dL.

The length of stay for all eligible inpatient hospitalizations is truncated to <=10 days when the length exceeds 10 days. Do not count the last day if it was less than a 24-hour period as this is not considered a full day.

HH-Hyper Measure Changes from 2023 to 2024 - Technical

Measure Components	2023 Reporting Year	2024 Reporting Year
Definition: Measure Observation 1 (Denominator)	Sum (singleton from ("Days With Hyperglycemic Events" EncounterWithEventDays where EncounterWithEventDays.encounter = QualifyingEncounter return Count(EncounterWithEventDays.eligibleEventDays)))	Sum (if QualifyingEncounter.id in "Denominator Exclusions".id then singleton from ("Days with Hyperglycemic Events" EncounterWithEventDays where EncounterWithEventDays.encounter = QualifyingEncounter return 0) else singleton from ("Days with Hyperglycemic Events" EncounterWithEventDays where EncounterWithEventDays.encounter = QualifyingEncounter return Count(EncounterWithEventDays.eligibleEventDays)))

HH-Hyper Measure Changes from 2023 to 2024 – Technical (cont'd)

Measure Components	2023 Reporting Year	2024 Reporting Year
Definition: Measure Observation 2 (Numerator)	Sum (singleton from ("Days With Hyperglycemic Events" EncounterWithEventDays where EncounterWithEventDays.encounter = QualifyingEncounter return Count(EncounterWithEventDays.eligibleEventDays EligibleEventDay where EligibleEventDay.hasHyperglycemicEvent)))	Sum (if QualifyingEncounter.id in "Denominator Exclusions".id then singleton from ("Days with Hyperglycemic Events" EncounterWithEventDays where EncounterWithEventDays.encounter = QualifyingEncounter return 0) else singleton from ("Days with Hyperglycemic Events" EncounterWithEventDays where EncounterWithEventDays.encounter = QualifyingEncounter return Count(EncounterWithEventDays.eligibleEventDays EligibleEventDay where EligibleEventDay.hasHyperglycemicEvent)))

HH-Hyper Measure Changes from 2023 to 2024 – Technical (cont'd)

Measure Components	2023 Reporting Year	2024 Reporting Year
Denominator Exclusion logic	Encounter With First Blood Glucose Greater Than or Equal to 1000	Revised to constrain the glucose test to the qualifying encounter

Measure Score: Proportion vs Ratio

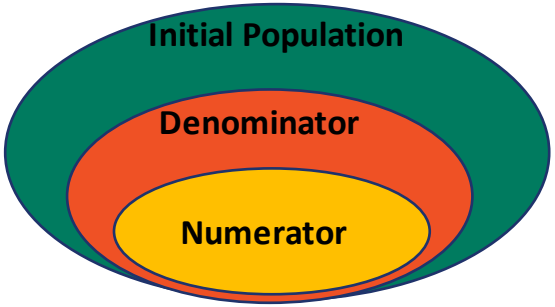
Proportion

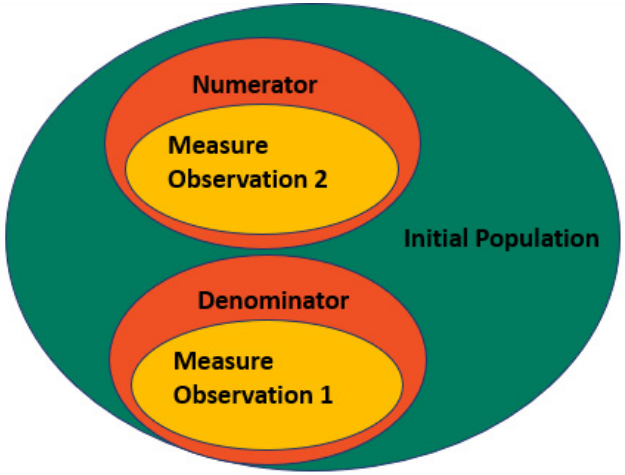
Numerator is a subset of Denominator

Example

Patient with stroke discharged with antithrombotic (Numerator)

Patients with stroke (Denominator)





Ratio

The top and bottom numbers of the ratio (the measure observations) come from 2 populations (the Numerator and Denominator)

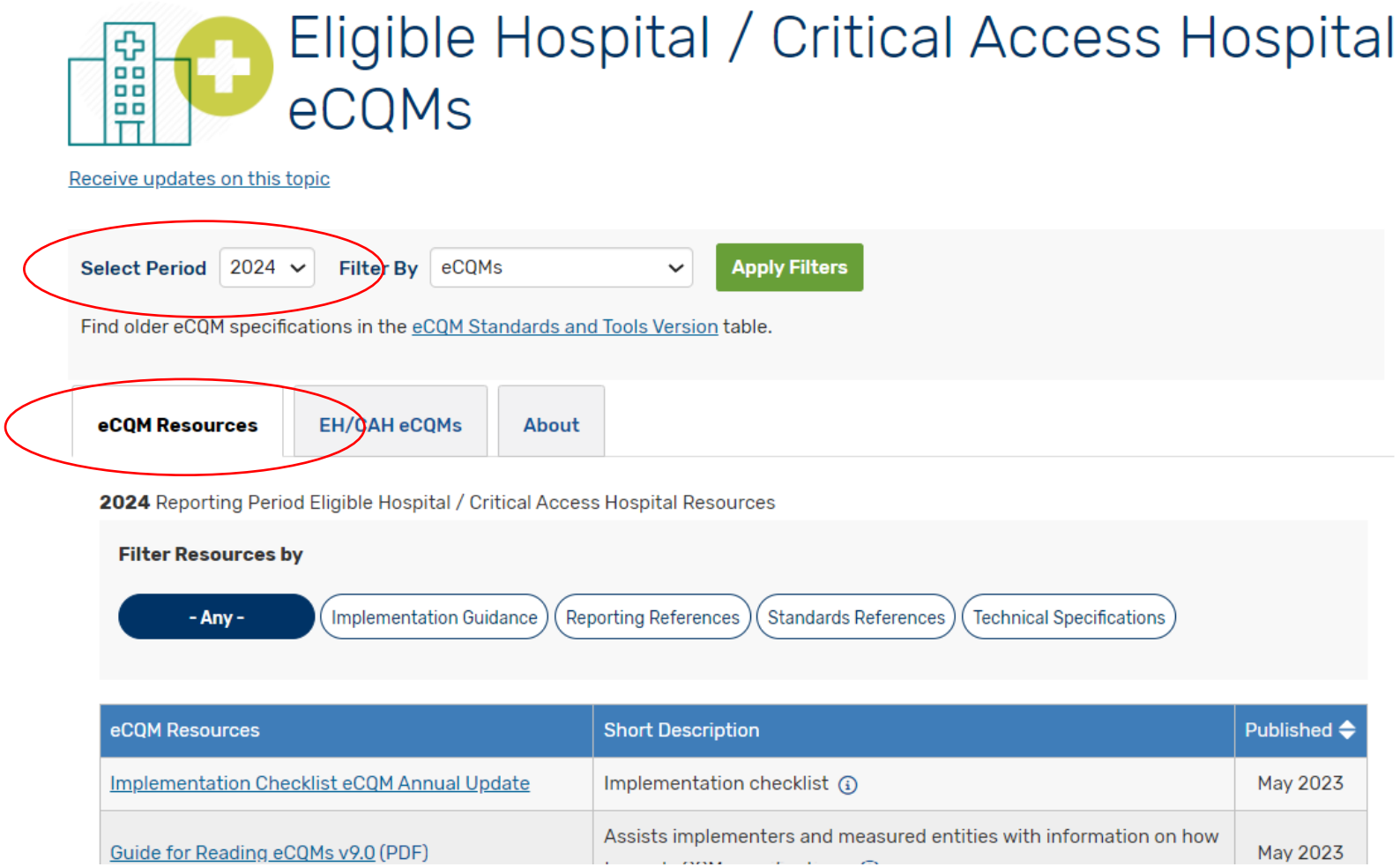
Example

Number of hyperglycemic event days (Measure Observation from Numerator)

Number of eligible days across all qualifying encounters (Measure Observation from Denominator)

Navigation to the Measure Flow Diagrams

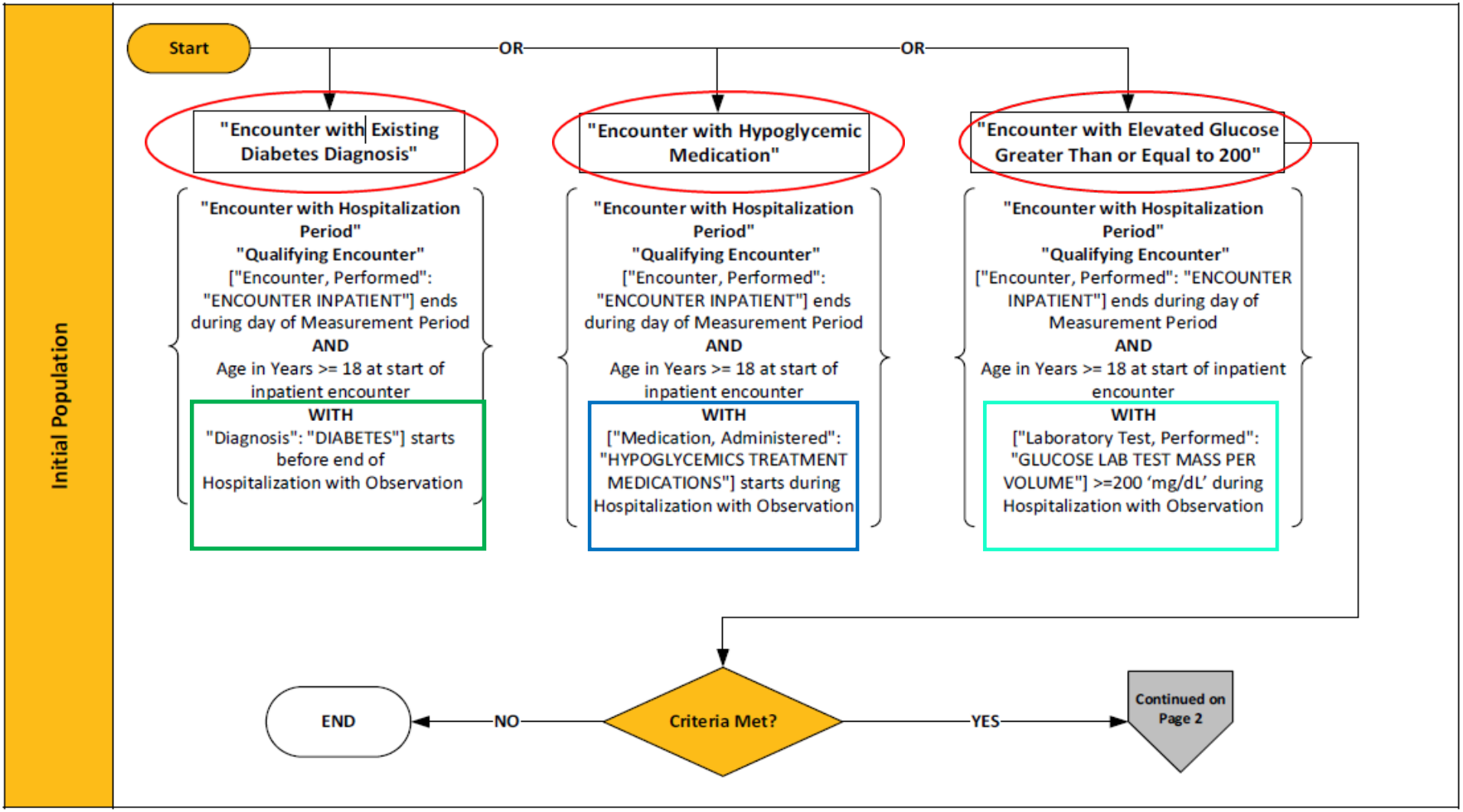
Navigation to the Measure Flow Diagrams
(continued)



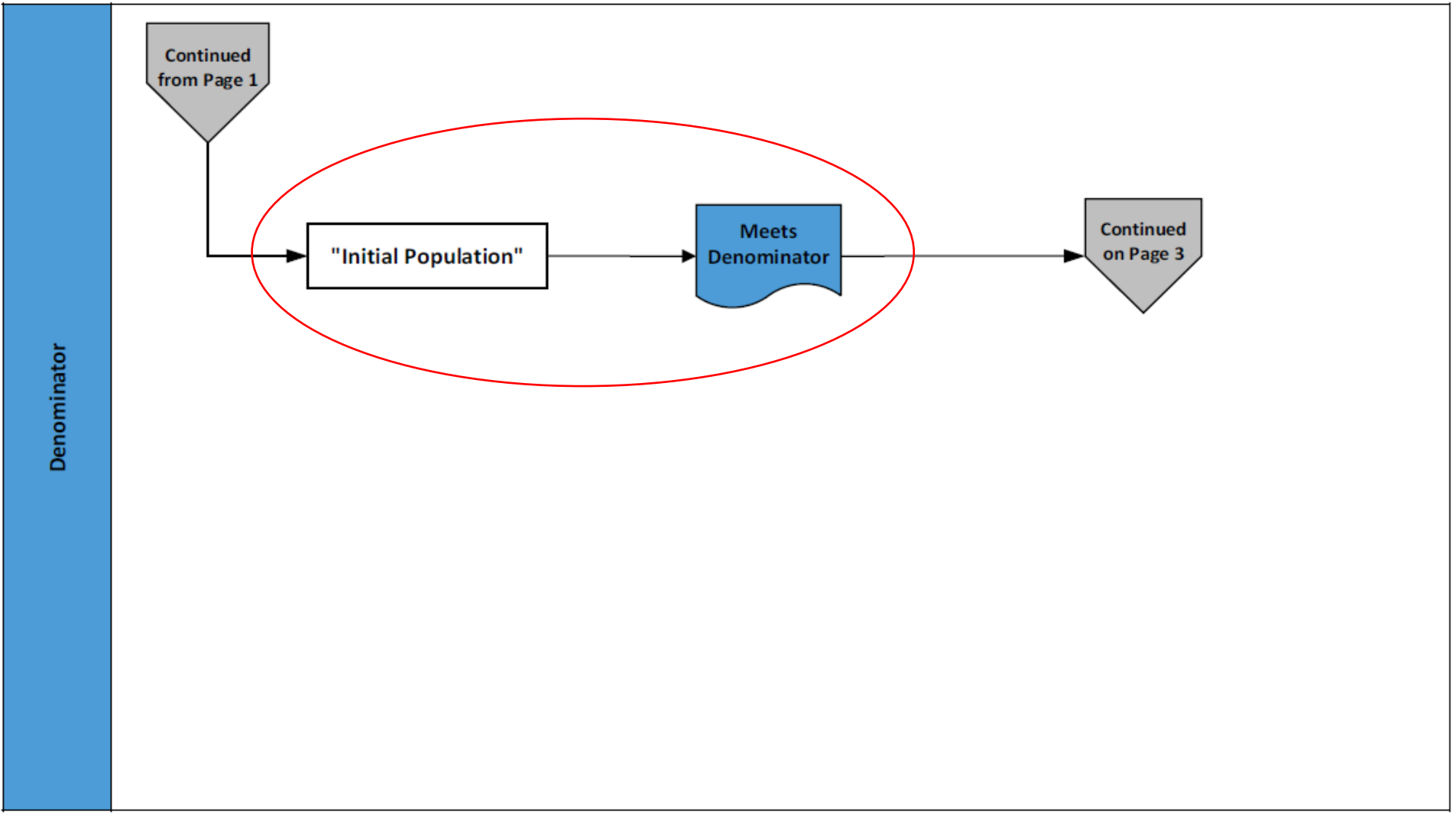
Navigation to the Measure Flow Diagrams
(continued)

eCQM Resources	Short Description	Published
Implementation Checklist eCQM Annual Update	Implementation checklist	May 2023
Guide for Reading eCQMs v9.0 (PDF)	Assists implementers and measured entities with information on how to read eCQM specifications	May 2023
Hospital Quality Reporting Table of eCQMs (PDF)	List of eCQMs available for use	May 2023
eCQM Specifications for Hospital Quality Reporting (ZIP)	eCQM technical specifications	May 2023
Measure Authoring Tool (MAT) Global Common Library (GCL) Technical Specifications (ZIP)	MAT-CGL specifications	May 2023
eCQM and Hybrid Measure Value Sets	Value sets used with eCQMs and Hybrid Measures	May 2023
eCQM Direct Reference Codes List	eCQM Direct Reference Codes used in eCQMs	May 2023
Binding Parameter Spe tion (BPS)	Value set metadata	May 2023
eCQM Logic and Im ntation Guidance v7.0 (PDF)	Assists implementers and measured entities with how to use eCQMs and report issues	May 2023
Standards and t rsions used for reporting/perf ce period	Tools and standards versions measure developers used to create eCQMs and versions of standards and tools used for their reporting	Mar 2023
Technical Re Notes (PDF)	Year over year changes to eCQMs, including logic and terminology	May 2023
Technic se Notes (ZIP)	Year over year changes to eCQMs, including logic and terminology	May 2023
eCQM Flows (ZIP)	Assists implementers and measured entities with steps to take to calculate an eCQM	Aug 2023

