<table>
<thead>
<tr>
<th>Measure #</th>
<th>Measure Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECPR2</td>
<td>Door to Diagnostic Evaluation by a Provider – Emergency Department (ED) Patients</td>
</tr>
<tr>
<td>ECPR5</td>
<td>Mean Time from Emergency Department (ED) Arrival to ED Departure for Discharged Lower Acuity ED Patients</td>
</tr>
<tr>
<td>ECPR6</td>
<td>Mean Time from Emergency Department (ED) Arrival to ED Departure for Discharged Higher Acuity ED Patients</td>
</tr>
<tr>
<td>ECPR11</td>
<td>Three Day All Cause Return ED Visit Rate</td>
</tr>
<tr>
<td>ECPR39</td>
<td>Avoid Head CT for Patients with Uncomplicated Syncope</td>
</tr>
<tr>
<td>ECPR40</td>
<td>Initiation of the Initial Sepsis Bundle</td>
</tr>
<tr>
<td>ACEP21</td>
<td>Coagulation Studies in Patients Presenting with Chest Pain with No Coagulopathy or Bleeding</td>
</tr>
<tr>
<td>ECPR44</td>
<td>Door to Diagnostic Evaluation by a Provider – Urgent Care Patients</td>
</tr>
<tr>
<td>ECPR41</td>
<td>Rh Status Evaluation and Treatment of Pregnant Women at Risk of Fetal Blood Exposure</td>
</tr>
<tr>
<td>ECPR42</td>
<td>Restrictive Use of Blood Transfusions</td>
</tr>
<tr>
<td>ECPR47</td>
<td>Avoidance of Opiate Prescriptions for Greater Than 3 Days Duration for Acute Pain</td>
</tr>
<tr>
<td>ECPR48</td>
<td>Avoidance of Long-Acting (LA) or Extended-Release (ER) Opiate Prescriptions</td>
</tr>
<tr>
<td>ECPR46</td>
<td>Avoidance of Opiate Prescriptions for Low Back Pain or Migraines</td>
</tr>
<tr>
<td>ECPR49</td>
<td>Avoidance of Tramadol or Codeine for Children</td>
</tr>
<tr>
<td>ECPR45</td>
<td>Avoidance of Creatine Kinase-MB (CK-MB) Testing for Non-traumatic Chest Pain</td>
</tr>
<tr>
<td>ECPR50</td>
<td>Appropriate Use of Telemetry for Admission or Observation Placement</td>
</tr>
</tbody>
</table>
**E-CPR (Emergency – Clinical Performance Registry) Measure #2**  
Adopted from 2018 CMS Hospital Outpatient Measure #20 (NQF #0498) Specifications

**Measure Title:** Door to Diagnostic Evaluation by a Provider – Emergency Department (ED) Patients

**Inverse Measure:** Yes

**Measure Description:** Mean Time from ED Arrival to Provider Contact for ED Patients Evaluated by the Eligible Professional

**National Quality Strategy Domain:** Patient Safety

**Type of Measure:** Outcome

**Reporting Measure:** Door to Diagnostic Evaluation by a Provider Observed/Expected Ratio

**Number of Performance Rates:** 3
1. Time (in minutes) from ED Arrival to Provider (MD/DO/PA/NP) Contact (Overall rate; composite score of performance rates 2 and 3 below)
2. Time (in minutes) from ED Arrival to Provider (MD/DO/PA/NP) Contact for Adult (≥ 18 years of age) ED Patients
3. Time (in minutes) from ED Arrival to Provider (MD/DO/PA/NP) Contact for Pediatric (< 18 years of age) ED Patients

**Measure Scoring:** Continuous

**Numerator:** Time (in minutes) from ED Arrival to Provider (MD/DO/PA/NP) Contact for ED Patients

- Definition of Arrival Time: The earliest documented time the patient arrived at the ED
- Definition of Provider Contact Time: The time of the first direct, personal exchange between an ED patient and the Eligible Professional

**Numerator Exclusions:** None

**Denominator:** Any Patient Evaluated by the Eligible Professional (MD/DO/PA/NP) in the ED (E/M Codes 99281-99285 & 99291-99292 AND Place of Service Indicator: 23)

**Denominator Exclusions:** None

**Risk Adjustment:** Yes

**Risk Adjustment:**
The purpose of the risk-adjustment is to determine the provider and system level contributions to the outcome after adjusting for patient-level demographic and clinical characteristics. Arrival to ED provider contact times are risk-adjusted as continuous variables after normalization.

