

 MEASURE DETAILS

MEDIAN TIME TO PAIN MEDICATION FOR PATIENTS WITH A DIAGNOSIS OF SICKLE CELL DISEASE (SCD) WITH VASO-OCCLUSIVE EPISODE (VOE)

Episode of Care Based Measure

Median time (in minutes) from ED arrival to initial administration of pain medication for all patients, regardless of age, with a principal encounter diagnosis of SCD with VOE

SHOW ALL RESULTS

Initial Population, Measure Population:


```
define "Initial Population":
  "ED Encounter for SCD with VOE with Pain Medication Administered" EDEncounter
  where EDEncounter.relevantPeriod starts during "Measurement Period"
```

SHOW RESULT

Measure Observation:


```
define function "NumberOfMinutesBetweenEDArrivalAndFirstPainMedicationAdministration"
(EDEncounterForSCDwVOE "Encounter, Performed" ):
  duration in minutes of Interval[Global."EmergencyDepartmentArrivalTime" ( EDEncounterForSCDwVOE
), start of Global."NormalizeInterval" ( "FirstPainMedicationAdministration"
(EDEncounterForSCDwVOE).relevantDatetime, "FirstPainMedicationAdministration"
(EDEncounterForSCDwVOE).relevantPeriod )]
```

Definitions:


```
define "ED Encounter with Principal Diagnosis of SCD with VOE":
  ["Encounter, Performed": "Emergency Department Evaluation and Management Visit"] EDEncounter
  with EDEncounter.diagnoses EncounterDiagnosis
  such that EncounterDiagnosis.code in "Sickle Cell Disease with Vaso Occlusive Episode"
  and EncounterDiagnosis.rank = 1
```

SHOW RESULT

```

define "ED Encounter for SCD with VOE with Pain Medication Administered":
  "ED Encounter with Principal Diagnosis of SCD with VOE" SCDwVOEEncounter
  with ["Medication, Administered": "Analgesics for Acute Pain"] PainMed
  such that start of Global.NormalizeInterval ( PainMed.relevantDatetime,
PainMed.relevantPeriod ) during SCDwVOEEncounter.relevantPeriod

```

SHOW RESULT

Functions:

```

/*@description: Returns an interval of date values extracted from the input interval of date-time
values
@comment: This function returns an interval constructed using the `date from` extractor on the
start
and end values of the input date-time interval. Note that using a precision specifier as part of a
timing phrase is preferred to communicate intent to perform day-level comparison, as well as for
general readability.*/
define function "ToDateInterval"(period Interval<DateTime> ):
  Interval[date from start of period, date from end of period]

```

```

/*calculates the difference in calendar days between the start and end of the given interval.*/
define function "LengthInDays"(Value Interval<DateTime> ):
  difference in days between start of Value and end of Value

```

```

/*returns list of all locations within an encounter, including locations for immediately prior ED
visit.*/
define function "HospitalizationLocations"(Encounter "Encounter, Performed" ):
  Encounter Visit
  let EDVisit: Last(["Encounter, Performed": "Emergency Department Visit"] LastED
    where LastED.relevantPeriod ends 1 hour or less on or before start of Visit.relevantPeriod
    sort by
    end of relevantPeriod
  )
  return if EDVisit is null then Visit.facilityLocations
    else flatten { EDVisit.facilityLocations, Visit.facilityLocations }

```

```

/*Returns the arrival time in the ED for the encounter.*/
define function "EmergencyDepartmentArrivalTime"(Encounter "Encounter, Performed" ):
  start of First(("HospitalizationLocations"(Encounter))HospitalLocation
    where HospitalLocation.code in "Emergency Department Visit"
    sort by start of locationPeriod
  ).locationPeriod