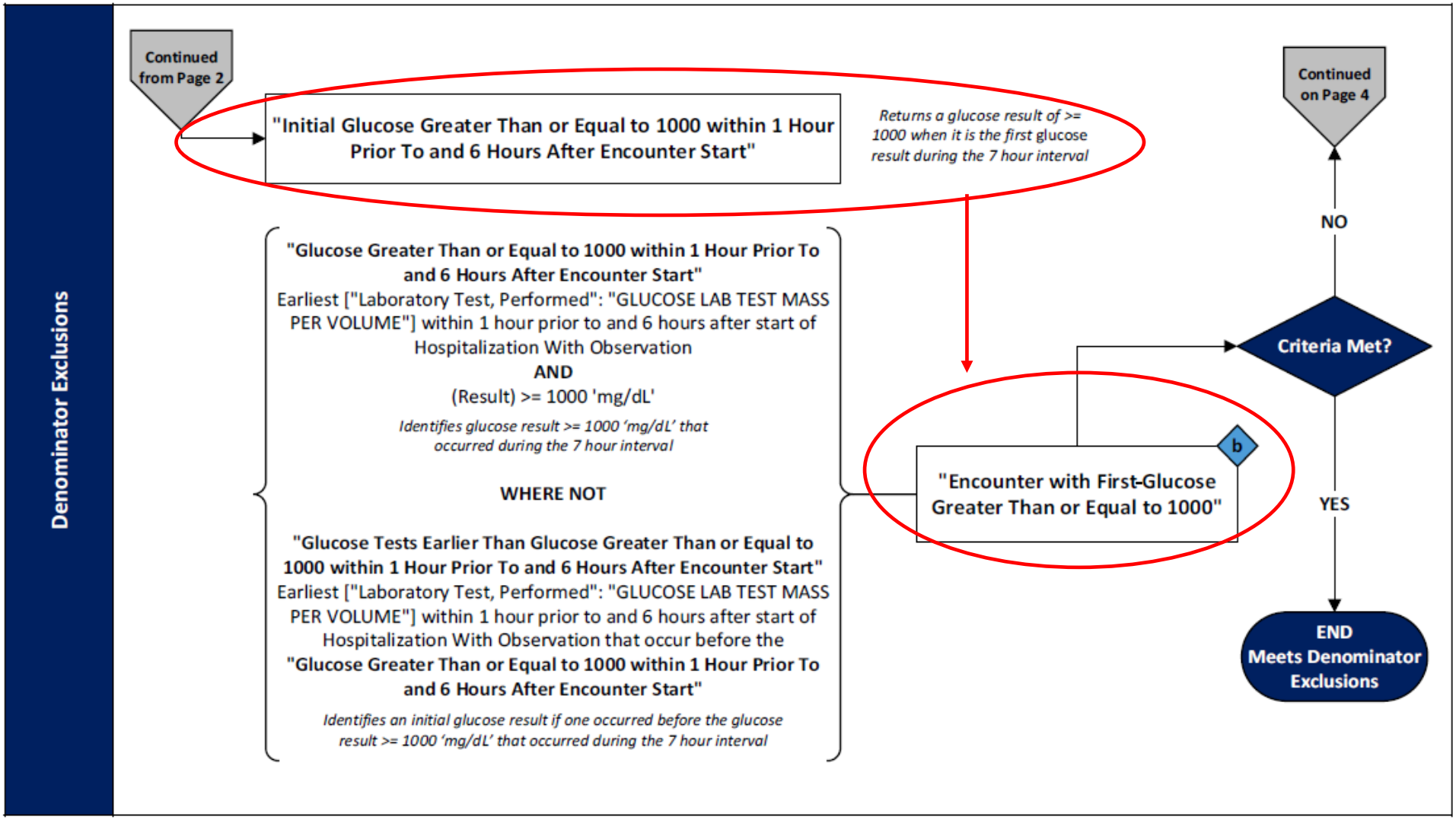
HH-Hyper Measure Flow Diagram



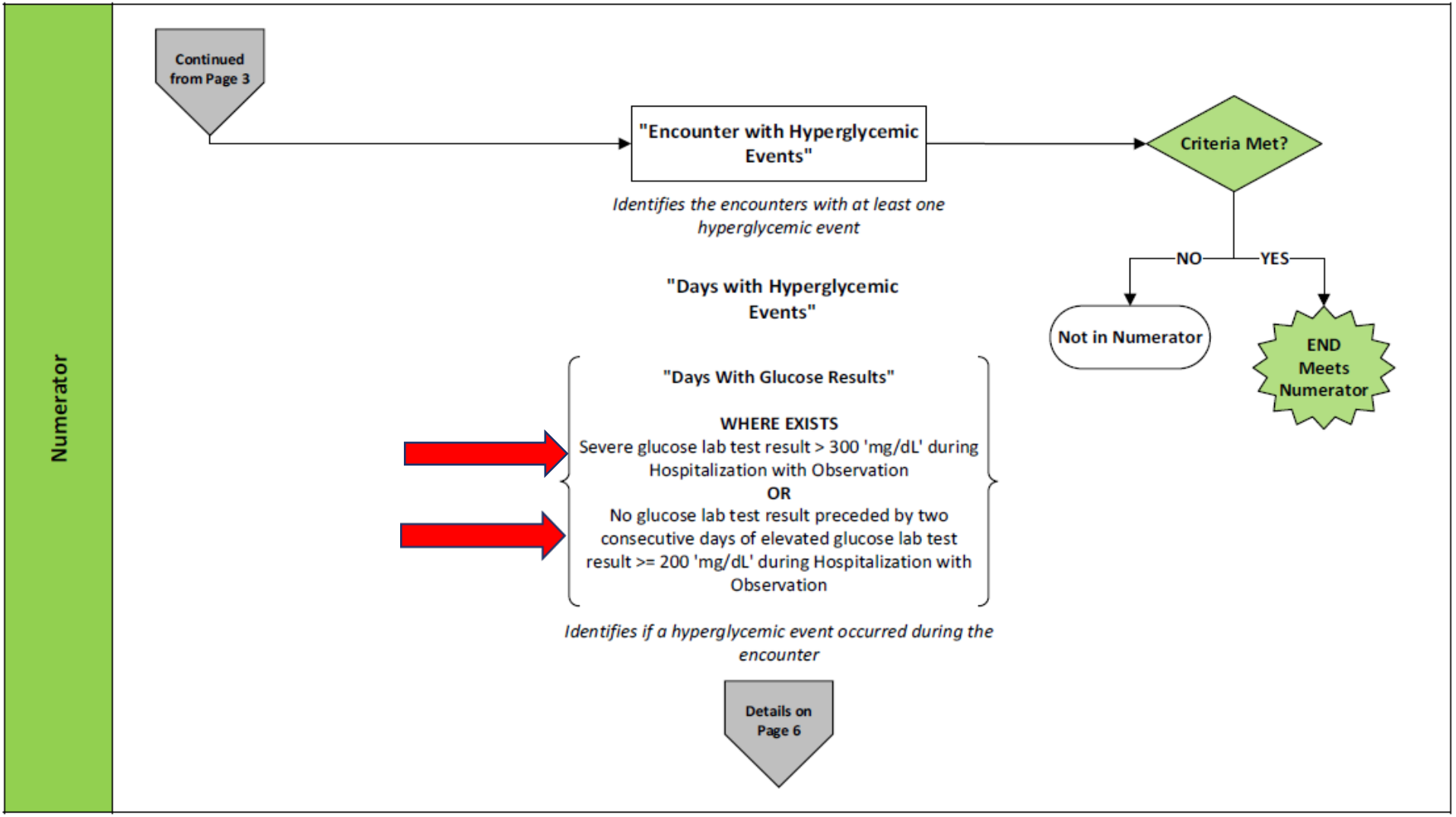
HH-Hyper Measure Flow Diagram (cont'd)



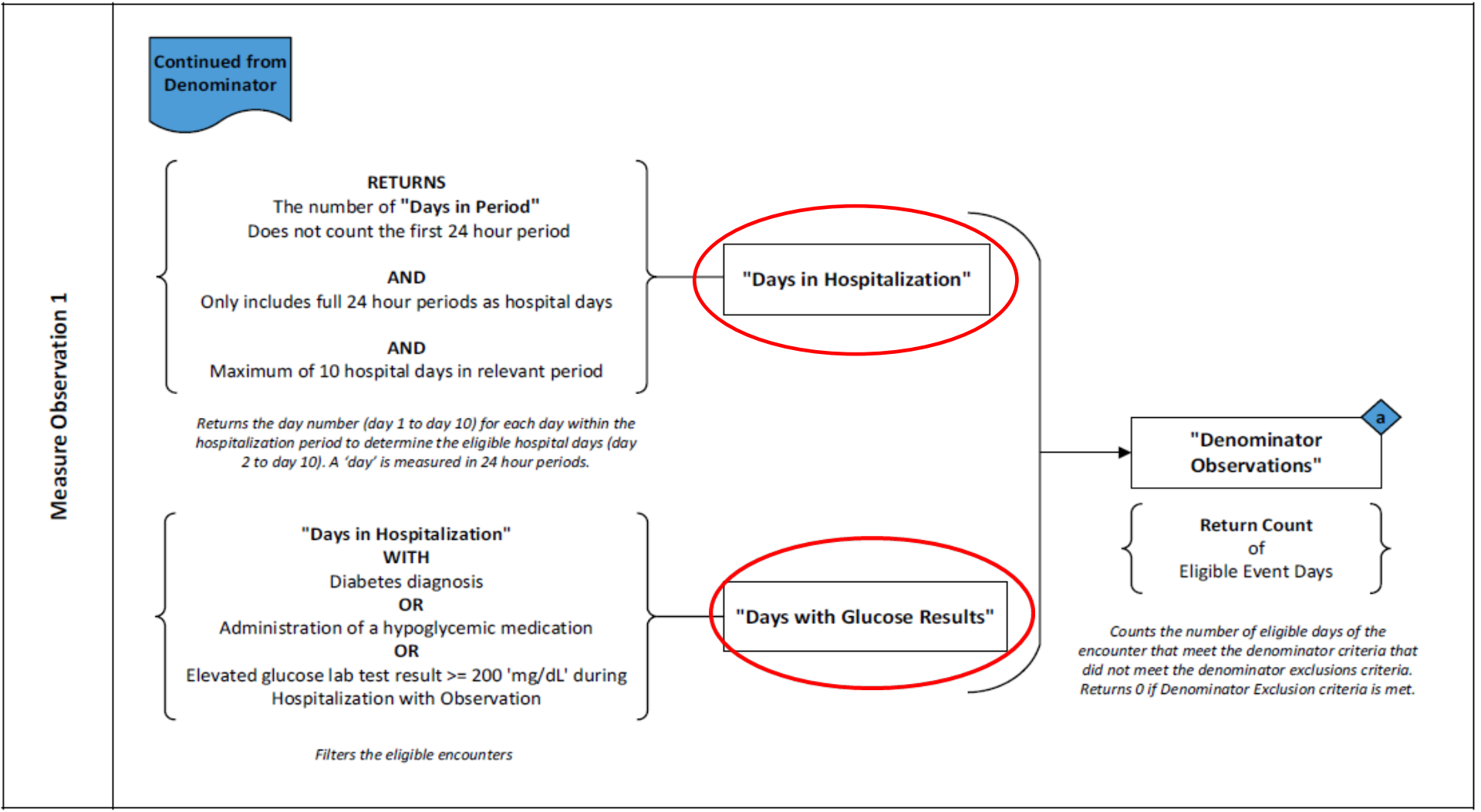
HH-Hyper Measure Flow Diagram (cont'd)



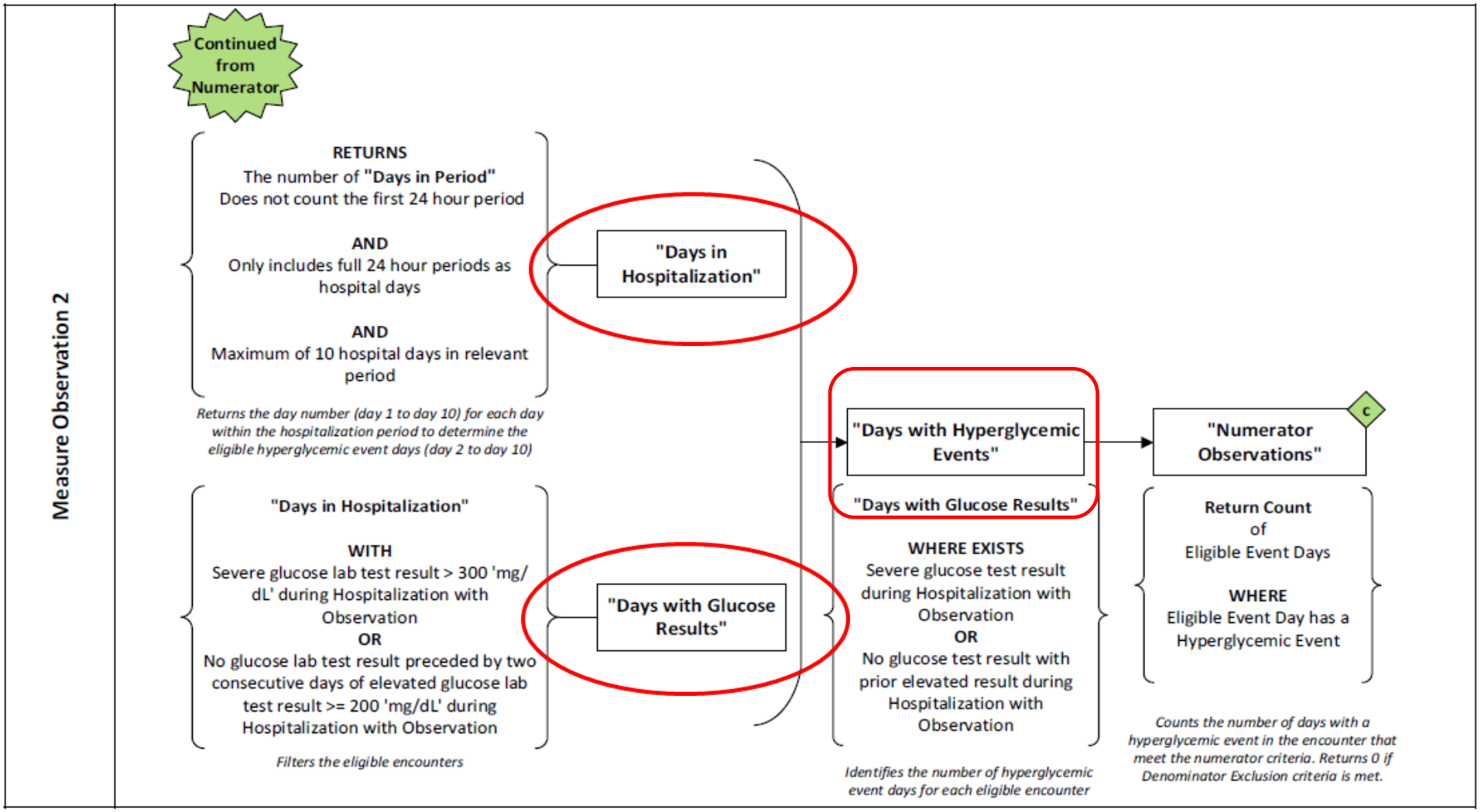
HH-Hyper Measure Flow Diagram (cont'd)