**Risk-adjustment derivation:**
*Model:* A regression model with fixed-effects (patient age, sex, visit acuity, previous ED visits and presence of co-morbidities) as well as hospital-level effects (state and ED volume) is used. Normal distribution is ensured and then a linear regression performed.
To ensure that only valid data are included and risk-adjustment models are created with stable coefficients, non-normal data will be normalized through a two-step process: 1) the data will have a 90% truncation by dropping values below the 5th percentile or above the 95th percentile. 2) Based on a graphical exploration of possible transformations and a chi-square-goodness-of-fit assessment of the transformation for normality, an appropriate transformation (such as a logarithm, square root, etc) will be applied. After the predictions are created, the measure will be returned to its natural scale through reversing the transformation process (taking the exponent of the prediction that was derived from the logarithm of the dependent variable).

**Dataset:** The most current National Hospital Ambulatory Medical Care Survey (NHAMCS) dataset is utilized. The derivation dataset will be a 75% random sample of the relevant dataset. The co-morbidities are derived in the NHAMCS dataset by mapping the ICD9 and ICD10 diagnoses to the Charlson comorbidity index.

**Risk-adjustment validation:** The results of the risk-adjustment derivation are used as a model with the relative patient level factors and a beta-coefficient weight for each of those factors. These coefficients are applied to the 25% validation sample to evaluate the discriminant value (c-statistic) and calibration (Hosmer-Lemeshow) of the risk-adjustment model.

**Risk-adjustment application:** The coefficient weights from the risk-adjustment model are applied to the performance data to provide an expected outcome for each patient. For each provider, the observed outcome over the expected outcome is summed to produce an observed/expected ratio.

**Rationale:** (Adopted from 2017 CMS Hospital Outpatient Measure #20 Specifications)
Reducing the time patients remain in the emergency department (ED) can improve access to treatment and increase quality of care. Reducing this time potentially improves access to care specific to the patient condition and increases the capability to provide additional treatment. In recent times, EDs have experienced significant overcrowding. Although once only a problem in large, urban, teaching hospitals, the phenomenon has spread to other suburban and rural healthcare organizations. According to a 2002 national U.S. survey, more than 90 percent of large hospitals report EDs operating "at" or "over" capacity. Overcrowding and heavy emergency resource demand have led to a number of problems, including ambulance refusals, prolonged patient waiting times, increased suffering for those who wait, rushed and unpleasant treatment environments, and potentially poor patient outcomes. Approximately one third of hospitals in the U.S. report increases in ambulance diversion in a given year, whereas up to half report crowded conditions in the ED. In a recent national survey, 40 percent of hospital leaders viewed ED crowding as a symptom of workforce shortages. ED crowding may result in delays in the administration of medication such as antibiotics for pneumonia and has been associated with perceptions of compromised emergency care. For patients with non-ST-segment-elevation myocardial infarction, long ED stays were associated with decreased use of guideline-recommended therapies and a higher risk of recurrent myocardial infarction. When EDs are overwhelmed, their ability to respond to community emergencies and disasters may be compromised.

Measures that differentiate between sub-populations of patients such as Adult and Pediatric patients allow Eligible Professionals to better recognize when opportunities for improvement exist within these sub-populations and allow them to further drive improvements.