```

```
/*Hospitalization returns the total interval for admission to discharge for the given encounter, or
for the admission of any immediately prior emergency department visit to the discharge of the given
encounter.*/
define function "Hospitalization"(Encounter "Encounter, Performed" ):
  Encounter Visit
  let EDVisit: Last(["Encounter, Performed": "Emergency Department Visit"] LastED
    where LastED.relevantPeriod ends 1 hour or less on or before start of Visit.relevantPeriod
    sort by
    end of relevantPeriod
  )
  return Interval[Coalesce(start of EDVisit.relevantPeriod, start of Visit.relevantPeriod),
  end of Visit.relevantPeriod]
```

```
/*Returns admission time for an encounter or for immediately prior emergency department visit.*/
define function "HospitalAdmissionTime"(Encounter "Encounter, Performed" ):
  start of "Hospitalization"(Encounter)
```

```
/*Returns earliest arrival time for an encounter including any prior ED visit.*/
define function "HospitalArrivalTime"(Encounter "Encounter, Performed" ):
  start of First("HospitalizationLocations"(Encounter))HospitalLocation
    sort by start of locationPeriod
  ).locationPeriod
```

```
/*Returns the length of stay in days (i.e. the number of days between admission and discharge) for
the given encounter, or from the admission of any immediately prior emergency department visit to
the discharge of the encounter*/
define function "HospitalizationLengthofStay"(Encounter "Encounter, Performed" ):
  LengthInDays("Hospitalization"(Encounter))
```

```
/*Returns the latest departure time for encounter including any prior ED visit.*/
define function "HospitalDepartureTime"(Encounter "Encounter, Performed" ):
  end of Last(("HospitalizationLocations"(Encounter))HospitalLocation
    sort by start of locationPeriod
  ).locationPeriod
```

```
/*Hospital Discharge Time returns the discharge time for an encounter*/
define function "HospitalDischargeTime"(Encounter "Encounter, Performed" ):
  end of Encounter.relevantPeriod
```

```

/*Hospitalization with Observation and Outpatient Surgery Service returns the total interval from
the start of any immediately prior emergency department visit, outpatient surgery visit or
observation visit to the discharge of the given encounter.*/
define function "HospitalizationWithObservationAndOutpatientSurgeryService"(Encounter "Encounter,
Performed" ):
  Encounter Visit
    let ObsVisit: Last(["Encounter, Performed": "Observation Services"] LastObs
      where LastObs.relevantPeriod ends 1 hour or less on or before start of Visit.relevantPeriod
      sort by
      end of relevantPeriod
    ),
    VisitStart: Coalesce(start of ObsVisit.relevantPeriod, start of Visit.relevantPeriod),
    EDVisit: Last(["Encounter, Performed": "Emergency Department Visit"] LastED
      where LastED.relevantPeriod ends 1 hour or less on or before VisitStart
      sort by
      end of relevantPeriod
    ),
    VisitStartWithED: Coalesce(start of EDVisit.relevantPeriod, VisitStart),
    OutpatientSurgeryVisit: Last(["Encounter, Performed": "Outpatient Surgery Service"]
LastSurgeryOP
      where LastSurgeryOP.relevantPeriod ends 1 hour or less on or before VisitStartWithED
      sort by
      end of relevantPeriod
    )
  return Interval[Coalesce(start of OutpatientSurgeryVisit.relevantPeriod, VisitStartWithED),
end of Visit.relevantPeriod]

```

```

/*Hospitalization with Observation returns the total interval from the start of any immediately
prior emergency department visit through the observation visit to the discharge of the given
encounter*/
define function "HospitalizationWithObservation"(Encounter "Encounter, Performed" ):
  Encounter Visit
    let ObsVisit: Last(["Encounter, Performed": "Observation Services"] LastObs
      where LastObs.relevantPeriod ends 1 hour or less on or before start of Visit.relevantPeriod
      sort by
      end of relevantPeriod
    ),
    VisitStart: Coalesce(start of ObsVisit.relevantPeriod, start of Visit.relevantPeriod),
    EDVisit: Last(["Encounter, Performed": "Emergency Department Visit"] LastED
      where LastED.relevantPeriod ends 1 hour or less on or before VisitStart
      sort by
      end of relevantPeriod
    )
  return Interval[Coalesce(start of EDVisit.relevantPeriod, VisitStart),
end of Visit.relevantPeriod]

```

```

/*Hospitalization with Observation Length of Stay returns the length in days from the start of any
immediately prior emergency department visit through the observation visit to the discharge of the
given encounter*/
define function "HospitalizationWithObservationLengthofStay"(Encounter "Encounter, Performed" ):
  "LengthInDays"("HospitalizationWithObservation"(Encounter))