HH-Hyper Measure Flow Diagram (cont'd)



HH-Hyper Measure Flow Diagram (cont'd)



HH-Hyper Measure Flow Diagram (cont'd)

Sample Calculation

$$\text{Performance Rate} = \frac{\text{Measure Observations 2 associated with the Numerator (c = 100)}}{\text{Measure Observations 1 associated with the Denominator (a = 550) – Denominator Exclusions (b = 50)}} = 20\%$$

HH-Hyper Initial Population

Inpatient hospitalizations for patients age 18 and older with either:

- A diagnosis of diabetes that starts before or during the encounter

Initial Population: "Encounter with Existing Diabetes Diagnosis"

Population Definition

Encounter with Existing Diabetes Diagnosis

```
"Encounter with Hospitalization Period" Hospitalization
  with ["Diagnosis": "Diabetes"] DiabetesCondition
    such that DiabetesCondition.prevalencePeriod starts before end of Hospitalization.hospitalizationPeriod
    return Hospitalization.encounter
```

Encounter with Hospitalization Period

```
"Qualifying Encounter" QualifyingHospitalization
    return Tuple { encounter: QualifyingHospitalization,
                   hospitalizationPeriod: Global."HospitalizationWithObservation" ( QualifyingHospitalization ) }
```

Qualifying Encounter

```
["Encounter, Performed": "Encounter Inpatient"] InpatientEncounter
    where InpatientEncounter.relevantPeriod ends during day of "Measurement Period"
  and AgeInYearsAt (date from start of InpatientEncounter.relevantPeriod ) >= 18
```

HH-Hyper Initial Population (cont'd)

Inpatient hospitalizations for patients age 18 and older with either:

- Administration of at least one dose of insulin or hypoglycemic medication during the encounter

Initial Population: "Encounter with Hypoglycemic Medication"

Encounter with Hypoglycemic Medication

"Encounter with Hospitalization Period" Hospitalization
with ["Medication, Administered": "Hypoglycemics Treatment Medications"] HypoglycemicMedication
such that Global."NormalizeInterval" (HypoglycemicMedication.relevantDatetime, HypoglycemicMedication.relevantPeriod)
starts during Hospitalization.hospitalizationPeriod
return Hospitalization.encounter"

HH-Hyper Initial Population (cont'd)

Inpatient hospitalizations for patients age 18 and older with either:

- Presence of at least one ~~blood~~ glucose value >= 200 mg/dL during the encounter

Initial Population: "Encounter with Elevated Glucose Greater Than or Equal to 200"

Encounter with Elevated ~~Blood~~ Glucose Greater Than or Equal to 200

"Encounter with Hospitalization Period" Hospitalization
with ["Laboratory Test, Performed": "Glucose Lab Test Mass Per Volume"] GlucoseTest
such that **Global."EarliestOf"** (GlucoseTest.relevantDatetime, GlucoseTest.relevantPeriod) during Hospitalization.hospitalizationPeriod
and GlucoseTest.result >= 200 'mg/dL'
return Hospitalization.encounter

HH-Hyper Denominator

Denominator: "Initial Population"

HH-Hyper Denominator Exclusion

Inpatient hospitalizations for patients with an initial ~~blood~~ glucose result of >=1000 mg/dL anytime between 1 hour prior to the start of the encounter to 6 hours after the start of the encounter

Denominator Exclusion: "Encounter with First Glucose Greater Than or Equal to 1000"

"Encounter with First ~~Blood~~ Glucose Greater Than or Equal to 1000"

```
  "Initial Population" InpatientHospitalization
  with "Initial Glucose Greater Than or Equal to 1000 within 1 Hour Prior To and 6 Hours After Encounter Start" FirstGlucoseResult
    such that FirstGlucoseResult.result is not null
      and FirstGlucoseResult.result >= 1000 'mg/dL'
      and Global."EarliestOf" ( FirstGlucoseResult.relevantDatetime, FirstGlucoseResult.relevantPeriod ) during Interval[( start of
Global."HospitalizationWithObservation" ( InpatientHospitalization ) - 1 hour ), ( start of Global."HospitalizationWithObservation" (
InpatientHospitalization ) + 6 hours )]
  return InpatientHospitalization
```

"Initial Glucose Greater Than or Equal to 1000 within 1 Hour Prior To and 6 Hours After Encounter Start"

```
    "Glucose Greater Than or Equal to 1000 within 1 Hour Prior To and 6 Hours After Encounter Start"
GlucoseResult1000
     where not ( GlucoseResult1000.id in
    "Glucose Tests Earlier Than Glucose Greater Than or Equal to 1000 within 1 Hour Prior To and 6 Hours After
Encounter Start".id )
```

HH-Hyper Denominator Exclusion (cont'd)

"Initial Glucose Greater Than or Equal to 1000 within 1 Hour Prior To and 6 Hours After Encounter Start"

"Glucose Greater Than or Equal to 1000 within 1 Hour Prior To and 6 Hours After Encounter Start" GlucoseResult1000
where not (GlucoseResult1000.id in
"Glucose Tests Earlier Than Glucose Greater Than or Equal to 1000 within 1 Hour Prior To and 6 Hours After Encounter Start".id)

HH-Hyper Denominator Exclusion – Example 1

Inpatient hospitalizations for patients with an initial glucose result of >=1000 mg/dL anytime between 1 hour prior to the start of the encounter to 6 hours after the start of the encounter

Pt has diabetes diagnosis								
Encounter start 7/20/23 @ 9:00am								
	7-Hour Window - 1 hr prior to the start of the encounter to 6 hrs after the start of the encounter:							Meets exclusion because Glucose test 1 is: - The initial test w/result - Within the 7-hour window - Has a result >=1000
	8:00am <----------7/20/23----------> 3:00pm							
Glucose test 1	8:00am 1000 mg/dL							
Glucose test 2		9:00am 900 mg/dL						
Glucose test 3							2:00pm 301 mg/dL	

HH-Hyper Denominator Exclusion – Example 2

Inpatient hospitalizations for patients with an initial glucose result of >=1000 mg/dL anytime between 1 hour prior to the start of the encounter to 6 hours after the start of the encounter

	Pt has diabetes diagnosis								
	Encounter start 7/20/23 @ 9:00am								
		7-Hour Window - 1 hr prior to the start of the encounter to 6 hrs after the start of the encounter:							Does not meet exclusion because: - Although Glucose test 1 is >=1000 mg/dL, it is not within the 7-hour window; it is 1 minute before. - Although Glucose test 2 is the "initial" glucose test w/result within the window, it is not >=1000 md/dL.
		8:00am <----------7/20/23----------> 3:00pm							
Glucose test 1	7:59am 1000 mg/dL								
Glucose test 2			9:00am 900 mg/dL						
Glucose test 3								2:00pm 301 mg/dL	

HH-Hyper Denominator Exclusion – Example 3

Inpatient hospitalizations for patients with an initial glucose result of >=1000 mg/dL anytime between 1 hour prior to the start of the encounter to 6 hours after the start of the encounter

Pt has diabetes diagnosis								
Encounter start: 7/20/23 @ 9:00am								
	7-Hour Window - 1 hr prior to the start of the encounter to 6 hrs after the start of the encounter:							Does not meet exclusion because: - Glucose test 1 is the initial test w/result within the window but is not >=1000mg/dL. - Although Glucose test 2 is >=1000mg/dL, it is not the initial test w/result within the window.
	8:00am <----------7/20/23----------> 3:00pm							
Glucose test 1	8:00am 999 mg/dL							
Glucose test 2		9:00am 1000 mg/dL						
Glucose test 3						2:00pm 301 mg/dL		

HH-Hyper Denominator Exclusion – Example 4

Inpatient hospitalizations for patients with an initial glucose result of >=1000 mg/dL anytime between 1 hour prior to the start of the encounter to 6 hours after the start of the encounter

Encounter 1:									
Pt A has diabetes diagnosis									
Encounter start: 7/20/23 @		**9:00am**							Encounter end: 8/02/23 10:00am
	7-Hour Window - 1 hr prior to start of the encounter to 6 hrs after start of the encounter:								**Meets exclusion because:**
	8:00am <----------7/20/23----------\>3:00pm								**- Glucose test 1 is the initial test w/result within the window and is >=1000mg/dL.**
Glucose test 1								3:00pm 1001 mg/dL	
Encounter 2:									
Pt A has diabetes diagnosis									
Encounter start: 8/02/23 @		**11:00pm**							Encounter end: 8/05/23 8:00am
	7-Hour Window - 1 hr prior to start of the encounter to 6 hrs after start of the encounter:								**Does not meet exclusion because:**
	10:00pm <----------7/20/23----------\>5:00am								**- Glucose test 1 is initial test w/result within the window but is not >=1000mg/dL.**
Glucose test 1		11:00pm 900 mg/dL							**Glucose test 1 from Encounter 1 is not evaluated in Encounter 2.**

HH-Hyper Numerator

Inpatient hospitalizations with hyperglycemic event day(s) within the first 10 days of the encounter minus the first 24 hours, and minus the last period before discharge if less than 24 hours

A hyperglycemic event is defined as:
1. A day with at least one ~~blood~~ glucose value >300 mg/dL; OR
2. A day where a ~~blood~~ glucose test with result was not found, and it was immediately preceded by 2 contiguous, consecutive days where at least one ~~blood~~ glucose value during each of the two days was >=200 mg/dL.

Numerator: "Encounter with Hyperglycemic Events"

Encounter with Hyperglycemic Events

"Days with Hyperglycemic Events" HyperglycemicEventDays
where exists (HyperglycemicEventDays.eligibleEventDays EligibleEventDay
where EligibleEventDay.hasHyperglycemicEvent)
return HyperglycemicEventDays.encounter

HH-Hyper Numerator (cont'd)

Days With Hyperglycemic Events

```
"Days With Glucose Results" EncounterWithResultDays
  let eligibleEventDays: EncounterWithResultDays.relevantDays EncounterDay where EncounterDay.dayNumber > 1
    return Tuple { dayNumber: EncounterDay.dayNumber, dayPeriod: EncounterDay.dayPeriod, hasHyperglycemicEvent: (
  EncounterDay.hasSevereResult or (EncounterDay.hasNoGlucoseTest and EncounterWithResultDays.relevantDays[EncounterDay.dayNumber-
  2].hasElevatedResult and EncounterWithResultDays.relevantDays[EncounterDay.dayNumber - 3].hasElevatedResult ) ) }
    return Tuple { encounter: EncounterWithResultDays.encounter,
                   relevantPeriod: EncounterWithResultDays.relevantPeriod,
                   eligibleEventDays: eligibleEventDays }
```

Days With Glucose Results

```
"Days in Hospitalization" InpatientHospitalDays
  return Tuple {encounter: InpatientHospitalDays.encounter,
    relevantPeriod: InpatientHospitalDays.relevantPeriod,
    relevantDays: ( InpatientHospitalDays.relevantDays EncounterDay
      return Tuple {dayNumber: EncounterDay.dayNumber,
        dayPeriod: EncounterDay.dayPeriod,
        hasSevereResult: exists ( ["Laboratory Test, Performed": "Glucose Lab Test Mass Per Volume"] GlucoseTest
          where GlucoseTest.result > 300 'mg/dL'
            and Global."EarliestOf" ( GlucoseTest.relevantDatetime, GlucoseTest.relevantPeriod ) during EncounterDay.dayPeriod
        ), hasElevatedResult: exists ( ["Laboratory Test, Performed": "Glucose Lab Test Mass Per Volume"] GlucoseTest
          where GlucoseTest.result >= 200 'mg/dL'
            and Global."EarliestOf" ( GlucoseTest.relevantDatetime, GlucoseTest.relevantPeriod ) during EncounterDay.dayPeriod
        ), hasNoGlucoseTest: not exists ( ["Laboratory Test, Performed": "Glucose Lab Test Mass Per Volume"] GlucoseTest
          where Global."EarliestOf" ( GlucoseTest.relevantDatetime, GlucoseTest.relevantPeriod ) during EncounterDay.dayPeriod)})}
```

HH-Hyper Numerator (cont'd)

Days in Hospitalization

```
"Measurement Population" EligibleInpatientHospitalization
  let period: Global."HospitalizationWithObservation" ( EligibleInpatientHospitalization ), relevantPeriod: "Hospital Days Max 10"(period)
  return Tuple {encounter: EligibleInpatientHospitalization, hospitalizationPeriod: period, relevantPeriod: relevantPeriod, relevantDays: "Days In Period"(relevantPeriod) }
```

Hospital Days Max 10(Period Interval<DateTime>)

```
Interval[start of Period, Min({
  end of Period, start of Period + 10 days })]
```

Days In Period(Period Interval<DateTime>)

```
( "Interval To Day Numbers"(Period)) DayNumber
  let startPeriod: start of Period + ( 24 hours * ( DayNumber - 1 ) ),
      endPeriod: if ( hours between startPeriod and end of Period < 24 ) then startPeriod
    else start of Period + ( 24 hours * DayNumber )
  return Tuple { dayNumber: DayNumber, dayPeriod: Interval [startPeriod, endPeriod ) }
```

Interval To Day Numbers(Period Interval<DateTime>)

```
( expand { Interval[1, days between start of Period and
end of Period]} ) DayExpand
  return end of DayExpand
```

Encounter start: 7/20/22 9:00am
Encounter end: 8/02/22 10:00am

dayIndex	24-hour Intervals start & end
1	7/20 9:00am – 7/21 8:59am
2	7/21 9:00am – 7/22 8:59am
3	7/22 9:00am – 7/23 8:59am
4	7/23 9:00am – 7/24 8:59am
5	7/24 9:00am – 7/25 8:59am
6	7/25 9:00am – 7/26 8:59am
7	7/26 9:00am – 7/27 8:59am
8	7/27 9:00am – 7/28 8:59am
9	7/28 9:00am – 7/29 8:59am
10	7/29 9:00am – 7/30 8:59am

LOS crops at 10 days max

HH-Hyper Numerator (cont'd)

Hyperglycemic Events Criteria:

1. A day with at least one blood glucose value >300 mg/dL

Encounter start: 7/20/23 9:00am
Encounter end: 8/02/23 10:00am

dayNumber	24-hour Intervals start & end	Eligible Days for Measure Observations	Glucose Results	Hyperglycemic Event Days
1	7/20 9:00am – 7/21 8:59am	1st 24 hrs is not eligible	Glucose result = 320	
2	7/21 9:00am – 7/22 8:59am	Eligible day 1		
3	7/22 9:00am – 7/23 8:59am	Eligible day 2	**Glucose result = 310**	true
4	7/23 9:00am – 7/24 8:59am	Eligible day 3	Glucose result = 190	
5	7/24 9:00am – 7/25 8:59am	Eligible day 4		
6	7/25 9:00am – 7/26 8:59am	Eligible day 5	Glucose result = 201	
7	7/26 9:00am – 7/27 8:59am	Eligible day 6	Glucose result = 220	
8	7/27 9:00am – 7/28 8:59am	Eligible day 7	**No glucose result**	true
9	7/28 9:00am – 7/29 8:59am	Eligible day 8		
10	7/29 9:00am – 7/30 8:59am	Eligible day 9	Glucose result = 299	

LOS crops at 10 days max

Has Severe Result:
DayNumber 1

DayNumber 3

HH-Hyper Numerator (cont'd)

Hyperglycemic Events Criteria:

2. A day where a glucose test and result was not found, and it was immediately preceded by two contiguous, consecutive days where at least one glucose value during each of the two days was >=200 mg/dL