**Selected References:**
(Adopted from 2017 CMS Hospital Outpatient Measure #20 Specifications)


• Pines JM, et al. ED crowding is associated with variable perceptions of care compromise. *Acad Emerg Med*. 2007; 14:1176-81


**E-CPR (Emergency – Clinical Performance Registry) Measure #5**
Adopted from 2018 CMS Hospital Outpatient Measure #18 (NQF #0496) Specifications

**Measure Title:** Mean Time from Emergency Department (ED) Arrival to ED Departure for Discharged Lower Acuity ED Patients

**Inverse Measure:** Yes

**Measure Description:** Mean Time from ED Arrival to Time of Departure from the ED for Lower Acuity Patients Discharged from the ED

**National Quality Strategy Domain:** Person and Caregiver-Centered Experience and Outcomes

**Type of Measure:** Outcome

**Reporting Measure:** Time from ED arrival to time of departure from the ED observed/expected ratio

**Number of Performance Rates:** 1

**Measure Scoring:** Continuous

**Numerator:** Time (in minutes) from ED arrival to ED departure for Lower Acuity Patients Discharged from the ED
- Definition of Arrival Time: The earliest documented time the patient arrived at the ED
- Definition of Departure Time: The time the patient departed from the ED

**Numerator Exclusions:** None

**Denominator:**
- Any Lower Acuity Patient Evaluated by the Eligible Professional in the ED (E/M Codes 99281-99283 AND Place of Service Indicator: 23) PLUS
- Transferred, eloped or AMA patients are excluded

**Denominator Exclusions:** None

**Risk Adjustment:** Yes

**Risk Adjustment:**
The purpose of the risk-adjustment is to determine the provider and system level contributions to the outcome after adjusting for patient-level demographic and clinical characteristics. ED length of stay times are risk-adjusted as continuous variables after normalization.

**Risk-adjustment derivation:**
- Model: A regression model with fixed-effects (patient age, sex, visit acuity, previous ED visits and presence of co-morbidities) as well as hospital-level effects (state and ED volume) is used. Normal distribution is ensured and then a linear regression performed. To ensure that only valid data are included and risk-adjustment models are created with stable coefficients, non-normal data will be normalized through a two-step process: 1) the data will have a 90% truncation by dropping values below the 5th percentile or above
the 95th percentile. 2) Based on a graphical exploration of possible transformations and a chi-square-goodness-of-fit assessment of the transformation for normality, an appropriate transformation (such as a logarithm, square root, etc) will be applied. After the predictions are created, the measure will be returned to its natural scale through reversing the transformation process (taking the exponent of the prediction that was derived from the logarithm of the dependent variable).

Dataset: The most current National Hospital Ambulatory Medical Care Survey (NHAMCS) dataset is utilized. The derivation dataset will be a 75% random sample of the relevant dataset. The co-morbidities are derived in the NHAMCS dataset by mapping the ICD9 and ICD10 diagnoses to the Charleston comorbidity index.

Risk-adjustment validation: The results of the risk-adjustment derivation are used as a model with the relative patient level factors and a beta-coefficient weight for each of those factors. These coefficients are applied to the 25% validation sample to evaluate the discriminant value (c-statistic) and calibration (Hosmer-Lemeshow) of the risk-adjustment model.

Risk-adjustment application: The coefficient weights from the risk-adjustment model are applied to the performance data to provide an expected outcome for each patient. For each provider, the observed outcome over the expected outcome is summed to produce an observed/expected ratio.

Rationale: (Adopted from 2017 CMS Hospital Outpatient Measure #18 Specifications)

Reducing the time patients remain in the emergency department (ED) can improve access to treatment and increase quality of care. Reducing this time potentially improves access to care specific to the patient condition and increases the capability to provide additional treatment. In recent times, EDs have experienced significant overcrowding. Although once only a problem in large, urban, teaching hospitals, the phenomenon has spread to other suburban and rural healthcare organizations. According to a 2002 national U.S. survey, more than 90 percent of large hospitals report EDs operating "at" or "over" capacity. Overcrowding and heavy emergency resource demand have led to a number of problems, including ambulance refusals, prolonged patient waiting times, increased suffering for those who wait, rushed and unpleasant treatment environments, and potentially poor patient outcomes. Approximately one third of hospitals in the U.S. report increases in ambulance diversion in a given year, whereas up to half report crowded conditions in the ED. In a recent national survey, 40 percent of hospital leaders viewed ED crowding as a symptom of workforce shortages. ED crowding may result in delays in the administration of medication such as antibiotics for pneumonia and has been associated with perceptions of compromised emergency care. For patients with non-ST-segment-elevation myocardial infarction, long ED stays were associated with decreased use of guideline-recommended therapies and a higher risk of recurrent myocardial infarction. When EDs are overwhelmed, their ability to respond to community emergencies and disasters may be compromised.