```

```
/*First Inpatient Intensive Care Unit returns the first intensive care unit for the given encounter, without considering any immediately prior emergency department visit.*/
define function "FirstInpatientIntensiveCareUnit"(Encounter "Encounter, Performed" ):
  First((Encounter.facilityLocations)HospitalLocation
    where HospitalLocation.code in "Intensive Care Unit"
    and HospitalLocation.locationPeriod during Encounter.relevantPeriod
    sort by start of locationPeriod
  )
```

```
/*Given a datetime and a period, returns the period (if a period is provided) or the interval beginning and ending on the datetime (if a datetime is provided)*/
define function "NormalizeInterval"(pointInTime DateTime, period Interval<DateTime> ):
  if pointInTime is not null then Interval[pointInTime, pointInTime]
  else if period is not null then period
  else null as Interval<DateTime>
```

```
/*Given an interval, return true if the interval has a starting boundary specified (i.e. the start of the interval is not null and not the minimum DateTime value)*/
define function "HasStart"(period Interval<DateTime> ):
  not ( start of period is null
    or start of period = minimum DateTime
  )
```

```
/*Given an interval, return true if the interval has an ending boundary specified (i.e. the end of the interval is not null and not the maximum DateTime value)*/
define function "HasEnd"(period Interval<DateTime> ):
  not (
    end of period is null
    or
    end of period = maximum DateTime
  )
```

```
/*Given an interval, return the ending point if the interval has an ending boundary specified, otherwise, return the starting point*/
define function "Latest"(period Interval<DateTime> ):
  if ( HasEnd(period)) then
    end of period
  else start of period
```

```
/*Given an interval, return the starting point if the interval has a starting boundary specified, otherwise, return the ending point*/
define function "Earliest"(period Interval<DateTime> ):
  if ( HasStart(period)) then start of period
  else
    end of period
```

```
/*Given a pointInTime or period, if the pointInTime is specified, returns the pointInTime, returns the ending point of the period if the period has an ending boundary specified, otherwise returns the starting point of the interval*/
define function "LatestOf"(pointInTime DateTime, period Interval<DateTime> ):
  Latest(NormalizeInterval(pointInTime, period))
```

```
/*Given a pointInTime or period, if the pointInTime is specified, returns the pointInTime, returns the starting point of the period if the period has a starting boundary specified, otherwise returns the ending point of the period*/
define function "EarliestOf"(pointInTime DateTime, period Interval<DateTime> ):
  Earliest(NormalizeInterval(pointInTime, period))
```

```
define function "FirstPainMedicationAdministration"(EDEncounterForSCDWVE "Encounter, Performed" ):
  First(["Medication, Administered": "Analgesics for Acute Pain"] PainMed
    where start of Global.NormalizeInterval(PainMed.relevantDatetime, PainMed.relevantPeriod)
during EDEncounterForSCDWVE.relevantPeriod
  sort by relevantDatetime
)
```

Unused Definitions:



TERMINOLOGY

Analgesics for Acute Pain

2.16.840.1.113762.1.4.1160.43

Draft

Emergency Department Evaluation and Management Visit

2.16.840.1.113883.3.464.1003.101.12.1010

Draft

Emergency Department Visit

2.16.840.1.113883.3.117.1.7.1.292

Draft

Encounter Inpatient

2.16.840.1.113883.3.666.5.307

Draft

Ethnicity

2.16.840.1.114222.4.11.837

Draft

Intensive Care Unit

2.16.840.1.113762.1.4.1029.206

Draft

ONC Administrative Sex

2.16.840.1.113762.1.4.1

Draft

Observation Services

2.16.840.1.113762.1.4.1111.143

Draft

Outpatient Surgery Service

2.16.840.1.113762.1.4.1110.38

Draft

Payer Type

2.16.840.1.114222.4.11.3591

Draft

Race

2.16.840.1.114222.4.11.836

Draft

Sickle Cell Disease with Vaso Occlusive Episode

2.16.840.1.113762.1.4.1160.42

Draft

OVERLAPPING VALUE SETS

Emergency Department Evaluation and Management Visit

2.16.840.1.113883.3.464.1003.101.12.1010

Emergency Department Visit

2.16.840.1.113883.3.117.1.7.1.292

1 code

Emergency Department Visit

2.16.840.1.113883.3.117.1.7.1.292

Emergency Department Evaluation and Management Visit

2.16.840.1.113883.3.464.1003.101.12.1010

1 code

TEST PATIENTS



PASS 20 /20



COVERAGE

- ✓ Abernande Adaine PASS >
- ✓ Applebees Kristen PASS >
- ✓ Baggins Debra (Debbie) PASS >
- ✓ Carmichael Veera PASS >
- ✓ Davenport Casey PASS >

✓  Everglow Zenith	PASS >
✓  Faeth Figeroth	PASS >
✓  Fakename Stacy	PASS >
✓  Frostblade Lucy	PASS >
✓  Gukgak Riz	PASS >
✓  Hawthorne George	PASS >
✓  Lewis Kingston	PASS >
✓  Lincolnshire Cornelius	PASS >
✓  Rocket Johnny	PASS >
✓  Seacaster Fabian Aramais	PASS >
✓  Thistlespring Gorgug	PASS >
✓  Trellington Dallas	PASS >
✓  Vernacular Paulie	PASS >
✓  Wachowski Nikolai	PASS >
✓  Yeung Neptune	PASS >