Encounter start: 7/20/23 9:00am
Encounter end: 8/02/23 10:00am

dayNumber	24-hour Intervals start & end	Eligible Days for Measure Observations	Glucose Results	Hyperglycemic Event Days
1	7/20 9:00am – 7/21 8:59am	1st 24 hrs is not eligible	Glucose result = 320	
2	7/21 9:00am – 7/22 8:59am	Eligible day 1		
3	7/22 9:00am – 7/23 8:59am	Eligible day 2	**Glucose result = 310**	true
4	7/23 9:00am – 7/24 8:59am	Eligible day 3	Glucose result = 190	
5	7/24 9:00am – 7/25 8:59am	Eligible day 4		
6	7/25 9:00am – 7/26 8:59am	Eligible day 5	Glucose result = 201	
7	7/26 9:00am – 7/27 8:59am	Eligible day 6	Glucose result = 220	
8	7/27 9:00am – 7/28 8:59am	Eligible day 7	**No glucose result**	true
9	7/28 9:00am – 7/29 8:59am	Eligible day 8		
10	7/29 9:00am – 7/30 8:59am	Eligible day 9	Glucose result = 299	

LOS crops at 10 days max

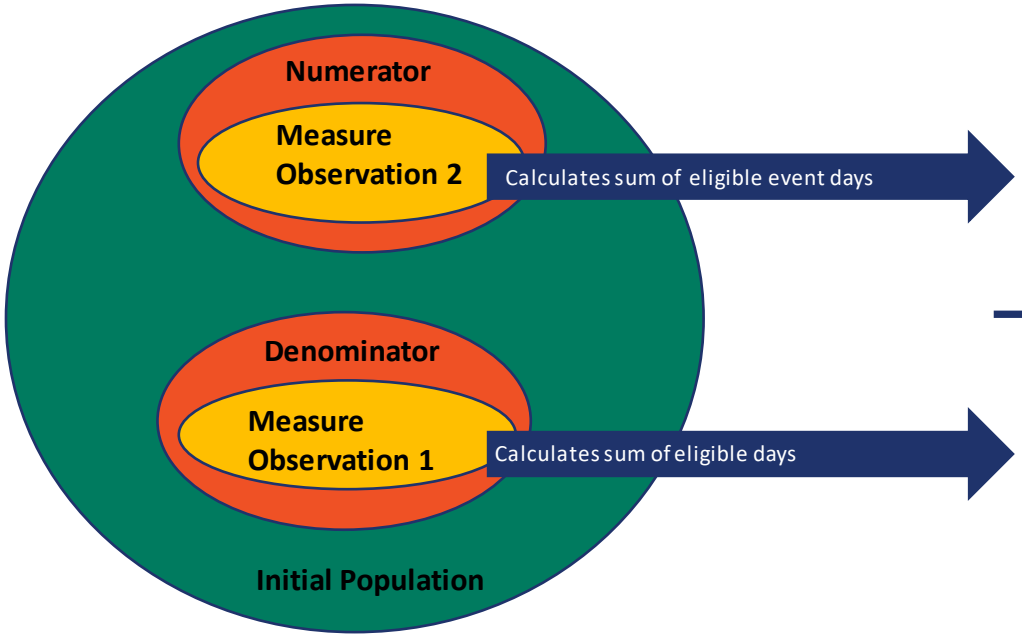
Has No Glucose Test:

DayNumber 2
DayNumber 5
DayNumber 8
DayNumber 9

Has Elevated Result:

DayNumber 1
DayNumber 3
DayNumber 6
DayNumber 7
DayNumber 10

HH-Hyper Measure Observation Calculations



Measure Observation 2:
Number of eligible hyperglycemic event days

Measure Observation 1:
Number of eligible days across each eligible encounter

HH-Hyper Measure Observation 1

The total number of qualifying days which match the initial population/denominator criteria.

```
Measure Observation 1 (Association: Denominator):
                        Sum (
 if QualifyingEncounter.id in "Denominator Exclusions".id then singleton from ("Days with Hyperglycemic Events" EncounterWithEventDays
  where EncounterWithEventDays.encounter = QualifyingEncounter
  return 0)
 else singleton from ( "Days with Hyperglycemic Events“ EncounterWithEventDays  where EncounterWithEventDays.encounter = QualifyingEncounter
  return Count(EncounterWithEventDays.eligibleEventDays)))
```

Measure Observation 1

```
Sum (
 if QualifyingEncounter.id in "Denominator Exclusions".id then singleton from
("Days with Hyperglycemic Events" EncounterWithEventDays
   where EncounterWithEventDays.encounter = QualifyingEncounter
   return 0)
  else singleton from ( "Days with Hyperglycemic Events“ EncounterWithEventDays
   where EncounterWithEventDays.encounter = QualifyingEncounter
   return Count(EncounterWithEventDays.eligibleEventDays)))
```

Denominator Observation Function

```
if QualifyingEncounter.id in "Denominator Exclusions".id then singleton from
("Days with Hyperglycemic Events" EncounterWithEventDays
where EncounterWithEventDays.encounter = QualifyingEncounter
return 0)
  else singleton from ( "Days with Hyperglycemic Events" EncounterWithEventDays
   where EncounterWithEventDays.encounter = QualifyingEncounter
   return Count(EncounterWithEventDays.eligibleEventDays))
```

HH-Hyper Measure Observation 1 (cont'd)

Days in Hospitalization

"Measurement Population" EligibleInpatientHospitalization
let period: Global."HospitalizationWithObservation" (EligibleInpatientHospitalization),
relevantPeriod: "Hospital Days Max 10"(period)
return Tuple {encounter: EligibleInpatientHospitalization, hospitalizationPeriod: period,
relevantPeriod: relevantPeriod, relevantDays: "Days In Period"(relevantPeriod) }

Encounter start: 7/20/23 9:00am
Encounter end: 8/02/23 10:00am

dayNumber	24-hour Intervals start & end	Eligible Days for Measure Observations	Glucose Results	Hyperglycemic Event Days
1	7/20 9:00am – 7/21 8:59am	1st 24 hrs is not eligible	Glucose result = 320	
2	7/21 9:00am – 7/22 8:59am	Eligible day 1		
3	7/22 9:00am – 7/23 8:59am	Eligible day 2	**Glucose result = 310**	true
4	7/23 9:00am – 7/24 8:59am	Eligible day 3	Glucose result = 190	
5	7/24 9:00am – 7/25 8:59am	Eligible day 4		
6	7/25 9:00am – 7/26 8:59am	Eligible day 5	Glucose result = 201	
7	7/26 9:00am – 7/27 8:59am	Eligible day 6	Glucose result = 220	
8	7/27 9:00am – 7/28 8:59am	Eligible day 7	**No glucose result**	true
9	7/28 9:00am – 7/29 8:59am	Eligible day 8		
10	7/29 9:00am – 7/30 8:59am	Eligible day 9	Glucose result = 299	

LOS crops at 10 days max

Denominator Measure Observation: 9 days

HH-Hyper Measure Observation 2

Associated with the Numerator: The total number of hyperglycemic days during the inpatient hospitalization

```
Measure Observation 2 (Association: Numerator):
                        Sum (
                         if QualifyingEncounter.id in "Denominator Exclusions".id then singleton from ( "Days with Hyperglycemic Events“
    EncounterWithEventDays
                          where EncounterWithEventDays.encounter = QualifyingEncounter
                          return 0)
                         else singleton from ( "Days with Hyperglycemic Events" EncounterWithEventDays
                          where EncounterWithEventDays.encounter = QualifyingEncounter
                          return Count(EncounterWithEventDays.eligibleEventDays EligibleEventDay
                            where EligibleEventDay.hasHyperglycemicEvent )))
```

Measure Observation 2 (Association: Numerator):

```
Sum (
 if QualifyingEncounter.id in "Denominator Exclusions".id then singleton from ( "Days with Hyperglycemic Events" EncounterWithEventDays
  where EncounterWithEventDays.encounter = QualifyingEncounter
  return 0)
 else singleton from ( "Days with Hyperglycemic Events" EncounterWithEventDays
  where EncounterWithEventDays.encounter = QualifyingEncounter
  return Count(EncounterWithEventDays.eligibleEventDays EligibleEventDay
    where EligibleEventDay.hasHyperglycemicEvent ))
```

Numerator Observation function

```
singleton from ( “Days with Hyperglycemic Events" EncounterWithEventDays
  where EncounterWithEventDays.encounter = QualifyingEncounter
  return Count(EncounterWithEventDays.eligibleEventDays EligibleEventDay
    where EligibleEventDay.hasHyperglycemicEvent))
```

HH-Hyper Measure Observation 2 (cont'd)

Days with Hyperglycemic Events

```
"Days with Glucose Results" EncounterWithResultDays
  let eligibleEventDays: EncounterWithResultDays.relevantDays EncounterDay where EncounterDay.dayNumber > 1
    return Tuple { dayNumber: EncounterDay.dayNumber, dayPeriod: EncounterDay.dayPeriod, hasHyperglycemicEvent: ( EncounterDay.hasSevereResult
                or (EncounterDay.hasNoGlucoseTest and EncounterWithResultDays.relevantDays[EncounterDay.dayIndex- 2].hasElevatedResult
                and EncounterWithResultDays.relevantDays[EncounterDay.dayIndex - 3].hasElevatedResult ) ) }  return Tuple { encounter:
                 EncounterWithResultDays.encounter, relevantPeriod: EncounterWithResultDays.relevantPeriod, eligibleEventDays: eligibleEventDays }
```

Encounter start: 7/20/23 9:00am
Encounter end: 8/02/23 10:00am

dayNumber	24-hour Intervals start & end	Eligible Days for Measure Observations	Glucose Results	Hyperglycemic Event Days
1	7/20 9:00am – 7/21 8:59am	1st 24 hrs is not eligible	Glucose result = 320	
2	7/21 9:00am – 7/22 8:59am	Eligible day 1		
3	7/22 9:00am – 7/23 8:59am	Eligible day 2	**Glucose result = 310**	true
4	7/23 9:00am – 7/24 8:59am	Eligible day 3	Glucose result = 190	
5	7/24 9:00am – 7/25 8:59am	Eligible day 4		
6	7/25 9:00am – 7/26 8:59am	Eligible day 5	Glucose result = 201	
7	7/26 9:00am – 7/27 8:59am	Eligible day 6	Glucose result = 220	
8	7/27 9:00am – 7/28 8:59am	Eligible day 7	**No glucose result**	true
9	7/28 9:00am – 7/29 8:59am	Eligible day 8		
10	7/29 9:00am – 7/30 8:59am	Eligible day 9	Glucose result = 299	

LOS crops at 10 days max

Numerator Measure Observation: 2 days

HH-Hypo Severe Hypoglycemia

HH-Hypo - Rationale

Description:
Inpatient hospitalizations for patients 18 years of age or older at admission, who were administered at least one hypoglycemic medication during the encounter and who suffer the harm of a severe hypoglycemic event during the encounter

- **Rational/Intent:**
- Severe Hypoglycemia is a hospital harm event
  - One of the most common adverse drug events
  - Rates of inpatient hypoglycemia events indicate quality of care
  - Preventable by careful use antihyperglycemic medications

- **Goals:**
  - Improve safety for patients at risk
  - Track and trend performance
  - Drive implementation of best practices

HH-Hypo Measure Specifications

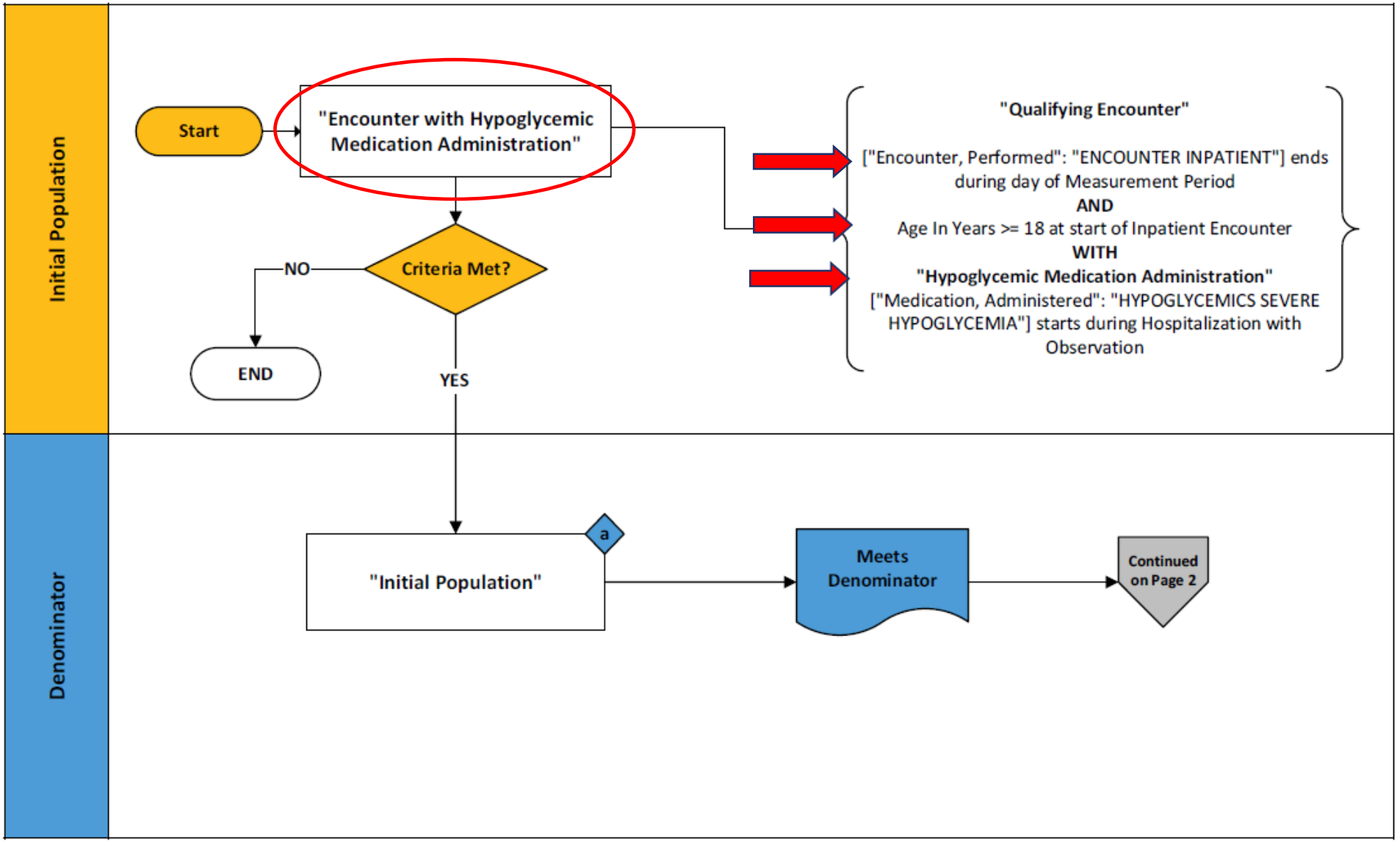
Description: The number of inpatient hospitalizations for patients age 18 and older who were administered at least one hypoglycemic medication during the encounter who suffer the harm of a severe hypoglycemic event during the encounter

Initial Population (IP) (Denominator = IP)	Denominator Exclusion	Numerator
Inpatient hospitalization	None	Inpatient hospitalization
Age: >= 18 at the start of the ~~Global.HospitalizationWithObservation~~ inpatient hospitalization		A severe hypoglycemic event occurred during the encounter
At least one hypoglycemic medication was administered during the encounter		A severe hypoglycemic event is defined as: - A ~~blood~~ glucose result less than 40 mg/dL AND - A hypoglycemic medication administered within 24 hours prior to the start of the severe hypoglycemic event (i.e., the glucose result less than 40 mg/dL) AND - No subsequent repeat test for ~~blood~~ glucose with a result greater than 80 mg/dL within five minutes of the time of the initial ~~blood~~ glucose test with result less than 40mg/dL The 24-hour and 5-minute timeframes are based on the time the ~~blood~~ glucose was drawn, as this reflects the time the patient was experiencing that specific glucose level. Only one qualifying severe hypoglycemic event is counted in the numerator, and only one severe hypoglycemic event is counted per encounter.