Selected References:
(Adopted from 2017 CMS Hospital Outpatient Measure #18 Specifications)
- Derlet RW, Richards JR. Overcrowding in the nation's emergency departments: complex


Mean Time from Emergency Department (ED) Arrival to ED Departure for Discharged Higher Acuity ED Patients

Mean Time from ED Arrival to Time of Departure from the ED for Higher Acuity Patients Discharged from the ED

Person and Caregiver-Centered Experience and Outcomes

Outcome

Time from ED arrival to time of departure from the ED observed/expected ratio

1

Continuous

Time (in minutes) from ED arrival to ED departure for Higher Acuity Patients Discharged from the ED

• Definition of Arrival Time: The earliest documented time the patient arrived at the ED
• Definition of Departure Time: The time the patient departed from the ED

None

Any Higher Acuity Patient Evaluated by the Eligible Professional in the ED (E/M Codes 99284-99285 AND Place of Service Indicator: 23) PLUS

Transferred, eloped or AMA patients are excluded

None

Yes

The purpose of the risk-adjustment is to determine the provider and system level contributions to the outcome after adjusting for patient-level demographic and clinical characteristics. ED length of stay times are risk-adjusted as continuous variables after normalization.

Model: A regression model with fixed-effects (patient age, sex, visit acuity, previous ED visits and presence of co-morbidities) as well as hospital-level effects (state and ED volume) is used. Normal distribution is ensured and then a linear regression performed. To ensure that only valid data are included and risk-adjustment models are created with stable coefficients, non-normal data will be normalized through a two-step process: 1) the data will have a 90% truncation by dropping values below the 5th percentile or above
the 95th percentile. 2) Based on a graphical exploration of possible transformations and a chi-square-goodness-of-fit assessment of the transformation for normality, an appropriate transformation (such as a logarithm, square root, etc) will be applied. After the predictions are created, the measure will be returned to its natural scale through reversing the transformation process (taking the exponent of the prediction that was derived from the logarithm of the dependent variable).

Dataset: The most current National Hospital Ambulatory Medical Care Survey (NHAMCS) dataset is utilized. The derivation dataset will be a 75% random sample of the relevant dataset. The co-morbidities are derived in the NHAMCS dataset by mapping the ICD9 and ICD10 diagnoses to the Charleston comorbidity index.

Risk-adjustment validation: The results of the risk-adjustment derivation are used as a model with the relative patient level factors and a beta-coefficient weight for each of those factors. These coefficients are applied to the 25% validation sample to evaluate the discriminant value (c-statistic) and calibration (Hosmer-Lemeshow) of the risk-adjustment model.

Risk-adjustment application: The coefficient weights from the risk-adjustment model are applied to the performance data to provide an expected outcome for each patient. For each provider, the observed outcome over the expected outcome is summed to produce an observed/expected ratio.

Rationale: (Adopted from 2017 CMS Hospital Outpatient Measure #18 Specifications)
Reducing the time patients remain in the emergency department (ED) can improve access to treatment and increase quality of care. Reducing this time potentially improves access to care specific to the patient condition and increases the capability to provide additional treatment. In recent times, EDs have experienced significant overcrowding. Although once only a problem in large, urban, teaching hospitals, the phenomenon has spread to other suburban and rural healthcare organizations. According to a 2002 national U.S. survey, more than 90 percent of large hospitals report EDs operating "at" or "over" capacity. Overcrowding and heavy emergency resource demand have led to a number of problems, including ambulance refusals, prolonged patient waiting times, increased suffering for those who wait, rushed and unpleasant treatment environments, and potentially poor patient outcomes. Approximately one third of hospitals in the U.S. report increases in ambulance diversion in a given year, whereas up to half report crowded conditions in the ED. In a recent national survey, 40 percent of hospital leaders viewed ED crowding as a symptom of workforce shortages. ED crowding may result in delays in the administration of medication such as antibiotics for pneumonia and has been associated with perceptions of compromised emergency care. For patients with non-ST-segment-elevation myocardial infarction, long ED stays were associated with decreased use of guideline-recommended therapies and a higher risk of recurrent myocardial infarction. When EDs are overwhelmed, their ability to respond to community emergencies and disasters may be compromised.