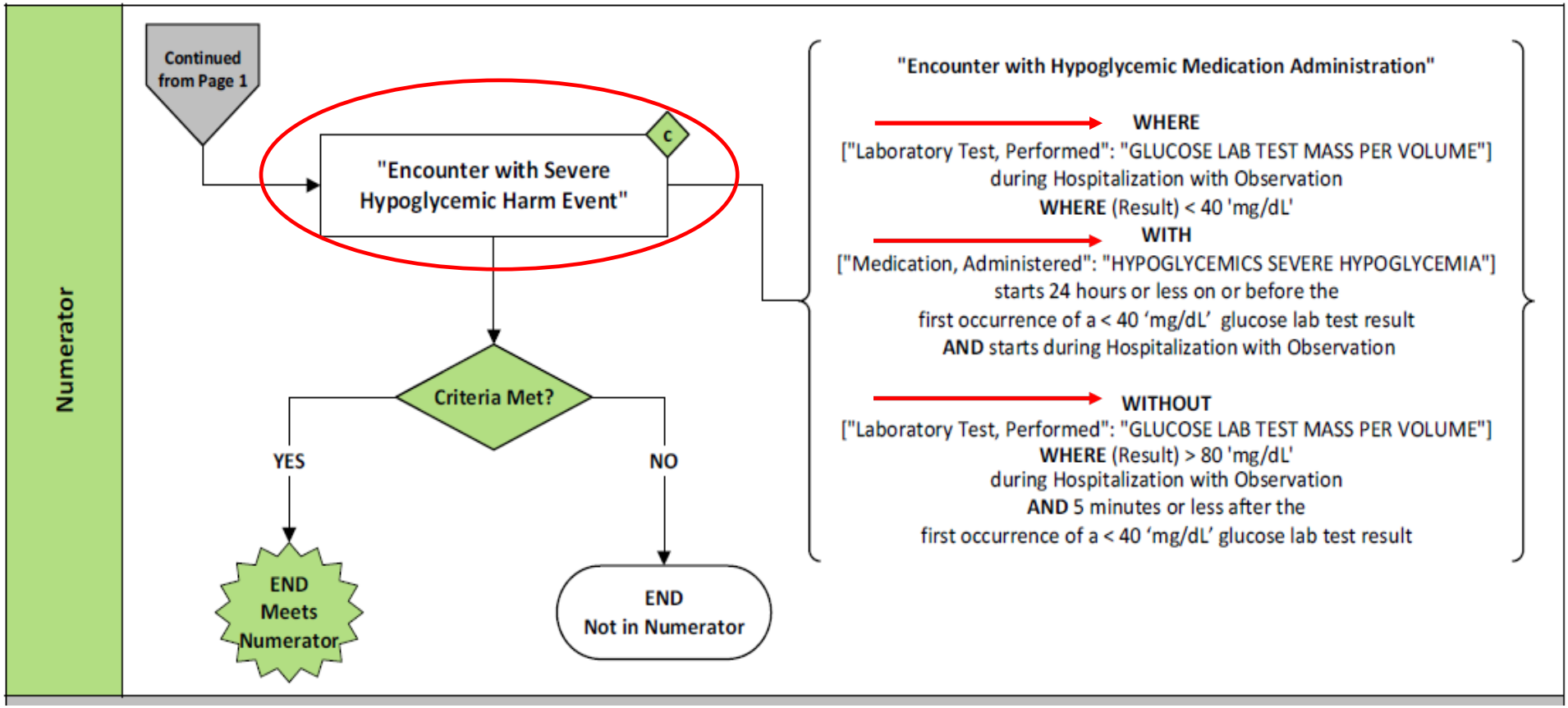
HH-Hypo Measure Changes from 2023 to 2024 –Technical

Measure Components	2023 Reporting Year	2024 Reporting Year
Numerator description	Only the first qualifying severe hypoglycemic event is counted in the numerator	Only ~~the first~~ one qualifying severe hypoglycemic event is counted in the numerator
Numerator definition: Encounter with Severe Hypoglycemic Harm Event	"Encounter With Hypoglycemic Medication Administration" QualifyingEncounter where exists (["Laboratory Test, Performed": "Glucose Lab Test Mass Per Volume"] BloodGlucoseLab1 with ["Medication, Administered": "Hypoglycemics Severe Hypoglycemia"] HypoglycemicMed such that Global."NormalizeInterval" (HypoglycemicMed.relevantDatetime, HypoglycemicMed.relevantPeriod) starts 24 hours or less before or on BloodGlucoseLab1.relevantDatetime and Global."NormalizeInterval" (HypoglycemicMed.relevantDatetime, HypoglycemicMed.relevantPeriod) starts during Global."HospitalizationWithObservation" (QualifyingEncounter) without ["Laboratory Test, Performed": "Glucose Lab Test Mass Per Volume"] BloodGlucoseLab2 such that BloodGlucoseLab2.relevantDatetime during Global."HospitalizationWithObservation" (QualifyingEncounter) and BloodGlucoseLab2.relevantDatetime 5 minutes or less after BloodGlucoseLab1.relevantDatetime and BloodGlucoseLab2.result > 80 'mg/dL' where BloodGlucoseLab1.relevantDatetime during Global."HospitalizationWithObservation" (QualifyingEncounter) and BloodGlucoseLab1.result < 40 'mg/dL')	from "Denominator" QualifyingEncounter, "Severe Hypoglycemic Harm Event" HypoglycemicEvent let GlucoseTestTime: Global."EarliestOf" (HypoglycemicEvent.relevantDatetime, HypoglycemicEvent.relevantPeriod), HospitalizationInterval: Global."HospitalizationWithObservation" (QualifyingEncounter) where GlucoseTestTime during HospitalizationInterval return QualifyingEncounter Severe Hypoglycemic Harm Event "Glucose Test with Result Less Than 40" LowGlucoseTest where not (LowGlucoseTest.id in "Low Glucose Test Followed By Glucose Test Result Greater Than 80".id)

HH-Hypo Measure Flow Diagram



HH-Hypo Measure Flow Diagram (cont'd)



HH-Hypo Measure Flow Diagram (cont'd)

Sample Calculation
$\text{Performance Rate} = \frac{\text{Numerator } (c = 20)}{\text{Denominator } (a = 80)} = 25\%$

HH-Hypo Initial Population

Inpatient hospitalizations that end during the measurement period for patients age 18 and older and at least one hypoglycemic medication was administered during the encounter.

Initial Population: "Encounter with Hypoglycemic Medication Administration"

Encounter with Hypoglycemic Medication Administration

```
"Qualifying Encounter" InpatientHospitalization
    with "Hypoglycemic Medication Administration" HypoglycemicMedication
      such that Global."NormalizeInterval" ( HypoglycemicMedication.relevantDatetime,
    HypoglycemicMedication.relevantPeriod )
    starts during Global.HospitalizationWithObservation ( InpatientHospitalization )
```

Qualifying Encounter

```
["Encounter, Performed": "Encounter Inpatient"] InpatientEncounter
where InpatientEncounter.relevantPeriod ends during day of "Measurement Period"
 and AgeInYearsAt(date from start of InpatientEncounter.relevantPeriod)>= 18
```

Hypoglycemic Medication Administration

```
["Medication, Administered": "Hypoglycemics Severe Hypoglycemia"]
```

HH-Hypo Denominator

Inpatient hospitalizations for patients age 18 and older and at least one hypoglycemic medication was administered during the encounter.

Denominator: "Initial Population"

Initial Population

"Encounter with Hypoglycemic Medication Administration"

HH-Hypo Numerator

Inpatient hospitalizations where a severe hypoglycemic event occurred during the encounter.

A severe hypoglycemic event (harm) is defined as: a laboratory or point-of-care (POC) test for ~~blood~~ glucose with a result less than 40 mg/dL, where a hypoglycemic medication was given within the 24 hours prior to the start of the low glucose event (i.e., ~~blood~~ glucose result less than 40 mg/dL) and administered during the encounter (including emergency department and observation stays contiguous with the admission). The 24-hour timeframe extends from the end of the medication administration to the time of the glucose test.

The measure does not count a severe hypoglycemic event (harm) in the numerator if there is a repeat test for ~~blood~~ glucose with a result greater than 80 mg/dL within five minutes of this initial low ~~blood~~ glucose test. The purpose of the repeat test within 5 minutes is to eliminate false positives that can occur in POC testing. The 5-minute timeframe extends from the start of the severe hypoglycemic test to the time of the repeat hypoglycemic test.

Numerator: "Encounter with Severe Hypoglycemic Harm Event"

- A ~~blood~~ glucose result less than 40 mg/dL

AND

- A hypoglycemic medication administered within 24 hours prior to the start of the severe hypoglycemic event (i.e., the ~~blood~~ glucose result less than 40 mg/dL)

AND

- No subsequent repeat test for ~~blood~~ glucose with a result greater than 80 mg/dL within five minutes of the time of the initial ~~blood~~ glucose test with result less than 40mg/dL

HH-Hypo Numerator (cont'd)

Inpatient hospitalizations where a severe hypoglycemic event occurred during the encounter.

Numerator: "Encounter with Severe Hypoglycemic Harm Event"

Encounter with Severe Hypoglycemic Harm Event

```
from
  "Denominator" QualifyingEncounter,
  "Severe Hypoglycemic Harm Event" HypoglycemicEvent
  let GlucoseTestTime: Global."EarliestOf" ( HypoglycemicEvent.relevantDatetime, HypoglycemicEvent.relevantPeriod ),
  HospitalizationInterval: Global."HospitalizationWithObservation" ( QualifyingEncounter )
  where GlucoseTestTime during HospitalizationInterval
  return QualifyingEncounter
```

Severe Hypoglycemic Harm Event

```
"Glucose Test with Result Less Than 40" LowGlucoseTest
  where not ( LowGlucoseTest.id in "Low Glucose Test Followed By Glucose Test Result Greater Than 80".id )
```

HH-Hypo Numerator (cont'd)

Inpatient hospitalizations where a severe hypoglycemic event occurred during the encounter.

Numerator: "Encounter with Severe Hypoglycemic Harm Event"

Severe Hypoglycemic Harm Event

```
"Glucose Test with Result Less Than 40" LowGlucoseTest
  where not ( LowGlucoseTest.id in "Low Glucose Test Followed By Glucose Test Result Greater Than 80".id )
```

HH-Hypo Numerator Example

Inpatient hospitalizations where a severe hypoglycemic event occurred during the encounter.

Numerator: "Encounter with Severe Hypoglycemic Harm Event"

		Glucose result value	Severe hypoglycemic event (Numerator)
Encounter start	4/3/2023 8:00am		
Encounter end	5/11/2023 11:00am		
Hypoglycemic medication administered	5/2/23 11:00am		
Glucose test1 performed	**5/2/23 11:10am**	**39 mg/dL**	**TRUE**
Glucose test2 performed	5/2/23 3:00pm	37 mg/dL	
Glucose test3 performed	5/2/23 3:05pm	85 mg/dL	
Glucose test4 performed	**5/2/23 7:00pm**	**35 mg/dL**	**TRUE**

Additional Resources

eCQI Resource Center – EH Measures:
https://ecqi.healthit.gov/eligible-hospital/critical-access-hospital-ecqms

Teach Me Clinical Quality Language (CQL) Video Series
https://ecqi.healthit.gov/cql?qt-tabs_cql=2

- Coalesce
- Normalize Interval
- Time Zone Considerations
- Latest, LatestOf, Earliest, EarliestOf, HasStart, HasEnd

Pioneers In Quality
https://www.jointcommission.org/measurement/pioneers-in-quality/

Expert to Expert
https://www.jointcommission.org/measurement/quality-measurement-webinars-and-videos/expert-to-expert-webinars/

ONC Issue Tracking System
https://oncprojectracking.healthit.gov/

Live Q&A Segment

- Please submit questions via the question pane
- Click the Question mark icon in the audience toolbar
- A panel will open for you to type and submit your question
- Include slide reference number when possible
- All questions not answered verbally during the live event will be addressed in a written follow-up Q&A document
- The follow-up document will be posted to the Joint Commission website several weeks after the live event

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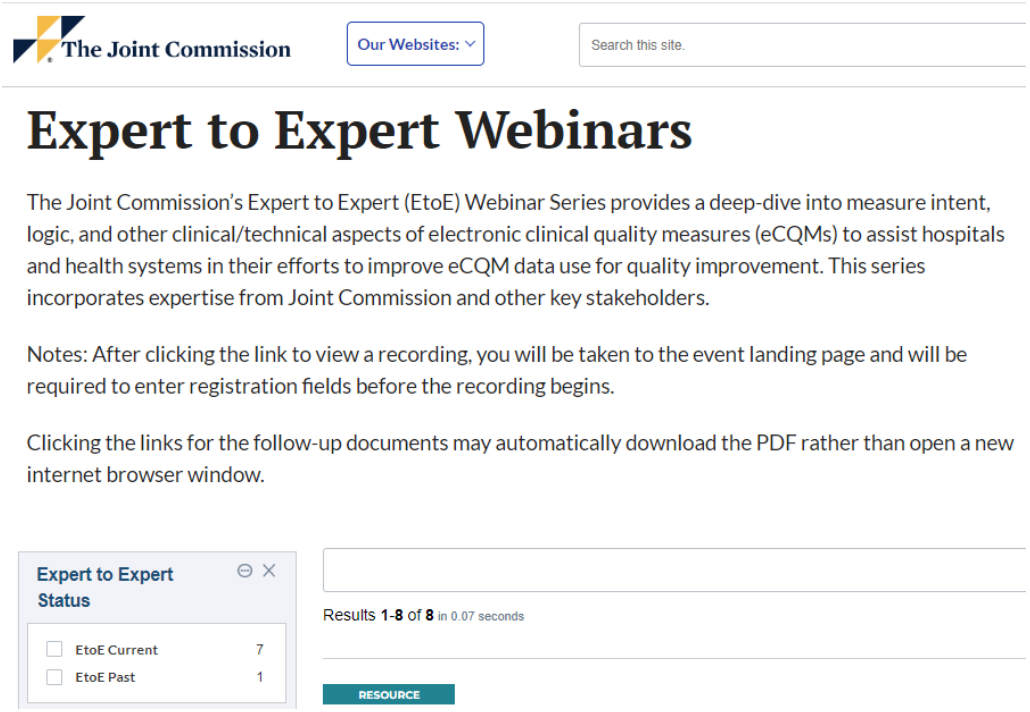
https://www.jointcommission.org/measurement/quality-measurement-webinars-and-videos/expert-to-expert-webinars/



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Acronyms

CDC	Centers for Disease Control and Prevention
CE	Continuing Education
CGM	Continuous glucose monitor
CMS	Centers for Medicare & Medicaid Services
CQL	Clinical quality language
CY	Calendar year
eCQI	Electronic Clinical Quality Improvement Resource Center
eCQM	Electronic clinical quality measure
EH	Eligible Hospital
EHR	Electronic Health Record
FAQ	Frequently asked questions
FY	Fiscal year
HH	Hospital Harm
ICD10	International Classification of Diseases, Tenth Revision

Acronyms (continued)

IQR	Inpatient quality reporting
LOS	Length of stay
mg/dL	milligrams per deciliter
MO	Measure observation
ONC	Office of the National Coordinator for Health Information Technology
SME	Subject matter expert
VSAC	Value Set Authority Center

Pioneers in Quality Expert to Expert Series 2023 Annual Update Webinar for 2024 Reporting Year for Severe Hyperglycemia and Severe Hypoglycemia

Broadcast date: December 7, 2023

00:00:04

Welcome everyone and thank you for joining us today for our Expert to Expert Series Webinar: 2024 Annual Updates for the Hospital Harm, Severe Hyperglycemia and Severe Hypoglycemia eCQMs.

Before we start, just a few comments about today's webinar platform. Audio is by Voice Over Internet Protocol only. Click the button that reads Listen In - Click for audio, then use your computer speakers or headphones to listen. There are no dial-in lines. Participants are connected in listen only mode. Feedback or dropped audio are common for live streaming events. Refresh your screen or rejoin the event if this occurs.

We will not be recognizing the Raise a Hand or Chat features. To ask a question, click on the question mark icon in the audience toolbar. A panel will open for you to type your question and submit.

The slides are designed to follow Americans with Disabilities Act rules. We would like to welcome you to our webinar. Before we get started, we do want to explain that this webinar is fairly technical in nature and requires a baseline understanding of eCQMs. Participant feedback from previous webinars indicated that the content may have been too technical for individuals that are new to eCQMs. If you are new to eCQMs, we recommend that you visit the eCQI Resource Center at the Hyperlink listed on this slide. You'll find a collection of resources to help you get started with eCQMs.

The slides are available now and can be found within the viewer toolbar. To access the slides, click the icon that looks like a document, select the file name and the document will open in a new window. You can print or download and save the slides. Slides will also be available several weeks after the broadcast at the link denoted on this slide.

CE Credit is offered for this 90-minute webinar. This webinar is approved for 1.5 continuing education credits for the entities listed on this slide: the Accreditation Council for Continuing Medical Education, American Nurses Credentialing Center, American College of Healthcare Executives, California Board of Registered Nursing, and the International Association for Continuing Education and Training.

To claim CE Credit for this webinar, you must have individually registered for the webinar, participate for the entire live broadcast and complete a post-program evaluation and attestation. The program evaluation and attestation survey is accessible on the final slide via a QR code, you can scan with your mobile device and tomorrow an email will be sent to the email address each participant used to register. If you are listening with colleagues and did not use your own link or phone line to join, you can still obtain CE Credit if you meet these three criteria. If you did not pre-register, do so now so you can be eligible when the session concludes.

When you complete the online evaluation survey, after you click Submit, you will be redirected to a page from which you can print or download and save A PDF CE certificate. An automated email will

also be sent after you complete the survey that includes the link to the certificate. For more information on The Joint Commission's continuing education policies, visit the link at the bottom of this slide.

The learning objectives for this session are:

Navigate to the measure specifications, value sets, Measure Flow Diagrams and technical release notes.

Apply concepts learned about the logic and intent for the Severe Hyper and Hypoglycemia eCQMs.

Prepare to implement the Severe Hyper and Hypoglycemia eCQMs for the 2024 eCQM reporting period and

identify common issues and questions regarding the Severe Hyper and Hypoglycemia eCQMs.

This webinar does not cover these topics: Basic eCQM concepts, topics related to chart abstracted measures, process improvement efforts related to this measure, eCQM validation.

These staff and speakers have disclosed that they do not have any conflicts of interest. For example, financial arrangements, affiliations with or ownership of organizations that provide grants, consultancies, honoraria, travel or other benefits that would impact the presentation of today's webinar content. Myself, Susan Funk, Mia Nievera, Michelle Lefebvre, Melissa Breth, and Susan Yendro.

00:05:13

The agenda for today's discussion follows; demonstrate navigation to measure specifications, value sets, Measure Flow Diagrams and technical release notes. Review the measure flow and algorithm. Review changes made to the Severe Hyper and Hypoglycemia eCQMs. Address Frequently Asked Questions and then we will have a facilitated audience Q&A segment.

Before we get started with our measures, we would like to highlight some of the resources available on the CMS eCQI Resource Center. The eCQI Resource Center provides a centralized location for news, information, tools and standards related to eCQMs. The majority of tools and resources referenced within the eCQI Resource Center are openly available for stakeholder use and provide a foundation for the development, testing, certification, implementation, reporting, and continuous evaluation of eCQMs.

We will now share a demo that illustrates navigation to the eCQI Resource Center. I'm sorry, please hold for just a moment. We are having a problem getting the video to load. All right, there we go.

Thank you everyone for your patience and I'm now going to share this demo.

00:06:54

This video will demonstrate how to navigate the eCQI Resource Center website to locate the measure specifications, value sets, and technical release notes for all measures in the CMS program. Here's a landing page for the eCQI Resource Center. Note the web address of ecqi.healthit.gov. Click on the orange horizontal rectangle for Eligible Hospital/Critical Access Hospital eCQMs. Here you can select

the reporting period that you are interested in. For the purposes of this demo, I will select 2024. Click Apply Filters and you will see multiple resources listed.

Click on the EH/CAH eCQM tab. Here you will see a list of the 12 eCQMs available for Eligible Hospital and Critical Access Hospitals. Let's select the cesarean birth eCQM, which is also referred to as PC-02 for short or CMS334. Here you will see all the measure information for this particular measure. We're going to click on the Specifications and Data Elements tab. Here you can find the HTML file, the measure package zip file, and the technical release notes for this measure. The value sets are also listed here. We will take a quick look at the HTML document, which is also referred to as the Human Readable. By clicking on the file name, the HTML file opens.

This is where you find all details related to the measure. The top portion of the document highlighted in gray is referred to as the metadata or header information.

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Here you will find relevant data for the measure including the version number of the measure, the Measure Steward, the Measured Developer, additional information related to the rationale, the Clinical Recommendation Statement, and here you see all the references that were used when building the eCQM measure. Scrolling through all the references, you'll find additional guidance for implementing the measure. And down at the bottom of the metadata, you will find definitions for each of the population criteria. Beyond the metadata, you will find the definitions for the population criteria. And then further down you will see the definitions that are used making up the logic. Continuing to scroll, you will see all the functions that are used by the measure. Then we get into the terminology. Notice these first couple of lines are the direct reference codes that are used by the measure and then the value sets are listed here. Then we get into the QDM data elements, the supplemental data elements and if this is a risk adjusted measure, that information would be listed here.

This is your source of truth for all of the measure details, I went through this very quickly but wanted you to be aware of how to locate this document and to have a basic understanding of its contents. So back to the eCQI Resource Center, the next item is the zip file. Click on this link and then click to open the zip file. Here you'll see all the files that make up the measure package. Note the first file is the HTML file we just looked at. I will not go into detail on all of these files but if you want to know more, go to the Get Started with eCQM site on this eCQI Resource Center.

Next we look at the technical release notes by clicking on this link and opening up the Excel spreadsheet. Here is a nice concise list of all of the changes to the measures for the 2024 reporting period.

In the first column, you will see the details of the change listed here. The next column indicates the type of change, did it impact the header, the logic or the value set? The next column is a specific section of the measure that was impacted. In this last column, you will see the Source of Change. Going back to the eCQI Resource Center website again, we can access the value sets by clicking the link under Value Sets.

You are now taken to the Value Set Authority Center, also known as the VSAC. You will see all the value sets used for this eCQM. Please notice that you must be signed into the Value Set Authority

Center to see the details within each value set. I will log into the VSAC now by clicking on Sign In and then by clicking the login button. If I would like to see the details of the abnormal presentation value set, I click on the OID and all of the codes making up that value set are displayed.

Please note that if you prefer to download the value sets, select all value sets by clicking in this box and click Download. This will return a zip file containing each value set in a separate Excel document. If you prefer to have all of the value sets in one file, go back to the homepage, select the Eligible Hospital/Critical Access Hospital eCQMs tab again, select the reporting period that you're interested in, I'm going to stick with 2024 and click Apply Filters.

On this page you will see eCQM and hybrid measure value sets as well as eCQM Direct Reference Code List. Let's look at the value sets. Open the most recent reporting year or whatever year you're interested in. I'm going to stick with 2024 and then click on the May 2023 release. You'll see several available downloads. Choosing the first option, I will select data sorted by CMS ID in Excel format. Opening the downloaded Excel file, so open the Excel spreadsheet here and here you will see all the tabs for all the different measures. Let's stick with CMS334 and here you see the CMS ID, NQF number, value set name and value set OID for every code for every value set within the measure.

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Scrolling over to column L, you will see the actual codes within each value set, the code description and the code system. Note that direct reference codes are not listed here as they are not included in value sets. You'll find information on direct reference codes in the measure specifications or from the file on the eCQM resources tab that I just called out. This concludes our eCQI Resource Center navigation demo.

Mia, when you're ready and the presentation is up, feel free to take it away. Thank you, Susan. Mia, we're seeing your speaker's notes on the current view. I think you need to just put it as slide presenter mode. Thanks. Perfect, thank you. Sorry about that. Thanks Susan. Good day everyone. Today we will be reviewing the annual updates made to the Hospital Harm Severe Hyperglycemia and the Severe Hypoglycemia measures for the 2024 reporting period.

As a quick note for those that are new to these measures, these measures were adopted into CMS quality programs in fiscal year 2022, which means since January 1st, 2023, organizations were able to self-select either measure for voluntary reporting for the 2023 reporting period for the 2025 payment determination. And before we break into the individual measures, here we share the global changes made to both measures from the 2023 to the 2024 measure versions indicated by the red fonts and strikeouts.

So, beginning with the Initial Population, the criteria for age 18 years and older is now determined at the start of the inpatient Encounter rather than depending on the Encounter start time, which could be during the ED visit or during observation or at the inpatient. So, with this change, the age criteria will always be evaluated at the start of the inpatient Encounter.

We also expanded the specimen source for the glucose tests, from blood, serum and plasma to include interstitial fluid tests. These are typically obtained via continuous glucose monitors and subsequently any references to blood glucose was revised to just glucose since we are no longer constrained to blood specimens.

We also revised the timing associated with laboratory tests performed data elements to use the function global earliest of. This is used to select the starting point of a period if the period has a start timestamp specified, otherwise it will return the endpoint of that period.

As it happens each year, multiple value sets have code additions and or deletions due to code system updates, measure updates or feedback received from our clinical and technical experts and through the public using Jira.

So now let's dive into the Severe Hyperglycemia measure.

This measure is an outcome ratio measure to assess the number of inpatient hospital days for patients age 18 and older with a Hyperglycemic Events per the total qualifying inpatient hospital days for that Encounter. As I've shared previously, this measure does not aim to measure overall glucose control and hospitalized patients. Rather the goal is to assess the occurrence and the extent of Severe Hyperglycemia. This measure is intended to be used in combination with its companion measure, Severe Hypoglycemia to reduce unintended consequences of measurement.

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Hyperglycemia is common among hospitalized patients, especially those with preexisting diabetes but can also affect individuals with no prior history of diabetes and may be induced by medications such as steroids or tube feedings. Patients with elevated blood glucose of greater than 200 milligrams per deciliter are considered Hyperglycemic and are considered at high risk for Severe Hyperglycemia. Severe Hyperglycemia where the blood glucose level is extremely elevated is significantly associated with a range of harms including increased in hospital mortality, infection rates and hospital length of stay. Lower rates of inpatient Severe Hyperglycemia may not only improve care for patients but also reduce costs for healthcare payers. The rate of inpatient Hyperglycemia can be considered a marker for quality of hospital care since inpatient Hyperglycemia is largely avoidable with proper glycemic management.

All right, so in the next few slides, we'll show a high-level summary of the changes made across each population. The intent of this measure, again, is to measure the number of inpatient hospital days for patients with age 18 and older with a Hyperglycemic Events per the total qualifying inpatient hospital days for that Encounter.

In the first column, we have the Initial Population which is also equal to the Denominator. A patient must have been admitted into an inpatient Encounter to qualify. As noted earlier, the age criteria is now evaluated at the inpatient start time where the patient must be 18 years of age or older with at least one of the following: A diagnosis of diabetes before or during the Encounter, an administration or at least one dose of a hypoglycemic medication during the counter, or at least one glucose with a value of greater than or equal to 200 milligrams per deciliter during the Encounter.

From the Denominator logic, the logic evaluates for any Denominator Exclusions. Patients with an initial glucose a result greater than or equal to a thousand milligrams per deciliter between one hour prior to the start of the hospitalization Encounter to six hours after the start of the Encounter. Since this is a ratio measure which I'll review in the next slide, the Numerator is derived from the Initial Population.

Numerator looks for patients with a Hyperglycemic Events within the first 10 days of the Encounter minus the first 24 hours and minus the last period before discharge, if that last day is less than 24 hours. A Hyperglycemic Events is defined as a day with at least one glucose greater than 300 or a day where glucose test and result is not found and it was preceded by two consecutive days where at least one value during each of those few days was greater than or equal to 200 milligrams per deciliter. The majority of hospital eCQMs are proportion measures, but as I mentioned, Hyperglycemia, Severe Hyperglycemia is a ratio measure where in addition to the Initial Population, Denominator, and Numerator, we have Measure Observations that are calculated. Again, we'll get more into detail explanation between a ratio versus a proportion later in this presentation, but for now, the measure has two Measure Observations.

*Of note, the intent of these observations have not changed since the last annual update. In Measure Observation one, this is associated with the Denominator, and this is the total number of eligible days of the inpatient hospitalization which matched the Initial Population in the Denominator criteria and did not meet the Denominator Exclusion criteria. Measure Observation two is associated with the Numerator and this is a total of Hyperglycemic days during the inpatient hospitalization that meet the Numerator criteria. The days with Hyperglycemic Events are defined as all days with the glucose level greater than 300 except those occurring in the first 24-hour period or all days where glucose was not measured, again, and it was pre immediately preceded by two consecutive days where at least one glucose value during each of those two days was greater than or equal to 200. So the

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updated language seen in red here was added to further clarify the two days before a day without a glucose measurement are immediately prior to and continuous. Note that the length of stay for all eligible inpatient Encounters was also truncated to less than or equal 10 days when the length exceeds 10 days. Again, this last day is not counted if it was less than 24-hour period as this is not considered a full hospital day.

So, although the intent has not changed, we updated the Denominator Measure Observation function to return zero for the Measure Observations results for Encounters that meet the Denominator Exclusion. This was to address an issue with the eCQM calculation where cases that met the Denominator Exclusion continue to evaluate for the Numerator and Measure Observations.

Similarly, an update was made to Numerator Measure Observations function to return zero for the Measure Observations to remove these Exclusion criteria from being evaluated in Measure Observation.

The Exclusion logic was revised to constrain the glucose test to the qualifying Encounter and to decrease data processing performance issues by restricting the valuation to only the pertinent glucose tests of the qualifying Encounter and we'll get more into the detail on this later on in the presentation during the logic review.

As I mentioned, this measure is a ratio measure, and this slide is to illustrate the key differences between a proportion measure compared to a ratio.

As you see, both measures contain similar measure components. They both have an Initial Population, Denominator and Numerator. In a proportion, the Numerator is a subset of the Denominator, so the Numerator over Denominator equals the measure score. However, in a ratio, the Numerator and Denominator are derived from the Initial Population and evaluated independently. The Numerator and Denominator are not the measure outcomes but rather the populations that are used to apply the Measure Observations, and it's the Measure Observations that calculate the measure score. Measure Observation one as the bottom number of the ratio and Measure Observation two as the top number of the ratio.

Next, I'd like to share the Measure Flow Diagrams with you. The Measure Flow Diagrams provide a high-level overview of the algorithm flows and can be found on the eCQI Resource Center. The measure specifications are the source of truth, as mentioned, but the flow diagrams are helpful in understanding these main concepts.

So, you'll want to navigate to the eCQI Resource Center at ecqi.healthit.gov and click on the Eligible Hospital/Critical Access Hospital eCQMs.

From there, we'd like to select the reporting period you are interested in and click on the Resources tab.

Now scroll down through the eCQM resources and click on the eCQM flow zip file. Once you open the zip file, you will see the measure flows for all measures in the CMS Hospital Inpatient Quality Reporting Program.

So, beginning with the Initial Population for this measure; Encounter with existing diabetes diagnosis or Encounter with Hyperglycemic medication, or Encounter with elevated glucose greater than or equal to 200. For each of these conditions must be met to qualify for the Initial Population. An inpatient Encounter must be present. And two, the patient must be greater than or equal to 18.

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With a diagnosis of diabetes within that green box or an administration of hypoglycemic medication highlighted in blue or a glucose lab test with a result greater than or equal to 200 milligrams per deciliter in that aqua color. If the criteria is met, the patient is in the Initial Population. If not, the patient is not in IP and processing event ends.

The Denominator is equal to the Initial Population.

And so, let's move to the Denominator Exclusions where a patient must have an initial glucose greater than or equal to 1,000 within one hour prior to and six hours after the Encounter start.