Measures that differentiate between sub-populations of patients such as lower acuity and higher acuity patients allow Eligible Professionals to better recognize when opportunities for improvement exist within these sub-populations and allow them to further drive improvements.

Selected References:
(Adopted from 2017 CMS Hospital Outpatient Measure #18 Specifications)
- Diercks DB, et al. Prolonged emergency department stays of non-ST-segment-elevation myocardial infarction patients are associated with worse adherence to the American College of Cardiology/American Heart Association guidelines for management and

E-CPR (Emergency – Clinical Performance Registry) Measure #11
Adopted from numerous emergency departments and hospital systems across the United States

Measure Title: Three Day All Cause Return ED Visit Rate

Inverse Measure: Yes

Measure Description: Percentage of the Eligible Professional’s ED Discharged Patients that Returned to the Same Emergency Department (ED) within Three Calendar Days of Prior ED Visit Date of Service

National Quality Strategy Domain: Communication and Care Coordination

Type of Measure: Outcome

Reporting Measure: Three Day All Cause Return ED Visit Rate Observed/Expected Ratio

Number of Performance Rates: 3
1. Number of Eligible Professional’s ED Discharged Patients that Returned to the Same ED within Three Calendar Days of Prior ED Date of Service (Overall rate; composite score of performance rates 2 and 3 below)
2. Number of Eligible Professional’s Adult (≥ 18 years of age) ED Discharged Patients that Returned to the Same ED within Three Calendar Days of Prior ED Date of Service
3. Number of Eligible Professional’s Pediatric (< 18 years of age) ED Discharged Patients that Returned to the Same ED within Three Calendar Days of Prior ED Date of Service

Measure Scoring: Proportion

Numerator: Number of Eligible Professional’s ED Discharged Patients that Returned to the Same ED within Three Calendar Days of Prior ED Date of Service

Numerator Exclusions: None

Denominator:
- Any Patient Evaluated by the Eligible Professional in the ED (E/M Codes 99281-99285 & 99291-99292 AND Place of Service Indicator: 23) PLUS
- Transferred, eloped or AMA patients are excluded

Denominator Exclusions: None

Risk Adjustment: Yes

Risk Adjustment:
The purpose of the risk-adjustment is to determine the provider and system level contributions to the outcome after adjusting for patient-level demographic and clinical characteristics. Three day return ED visits are risk-adjusted for the overall and subgroups as a binary outcome.

Risk-adjustment derivation:
Model: A regression model with fixed-effects (patient age, sex, visit acuity, previous ED visits and presence of co-morbidities) as well as hospital-level effects (state and ED volume) is used. Normal distribution is ensured and then a linear regression performed. To ensure that only valid data are included and risk-adjustment models are created with stable coefficients, non-normal data will be normalized through a two-step process: 1) the data will have a 90% truncation by dropping values below the 5th percentile or above the 95th percentile. 2) Based on a graphical exploration of possible transformations and a chi-square-goodness-of-fit assessment of the transformation for normality, an appropriate transformation (such as a logarithm, square root, etc) will be applied. After the predictions are created, the measure will be returned to its natural scale through reversing the transformation process (taking the exponent of the prediction that was derived from the logarithm of the dependent variable).

Dataset: The most current National Hospital Ambulatory Medical Care Survey (NHAMCS) dataset is utilized. The derivation dataset will be a 75% random sample of the relevant dataset. The co-morbidities are derived in the NHAMCS dataset by mapping the ICD9 and ICD10 diagnoses to the Charleston comorbidity index.

Risk-adjustment validation: The results of the risk-adjustment derivation are used as a model with the relative patient level factors and a beta-coefficient weight for each of those factors. These coefficients are applied to the 25% validation sample to evaluate the discriminant value (c-statistic) and calibration (Hosmer-Lemeshow) of the risk-adjustment model.