If this criteria is met, the Encounter will be excluded from the Denominator.

Moving to Numerator, a patient will get in the Numerator if the Encounter has at least one Hyperglycemic Events and the Hyperglycemic Events can be met in two different ways outlined by these two red arrows.

A day where there is a glucose lab test with result greater than 300 milligrams per deciliter or a day where there's no glucose lab tests with results and is proceeded by two consecutive days where at

least one glucose value during each of those two days was greater than or equal to 200 milligrams per deciliter.

Going to the Measure Observations, in Measure Observation one, this is associated with that Denominator. The logic uses days in hospitalization to return the day number for each day within the hospitalization period to determine the Eligible Hospital days and uses days with glucose results to filter the eligible Encounters. So, Measure Observation one then returns the number of eligible events, event days that meet the Denominator criteria. Again, zero is returned if the Denominator Exclusion is met.

Measure Observation two is associated with the Numerator. The days with Hyperglycemic Events logic uses the following to identify the number of the Hyperglycemic Events days for each eligible Encounter; days in hospitalization, which returns the day number for each day within the hospitalization period to determine the eligible Hyperglycemic Events days and days with glucose results, which filters again the eligible Encounters.

So, Measure Observation two then returns the count or the number of days with a Hyperglycemic Events. Zero again is returned if the Denominator Exclusion is met.

Now that the Numerator Denominator and Exclusions, Measure Observations are defined, we can plug the quantities into the calculation formula. So, the performance rate aggregates the populations into a single performance rate for measure reporting purposes. In this example, Measure Observation two, which is with the Numerator, is divided by Measure Observation one associated by the Denominator minus any Denominator Exclusions.

All right, so now let's get into the logic review and quickly level set on the layout of the slide. At the top of the slide here describes the population narrative followed by the CQL measure population logic definition in that bold blue text box. Beneath that will be all the nested definitions used to create the population and what I mean by nested is that the definitions are presented in this waterfall format starting at the bottom definition with an arrow pointing into where it is nested within the next definition above.

And this is a pattern repeated throughout the presentation, so wanted to highlight this here. You'll also see some yellow highlights which indicate key elements I will be speaking to on the slide for simple name changes or alignments with the standards. Those will not be a focal point for today's discussion but something to note for your reference. The red text indicates a change from last year. Okay, so with that said, let's begin with this first criteria in the Initial Population and we are looking for a history of diabetes diagnosis. And beginning with the broadest criteria, we want to define that qualifying Encounter and this creates the inpatient Encounter where the patient has to be 18 years of age at the start of the inpatient Encounter during the measurement period.

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Following those arrows upwards, the qualifying Encounter is nested within the Encounter with hospitalization period definition. And now in this definition we use a Tuple. A Tuple is used to collate the information being asked for into a list. So, looking at this logic, we are asking to return or compile a list that for every qualifying Encounter include the inpatient hospitalization code, the hospitalization start and end times. I want to point out here that the measure uses this global hospitalization with

observation function to determine the interval of the entire inpatient hospitalization Encounter, which includes the time in the emergency department or observation when these Encounters are within one hour or less of each other and of the inpatient admission. So, in using this Tuple concept as a developer, we can use this collated information elsewhere in the logic, but also for measure implementers, it makes the data easier to analyze and troubleshoot for issues. And I highlight this because we do use this concept a lot in the measure, so it's something to keep in mind as we go through the specifications.

All right, so now following the arrow upwards again to the Encounter with existing diabetes diagnosis, we are looking for a diabetes diagnosis where the prevalence period or the onset of diabetes can start any time before discharge.

This is the second criteria to get into the Initial Population. No logic changes are made in this definition. We are looking for the administration of a hypoglycemic medication to the patient during the hospitalization. The hypoglycemic treatment medication value set includes medications such as metformin and insulin as an example. Here in the third criteria, we are looking if a glucose test was done during the hospitalization.

The dot relevant time, date time refers to the lab draw time and the dot result should be greater than or equal to 200 milligrams per deciliter.

Notice earliest of is highlighted yellow as this is new logic change this year, the earliest of operator again, evaluates the time of the glucose test, relevant date time, and the relevant period for every glucose test.

If both the relevant date, time and relevant period are present, we choose the relevant date time. If only the relevant period is specified, then the starting point of that period is used. Again, otherwise all of the results of earliest of are sorted and then the last one is chosen.

All right, and moving into the Denominator because the Denominator equals the Initial Population, we can just call in the Initial Population definition rather than including all three definitions again.

For Denominator Exclusion, there have been several changes to the logic to better align with the measure intent. We are looking for a glucose result greater than or equal to a thousand milligrams per deciliter and if it was drawn within the first six hours of the start of the hospitalization, then the patient will be excluded from the Denominator. I'm sorry, within the seven hours of the, excuse me, was drawn within a seven-hour window of the hospitalization.

So, the top-level definition calls another definition in initial glucose greater than or equal to 1,000 within one hour prior to and six hours after Encounter start, which is also displayed here. And so, I want to go into this logic in detail here in the next slide.

These two highlighted lines of logic is a Frequently Asked Question. And so, we did want to spend a little bit more time reviewing these examples. The first one here, the Glucose Greater Than or Equal to 1,000 Within One Hour Prior To and Six Hours After the Encounter Start looks for a glucose result greater than or equal to during a seven-hour interval. That's between the one hour prior to the Encounter and six hours after the Encounter start. The second definition, Glucose Tests Earlier Than

the Glucose Greater Than or Equal to 1,000 definition evaluates to see if there were any glucose tests performed earlier than the start of the seven-hour window.

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At a high level, what this logic aims to do is to constrain the glucose evaluation to only the glucose results performed during the qualifying Encounter within that seven-hour window. In the last version of the measure, if a patient met the Denominator Exclusion in an earlier hospital visit, the Exclusion was being applied to all subsequent Encounters. So therefore, this logic was added to resolve this issue. And so, let's take a look at a few examples to better understand.

Here in this slide, these examples, in the next coming slides, these examples are based on an Encounter that starts on 7/20 at 9:00 a.m.. And so, the seven-hour window to evaluate for the initial glucose greater than or equal to 1,000 begins one hour prior to the Encounter, so that's 8:00 a.m., to six hours after the Encounter start at 3:00 p.m.. This example one has three glucose tests completed within the seven-hour window and since the first glucose test in the window is 1,000 milligrams at 8:00 a.m., this test case does meet the Exclusion.

Here in example two, this does not meet the Exclusion because although the glucose test one is greater than or equal to 1,000 milligrams, it is not within the seven-hour window. It is one minute before. Albeit one minute, the logic does look to that small discreetness of the logic. Although glucose test two is in the initial glucose test with result within the seven-hour window, it is not greater than or equal to 1,000 milligrams per deciliter. So again, in this example, these cases do not meet the Exclusion.

In example three, this test case does not meet the Exclusion because glucose test one is the initial test with results within the window but again does not meet the 1,000 per milligram threshold. Although glucose test two is greater than 1,000 milligrams per deciliter, it is not the initial test with the result within the window as glucose test one is the initial test. So again, this test case does not meet the Exclusion.

Now in this last example, we illustrate the issue of the constraining that I had mentioned where the glucose was being applied, the Denominator Exclusion was being applied to subsequent Encounters. Now again with this logic revision, the Encounter is evaluated independently. So here in Encounter one on 7/20, this meets the Exclusion since the initial glucose test is within the window and is greater than or equal to 1,000 and Encounter two for the same patient on 8/2, this does not meet the Exclusion since it does not meet the criteria nor will Encounter one qualify into Encounter two. So again, this only returns one Denominator Exclusion Encounter in Encounter one.

Let's move on to the Numerator. No changes were made to this logic as the Numerator will be met if the Encounter has at least one Hyperglycemic Events within the first 10 days of the Encounter. The Hyperglycemic Events can be met in two different ways; a day where there is a glucose lab test with a result greater than 300 or a day where there is no glucose lab test with result and is preceded by two consecutive days where at least one glucose value during each of those two days was greater than or equal to 200. So, let's break this down.

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These two definitions, days with Hyperglycemic Events and days with glucose results, impact both the Numerator and both Measure Observations. In short, they identify three things: one, the hospitalization timeframe. Two, all days with glucose results greater than or equal to 200 and….greater than….300. And three, all days with a qualifying Severe Hyperglycemic Events.

And before we dive into the Numerator criteria, I want to show you this example that explains how the logic defines this hospitalization timeframe.

So, days in hospitalization definition as a whole defines the hospitalization timeframe that is eligible for the measure evaluation. The Numerator is looking for Hyperglycemic Events days within the first 10 days of the Encounter minus the first 24-hour period and minus the last period before discharge if it is less than 24 hours. It then labels each day in that hospitalization for ease of reference when identifying which day is considered a Hyperglycemic Events day.

So, to identify what days are included and excluded in the hospitalization period, we use three functions. The first is hospital days max 10. Days in period and interval to days numbers. So, the easiest way to understand is by applying them to this example shown here.

In the example, if a patient is admitted on 7/20, 9.00 a.m., and discharged on 8/2, 10:00 a.m., in fact, there are about 13 days in the hospitalization. The hospital days max 10 function shortens that hospitalization to the first 10 days of that Encounter. Meaning everything past that 10-day mark is excluded from the measure evaluation.

The interval to day numbers function simply numbers each day in the hospital. So, there is a slight typo here on the slide where it says day index, it is actually called day number. So again, it labels each day in the hospital period as just day number one, day number two, day number three, so on and so forth through the 10 days. Now in the days in period function, this dictates how to account for a day. So here each day is a 24-hour interval, not a calendar day, which means because this Encounter started at 9:00 a.m., the 24-hour interval ends at 8:59 a.m. the following day. Likewise, if the Encounter started at 1:00 p.m., then the 24-hour interval ends at 12:59 p.m. the following day.

There are two additional considerations for the start and end periods I mentioned earlier. The first is the first 24 hours or day one is excluded from being eligible as a Hyperglycemic Events day. And the second is if the last day of the hospital period is less than 24 hours, then it is excluded from the hospital period. So, in this example, if the patient was discharged on day number five at 11:00 a.m., then day five would not be included in the hospitalization period because day five did not meet the full 24-hour period criteria. So, the hospitalization would be day number one to day number four.

All right, so now that we have the hospitalization timeframe, let's jump back to the first Numerator criteria which looks for a day with a glucose result greater than 300 milligrams per deciliter, which if present is a Severe result.

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So, in this example you can see there are two days with Severe results; day number one and day number three. However, in the hospitalization period, because it excludes the first 24 hours from the valuation, this will always be day number one. So, although it has a Severe result, it does not count

as an event day. The reason for this is to account for when a patient comes into the hospital with a glucose already uncontrolled, which would not be considered a Hospital Harm event.

So now the only other Severe results occur on day number three, which is an eligible day and therefore is considered a Hyperglycemic Events day, which we noted here as true.

All right, so looking at the second criteria where we are looking for a day with no glucose results that was also preceded by two elevated result days and an elevated result is greater than or equal to 200. So again, using an example to explain this logic, we first look for days with no results. You can see there are four days with no results. Now for each of those days, are there two consecutive days that occur with a result greater than or equal to 200? Day number eight is the only day where there are two preceding days, right? So, day six and day seven precede and both have an elevated glucose result greater than 200. And because day number eight is an eligible day in the hospitalization, it is also considered a Hyperglycemic Events day. This is considered an event because glucose monitoring should have been continued based on the two days with consecutive elevated results.

Now before we get into the Measure Observations, I just want to take a further minute to explain what a Measure Observation is and how it works. The Measure Observation is how we calculate the top and bottom numbers of the ratio. So, for the top number, we take the Numerator population, apply the Measure Observation logic to get the total number of Hyperglycemic Events days across those Numerator Encounters. For this measure, it's important to note that regardless of how many Hyper events occur during the Encounter, it will only count towards one Numerator. However, when the Measure Observation is applied, the Measure Observation will count the number of events, Hyperglycemic Events, for that Encounter.

And for the bottom number, we look at the Denominator population, apply the Measure Observation to get the total number of eligible days for each Denominator Encounter.

As mentioned earlier, the intent for the Measure Observations did not change but we updated Denominator observation function to return zero to accommodate that processing issue to ensure only Encounters in the Denominator are being evaluated.

So therefore, Measure Observation one looks at all Encounters that meet the Denominator criteria and then counts all the eligible days within that Encounter. What defines an eligible day is the same criteria that determines the hospitalization timeframe that we reviewed in the days in hospitalization, so let's take a look at that example.

Again, the first 24 hours are not eligible, and the hospitalization is maxed out at 10 days. And each day has to meet that 24-hour interval to be included in that hospitalization.

Again, this Tuple is used, and remember that correlates all the eligible days into the list, so my list of eligible days for this Encounter are day number two through day number 10. And because the first 24-hour hours is not eligible, the maximum amount of eligible days will always be nine. So, the Denominator function leverages this pre-correlated information that is collected on the Initial Population and counts the number of eligible days in that list. So, in this example, there are nine days in Measure Observation one.

Similarly, updates to the Measure Observation one, we revise the Numerator Measure Observation function to return zero to accommodate that same processing issue to ensure that only Encounters in the Numerator are evaluated for the Numerator.

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The Measure Observation two looks for the total number of Hyperglycemic Events days across each Numerator Encounter.

And this example identifies all of the Hyperglycemic Events that occurred. Again, that Tuple correlates all the events per Encounter into a list, and the Measure Observation two counts all those events listed. So, the list from this Encounter shows Hyperglycemic Events on day number three and day number eight. Therefore, there are two days in Measure Observation two.

And that takes us to the end of the logic review for the Severe Hyperglycemia. Next, let's talk about this companion measure, Hospital Harm, Severe Hypoglycemia.

This measure is the Hospital Harm event, Severe Hypoglycemia, that causes patients to experience distressing symptoms ranging from confusion to coma and is also associated with increased odds of in-hospital mortality. The Hyperglycemia events in the hospital are among the most common adverse drug events. In a recent study published by the Office of Inspector General, adverse drug events represent 1/3 of all adverse events in the hospitals among Medicare patients. Of those events, Hypoglycemia represented the third most common adverse drug event. Rates of inpatient Hypoglycemia events are considered an indicator of the quality of care provided by a hospital. Severe Hypoglycemia events are largely avoidable by careful use of hypoglycemic medications. Moreover, the rate of Severe Hypoglycemia varies across hospitals indicating an opportunity for improvement in care. The goal of this measure is to improve safety for in-patients at risk for Severe Hypoglycemia and to provide a means for hospitals to track and trend performance to drive implementation of best practices to lower their rates of Hospital Harms caused by Severe Hypoglycemia.

The measure reads the number of inpatient hospitalizations for patients age 18 and older who are administered at least one hypoglycemic medication during the Encounter who suffer the harm of a Severe Hypoglycemic Event during the Encounter. Again, the Denominator in Initial Population are equal and patients must be 18 years of age or older at the start of the inpatient stay to be included and they must have been administered at least one hypoglycemic medication during the Encounter.

The Numerator is inpatient hospitalizations where a Severe Hypoglycemic Event occurred during that Encounter and the hypoglycemic event is defined as a glucose result less than 40 milligrams per deciliter and a hypoglycemic medication administered within 24 hours prior to the start of the Severe Hypoglycemic Event and no subsequent repeat test for the glucose result with a greater than 80 milligrams per deciliter within five minutes of the time of the initial glucose test, within the results of less than 40 milligrams per deciliter.

The 24 hour and five-minute timeframes are based on the time the glucose was drawn as this reflects the time the patient was experiencing that the specific glucose level.

One qualifying Severe Hypoglycemic Event is counted in the Numerator and only one Severe Hypoglycemic Event is counted per Encounter. No changes were made to the Numerator intent.

Changes to the Numerator was to revise the narrative to better align with the measure and logic intent where only one qualifying Severe Hypoglycemic Event is counted in the Numerator. The Numerator logic definition was simplified to improve readability and data processing and again, will be reviewed later in the presentation.