Risk-adjustment application: The coefficient weights from the risk-adjustment model are applied to the performance data to provide an expected outcome for each patient. For each provider, the observed outcome over the expected outcome is summed to produce an observed/expected ratio.

Rationale:
Although not all 3 day return ED visits are avoidable, return ED visits may negatively affect patient safety, satisfaction, and overall medical cost. Studies have determined that some of the factors that cause patients to return are modifiable which may allow for the development of strategies to reduce unscheduled return visits. These factors may include primary care follow-up, medication compliance, medication selection, clarity of discharge instructions, and overall satisfaction with care. Monitoring 3 day return ED visits is a useful method to assist Eligible Professionals in improving their care of ED patients.

Selected References:

12 of 50
E-CPR (Emergency – Clinical Performance Registry) Measure #39
Referenced Choosing Wisely, Emergency Medicine Campaign Measure #6

Measure Title: Avoid Head CT for Patients with Uncomplicated Syncope

Inverse Measure: No

Measure Description: Percentage of Adult Syncope Patients Who Did Not Receive a Head CT Scan Ordered by the Provider

National Quality Strategy Domain: Efficiency and Cost Reduction

Type of Measure: Process, High Priority

Number of Performance Rates: 1

Measure Scoring: Proportion

Numerator: Syncope Patients Who Did Not Have a Head CT Ordered by the Provider

Numerator Options
- Performance Met: Patients who did not have a head CT ordered
- Medical Performance Exclusion (Denominator Exception): Patients who did have a head CT ordered for medical reason documented by the eligible professional (i.e. seizure, drug or alcohol intoxication, vomiting, altered mental status, or other documented medical reason)
- Performance Not Met: Patients who did have a head CT ordered, reason not given

Numerator Exclusions: None

Denominator:
- Any patient ≥18 years of age evaluated by the Eligible Professional in the Emergency Department or Urgent Care Clinic (E/M Codes 99201-99205, 99212-99215, 99281-99285, & 99291-99292 AND Place of Service Indicator: 11, 19, 20, 22 or 23) PLUS
- Diagnosis of Syncope:
  - ICD-10: R55
- Transferred, eloped or AMA patients are excluded

Denominator Exclusions: None

Risk Adjustment: No

Rationale:
(Referenced Choosing Wisely, Emergency Medicine Campaign Measure #6)
Syncope (passing out or fainting) or near syncope (lightheadedness or almost passing out) is a common reason for visiting an emergency department or urgent care clinic and most episodes are not serious. Many tests may be ordered to identify the cause of such episodes. However, some diagnostic tests for syncope should not be routinely ordered, and the decision to order any tests should be guided by information obtained from the patient’s history or physical examination. CT scans of the brain are frequently ordered, but published research has confirmed that abnormalities are rarely found. CT scans are expensive, and may unnecessarily
expose patients to radiation. If a head injury is associated with a syncopal episode, then a CT scan of the brain may be indicated. In addition, if there were symptoms of a stroke (i.e., headache, garbled speech, weakness in one arm or leg, trouble walking or confusion) before or after a syncopal episode, a CT scan may be indicated. However, in the absence of head injury or signs of a stroke, a CT scan of the brain should not be routinely ordered.

"The 2009 ESC guidelines recommended neurologic referral in patients in whom transient loss of consciousness is suspected to be epilepsy rather than syncope. In addition, neurologic referral to evaluate the underlying disease is indicated when syncope is due to autonomic failure. An EEG or carotid Doppler ultrasound study, computed tomography, or magnetic resonance imaging is not recommended unless a non-syncopal cause of transient loss of consciousness is suspected."

"Neurologic tests, including electroencephalogram (EEG), brain computed tomography scan, brain magnetic resonance imaging, and carotid Doppler ultrasound, are frequently obtained in patients with syncope. In one review of 649 patients, 53 percent had at least one neurologic test. However, such testing was rarely useful."