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It's jumping into the measure flows. The Initial Population main definition is Encountered with hypoglycemic medication administration. Three conditions must be met to qualify for this definition and these are called out by those three arrows. An Inpatient Encounter must be present, the patient must be greater than or equal to 18 years of age and there must be an administration of a medication from the Severe Hypoglycemia value set during the hospitalization Encounter.

If the criteria is met, the patient is in Initial Population, if not, the patient falls out of the population and the processing ends. Note that the Denominator equals Initial Population.

For the Numerator Encounter with Severe Hyperglycemic Events, again, three conditions must be met to qualify for this condition, and these are called out by the three red arrows. So, a laboratory test for glucose with a result less than 40 during the hospitalization. A medication from the hypoglycemics value set administered 24 hours or less on or before the glucose of less than 40. And no repeat test for glucose result greater than 80 within five minutes of the time of the glucose test with result less than 40.

If this criteria is met, the Encounter is in the Numerator. If not, Encounter is not in Numerator.

Now that Numerator and Denominator are defined, we plug those quantities into the sample calculation and the performance rate aggregates the populations into single performance rate for reporting purposes. In this example, Numerator is divided by Denominator to get that sample performance rate of 25%.

All right, so let's move into the logic review. The only change made to the Initial Population logic was to again constrain the age of 18 to the start of the inpatient Encounter as discussed previously. And we are looking for the administration of hypoglycemic medication given to the patient during that hospitalization. And because the Denominator equals Initial Population, we use the Initial Population definition to define the Denominator. No changes were made to the Numerator intent, which is to identify Encounters with a Severe Hypoglycemic Event which is defined here. The Numerator logic definitions, however, were revised to address readability and to ensure all glucose tests are constrained to the qualifying Encounter and to decrease data processing performance issues by restricting the evaluation to only the pertinent data elements. So, the intent remains the same, to capture Encounters with a Severe Hypoglycemic Event. Now I do want to break down the Numerator definitions Encounter with Severe Hypoglycemic Event logic where it includes the Severe hypoglycemic harm event.

Now the Severe Hypoglycemic Event defined statement is made up of two additional definitions. This is best described in an example. So, the two highlighted definitions, Glucose

Tests with Result Less Than 40 and Low Glucose Tests Followed by Glucose Tests Results Greater Than 80. And in the next slide I will show, this in an example, but as a high level, the glucose test with the results less than 40, this evaluates for glucose tests with a result less than 40 and occurs 24 hours or less after a hypoglycemic medication is administered. The low glucose tests followed by glucose tests result, that is looking for a repeat glucose test that would signify that the low glucose level may have been due to an error. So clinically speaking, if the patient is alert and the nurse takes a reading, but the glucometer reads a glucose less than 40, the nurse would likely repeat the test to make sure it was correct. So, we don't want to count an erroneous reading as a Numerator event. So therefore, the definition; low glucose test followed by glucose test result greater than 80 evaluates if a repeat test was done within five minutes with a result greater than 80.

01:05:04

If so, it does not count as a Numerator. If less than 80, it will count towards Numerator.

So now the definition Severe Hyperglycemic of Harm Event returns all glucose tests with a result less than 40 and all glucose tests with a result greater than 80 within five minutes. And this is where the attribute .ID comes into play. The .ID is an attribute for the laboratory test performed and is used to identify a specific unique instance of that lab test. So, each lab test in the system is associated to a specific ID and this allows the logic to differentiate between one test from another. So here the logic compares the IDs of those lab tests to determine which glucose tests meet as a Severe Hyperglycemic Events.

All right, so here's that example I promised. Looking at those two definitions and using this example where the Numerator is met. There are four glucose tests performed during the Encounter. Of those, there are three tests less than 40; glucose test one, glucose test two and glucose test four. And although glucose test two has a result of 37, it is followed by a glucose test with a result of greater than 80 within five minutes. So, note, 3:00 p.m. is the 37 milligram per deciliter and 3:05 p.m. is a repeat test of 85 milligrams per deciliter. So, this is not considered a Severe Hypoglycemic Event. Now looking at glucose one and four, neither of these tests were followed by a repeat test within five minutes. So, this indicates that these are two true hypoglycemic events.

Again, note that although there were two separate hypoglycemic events during the Encounter, this only counts as one Numerator event. And that takes us to the end of the presentation. I thank you for your time and attention. Susan, back to you.

Great, thanks Mia for your presentation. We've included an additional resource slide here to direct our audience to the eCQI Resource Center, Eligible Hospital measures page. Teach Me Clinical Quality Language Video Series including shorts on several Clinical Quality Language concepts that are listed on this slide. The Pioneers in Quality landing page on The Joint Commission website. The Expert to Expert Webinar Series landing page and the ONC Issue Tracking System. This is where clinical and technical questions about these eCQMs should be submitted following this webinar. Next slide, please.

So just a quick reminder, we're going to move into our live Q&A segment. Please submit your questions using the question pane. Click on the question mark icon in the audience toolbar, a panel will open for you to type and submit your questions. Include the slide reference number if you can or which measure that you are referring to. And then all questions that are not answered verbally during

this live broadcast will be addressed in a written follow up Q&A document that we will post on The Joint Commission website. And that follow up document will be posted, and we'll provide that link in a future slide.

So, I will stop talking here, Susan and Melissa, when you're ready, feel free to start the Q&A segment. And Mia, I will take over the screen sharing, thanks. Thanks Susan.

01:09:14

The first question, "Anything about coding of the disease characteristics of these diagnoses would be beneficial?" Answer, clinical codes, example given, ICD10-CM, ICD10-PCS, SNOWMED, LOINC, RxNorm, et cetera, are used to define certain data elements used in the measures. These can be found in the value sets listed in the measure specifications. We are not in the position to provide information on disease characteristics of Hypo or Hyperglycemia diagnoses. Susan Yendro, if you're speaking, you might be muted. Melissa, I think Susan might be having a quick microphone issue. Could you go on with the next question perhaps? Sure.

The next question is, "What is Hypoglycemia?" Hypoglycemia is an abnormally low level of glucose and Severe Hypoglycemia in the Hospital Harm Hypo measure is defined as a glucose level less than 40 milligrams per deciliter. I'll continue on with the next one if, Susan? Melissa, please do. I'm reaching out to her right now, thanks. That will be helpful.

Great, third question, "Can you comment on when this might be a required measure? Also, how many hospitals have submitted on this measure so far last year?" Answer, a hospital may choose to submit either measure as one of the three self-selected eCQMs for four quarters of calendar year 2023 data to meet the eCQM reporting requirements for the hospital IQR and Medicare promoting and interoperability programs. CMS evaluates these measures on an annual basis to determine if submission is voluntary or mandatory. We refer you to CMS's hospital inpatient quality reporting program website for more information. Since these measures were introduced beginning with 2023 reporting, information on number of hospitals reporting the measures and their performance rates will not become available until at least 2024.

Fourth question, changes to 2024 for Hospital Harm eCQM. Answer, if this question is referring to future updates to the measures in 2024 and it would depend on specific changes to Hypo/Hyperglycemia management guidelines by the Endocrine Society American Diabetes Association.

Next question, "How do the eCQM measures tie into future glucometric efforts via the National Healthcare Safety Network?" Answer, CDC's National Healthcare Safety Network is working on a surveillance Hypoglycemia measure to establish an EHR neutral standard for submitting inpatient medication related Hypoglycemia data electronically to CDC's NHSN and the HH-hypo measure is one of the five metrics NHSN is monitoring as they continue with their measure development. We will continue observing the unfolding of their work and determine if harmonization would be warranted. Melissa, we're going to try and see if we can get Susan Yendro's microphone to work. Susan, can you try to answer the next one? Can you hear me? We can hear you now, thank you. Oh, okay.

All righty, let me find the next question here. Okay, "What are the targets to aim for? We are aiming to be as low as possible?" The answer is the outcome of these measures is identification of inpatient

hospital events that are considered harmful. I'm sorry, I lost the answer there. Melissa, if you want to go ahead and take the next one, I'll catch up. Sorry, lost my place.

One moment. "Is diagnosis of DKA an exemption from the data?" Answer, a diagnosis of DKA is not exempted from the data. The Severe Hyperglycemia measure as specified excludes Hyperglycemic Events that occur in the first 24 hours since patient arrival allowing for correction of a high glucose that was a present on admission. Clinical practice guidelines support an assertion that 24 hours is a sufficient time to lower glucose level below 300 milligrams per deciliter, even among patients with DKA. Thank you.

01:15:20

Okay, next question, "Is CMS looking at possible Exclusions for Hypoglycemia events in patients who have received GPL-1 antagonist prior to admission?" And the answer is, thank you for the feedback for consideration. We do not currently exclude Encounters where patients receive medications that help lower blood glucose levels such as GLP-1 antagonist prior to admission. The intent of the Severe Hypoglycemia measure is to capture any Severe Hypoglycemic Event that occurs following a hypoglycemic medication that is administered during the inpatient Encounter. In order for the event to be considered as an adverse event, harm that can be attributed to the hospital. Thank you.

Next question, "Please share any benchmarks you have for this measure." Benchmarks are established using historical measure performance data. Since these measures were introduced beginning with 2023 reporting, performance rates and benchmarks from CMS will not become available until at least 2024.

Okay, the next question. "The mapping for these measures seems pretty straightforward. Is there anything in particular we should be watching out for?" So, the answer is it may be helpful to know that regarding glucose results in the data, a value of zero milligrams per deciliter is considered a valid reading when evaluating a glucose result. A null value or a value of negative are not valid readings and will not be evaluated.

I think I found the answer for the one about targets. So, forgive me if this is a repeat. "What targets are we to aim for? Are we simply aiming to be as low as possible?" And the answer the outcome of this measure or these measures is identification of inpatient hospital events that are considered harms to the patient. Therefore, aiming to keep the measure score as low as possible is the intent. Thank you.

Okay, the next question is asking, "Will Hypoglycemia following Hyperkalemia treatment using IV insulin push be counted for the result less than 40?" So, the answer is, a Severe Hypoglycemic Event is a glucose result of less than 40 that occurs within 24 hours of administration of a hypoglycemic medication such as insulin. The reason for administering the hypoglycemic medication such as to treat Hyperkalemia is not considered in the evaluation. A hypoglycemic event, regardless of the patient's diagnosis, is considered harm. Great, thanks.

The next question, I don't see the Excel option in the attachments. I have HTML and zip file. So, I'm guessing this is for the eCQI Resource Center. When navigating from the orange box labeled Eligible Hospital/Critical Access Hospital eCQMs in the eCQI Resource Center, locate the measure that you're interested in and see the orange button pointed down to like a bottom of the box. It's under

download specifications. Within that download, the technical release notes, which is in an Excel file, should be included in that download. There is another way to get there. When navigating from the dropdown boxes that are located below those initial three orange boxes on the eCQI Resource Center, select EH under eCQM and the period year you're interested in, then click the Find an eCQM button, click on the Hyperlink to the left of the measure that you're interested in, and then click on Specifications and Data Elements tab at the top. The Excel file, the TRN Excel file should be the third document listed there. So, there are a couple of ways to get there, and these instructions will also be available with the other questions that come out.

01:20:09

Okay And here's another question about the UMLS account or API key to log in and where do I find that? So, the answer is that anyone can obtain a log in into VSAC. An account may be obtained through the UMLS terminology services or UTS. You can sign up for that via the NLM website, which we will provide you that link, and your UTS account provides access to the Unified Medical Language System or UMLS, the Value Set Authority Center or the VSAC, RxNorm downloads and SNOWMED, CT downloads plus more. Thanks.

Next question, "With the Denominator Exclusion of initial glucose with result greater than or equal to 1,000, anytime between one hour prior to six hours after, question, initial glucose means that the first glucose that was done within that timeframe, if first glucose is 600 and subsequent glucose is within timeframe, 1200, the case is not excluded, right?" That is correct. Since the first glucose within the timeframe is only 600, the case is not excluded.

Okay, this next question, "Will days when the patient is on observation status be included in the Numerator and Denominator?" And the answer is that observation days will be counted if the transition between the end of the observation stay and the start of the inpatient Encounter is within one hour or less of each other.

Okay, next question. "So if patients don't get admitted, are they not included in the measure?" The answer is correct. An inpatient Encounter is a requirement for the Initial Population.

So, this next question asks, "Did I understand the slide correctly that patient days in the Denominator only include days with glucose readings?" And the answer is that the Denominator Measure Observation is the total number of days of the inpatient hospitalization which match the inpatient population or Denominator criteria and did not meet the Denominator Exclusion criteria. It does not include only those days with glucose readings.

Okay, this next question is, "I see specs mention glucose result date time but the presentation is stating draw time." The answer is that glucose lab results are based on the draw time such as when the test was performed, not the result time.

Okay, the next question, "So if diabetes diagnosis occurs on day three, does the Encounter start then on day three since they did not meet the criteria prior to day three? So, the answer is that all Encounters will start at the first day when the diabetes diagnosis occurs during the Encounter.

Okay, "Can you clarify if more than one event per Encounter is counted as one or two in the Numerator?" The answer is for Hypoglycemia, only one qualifying Severe Hypoglycemia event is

counted in the Numerator even if there are multiple events. For Hyperglycemia, all Severe Hyperglycemia events will be counted in the Numerator Measure Observation.

Okay, the next question asks, "The glucose value evaluated is the result performed by the lab, not the result performed at the bedside using a glucometer, correct?" And the answer is that the specimen source for the glucose test is blood, serum, plasma or interstitial fluid and can be obtained by a laboratory test, a point of care or POC test which includes bedside glucometers or a continuous glucometer monitor or CGM.

01:25:02

Thanks, the next question, "Does the seven-hour window include time spent in the emergency department if a patient is subsequently admitted as inpatient?" The answer is that the seven-hour window will time in the emergency department if the time between the end of the emergency department visit and the start of the inpatient admission is less than one hour or up to one hour. Okay, all right, we're going to take one last question as our time is coming to an end.

"So, for 2024 measures using a CGM at the bedside is a new appropriate practice for inpatient testing?" So, the answer is that we are not advocating that practices are appropriate but glucose readings from a CGM device are acceptable in the measure calculations.

So, thank you and thank you to everyone for all of your really great questions and we'll now turn it over to Susan Funk to close out the webinar. Thank you.

01:26:12

Excellent. Thank you Melissa and Susan for facilitating the Q&A segment and thanks to the team in the background that answered so many of them. Just a quick note here, we'll post the responses to any of the questions we didn't address during the live broadcast via a written document that will be posted. You'll be able to find it at the link on this slide. When available, all Expert to Expert recording links, slides, transcripts, and these Q&A documents can be accessed for previous and on-demand webinars on The Joint Commission's webpage at the link shown on the slide. Real quick to give a plug for the remaining webinars that we have in the eCQM Annual Update Series, we began with an on-demand webinar that was released in August on Joint Commission's PC-01, 05 and 06 eCQMs. We continued with the PC measures in September, Stroke in October, VTE in November, and today's Glycemia eCQMs. The annual update series will conclude in January with the Safe Use of Opioids Concurrent Prescribing eCQM. And then in January and February of 2024, we will also address the new measures for 2024 implementation. This series incorporates experts from The Joint Commission, CMS, Mathematica and other Measure Stewards. If you missed any of these topics, the link on this slide will provide you access to the slides and the recordings when they're available. And the registration links for the future webinars can also be found on that page.

Before the session concludes, a few words about the CE survey. We use your feedback to inform future content and assess the quality of our educational programs. You can access the survey in two ways. On the next slide, we provide a QR code that you can scan with your mobile device to immediately access the survey. If you miss that QR code, tomorrow, the link will be provided within an automated email sent to the email address that you used to register. To obtain your CE certificate, at the end of the survey, when you click Submit, you are redirected to a page from which you can

print or download your certificate. And after completing the survey, you will also receive an automated email that includes that link to the certificate.

So, with that said, thank you to Mia for your presentation, Susan and Melissa for facilitating the Q&A segment and to our content experts that were in the background answering all of the submitted questions. Finally, thanks to all of our attendees today for coming and participating in today's broadcast. Have a great day. I will just leave this slide up for a few moments for people to scan the QR code.