Selected References:
- American College of Emergency Physicians (ACEP) and Choosing Wisely Campaign
E-CPR (Emergency – Clinical Performance Registry) Measure #40
Adopted from the Surviving Sepsis Campaign

**Measure Title:** Initiation of the Initial Sepsis Bundle

**Inverse Measure:** No

**Measure Description:** Percentage of Adult Emergency Department Patients Diagnosed with Severe Sepsis or Septic Shock That Have Initiation of the Initial Sepsis Bundle

**National Quality Strategy Domain:** Effective Clinical Care

**Type of Measure:** Process

**Number of Performance Rates:** 1

**Measure Scoring:** Proportion

**Risk Adjustment:** No

**Numerator:** Emergency Department Patients Diagnosed with Severe Sepsis or Septic Shock Who Have Initiation of the Initial Sepsis Bundle

**Definition of initiation of initial sepsis bundle:** Provider order for (or protocol resulting in order for) ALL of the following:
- Lactate (venous or arterial)
- Blood cultures
- IV antibiotics
- IV fluid bolus

**Numerator Options**
- Performance Met: Patients who did have initiation of initial sepsis bundle (must include all components)
- Medical Performance Exclusion (Denominator Exception): Patients who did not have initiation of the initial sepsis bundle for documented medical reason(s) (i.e. IV fluids not ordered given patient is in congestive heart failure, or other medical reason)
- Patient Performance Exclusion (Denominator Exception): Patients who did not have initiation of the initial sepsis bundle for documented patient reason(s) (i.e. blood cultures not ordered because patient refused or other patient reason)
- Performance Not Met: Patients who did not have initiation of the initial sepsis bundle, reason not given

**Numerator Exclusions:** None

**Denominator:**
- Any patient > 18 years of age evaluated by the Eligible Professional in the Emergency Department (E/M Codes 99281-99285 & 99291-99292 AND Place of Service Indicator: 23) PLUS
- ED diagnosis of either of below:
  - Severe Sepsis:
ICD-10: A41.9 AND R65.20

- Septic Shock:
  - ICD-10: A41.9 AND R65.21
  - Transferred, eloped or AMA patients are excluded
  - Patients with Advanced Directives indicating preference for limited intervention are excluded

**Denominator Exclusions:** None

**Rationale:**
There are more than 750,000 cases of severe sepsis and septic shock in the United States each year. Most patients who present with sepsis receive initial care in the emergency department, and the short-term mortality is 20% or more. In 2001, Rivers et al. reported that among patients with severe sepsis or septic shock, mortality was significantly lower among those who were treated according to a sepsis bundle with protocol than among those who were given standard therapy (30.5% vs. 46.5%). This premise predicates that usual care lacked aggressive, timely assessment and treatment. There have been many changes in the specific management of sepsis as to whether certain aspects of a protocol are necessary (e.g. blood transfusion parameters, vasoactive agent initiation, mandated central line placement). Overall, there is strong evidence that an initial order bundle involving IVF bolus, Blood cultures, IV antibiotics, and lactate to support its broad applicability.

**Performance Gap:**
In their 2017 submission to the National Quality Forum, Henry Ford Hospital presented a detailed analysis of Q4 2015 through Q2 2016 data on the SEP-1 measure from the first three quarters of SEP-1 measure implementation in the Inpatient Quality Reporting (IQR) program, highlighting performance gaps for each of the three hour bundle elements which align with those captured in the E-CPR sepsis measure. Specifically, that patients with severe sepsis failed to receive recommended treatment in 32.7% of eligible cases, and of those failures 48.5% failed to obtain an initial lactate level, 38.4% failed to receive broad spectrum antibiotics, 34.4% failed to have blood cultures drawn, and 45.5% failed to be administered fluids within the three hour time window, which is the time that patients are most likely to still be in the emergency department (Henry Ford 2017).

These results are consistent with performance gaps previously reported in the literature. For example, in a large-scale, multicenter study of compliance with the Surviving Sepsis Campaign guidelines, only 61% of patients had an initial lactate value measured in the first quarter of the study. In the final quarter, only 78.7% of patients had an initial lactate measurement. (Levy 2010) A prospective multi-center observational study found that compliance with the Surviving Sepsis Campaign 2012 guidelines recommendation to draw blood cultures before antibiotics were administered was only in the range of 54.4 to 64.5%. (Bloos 2014, Angus 2001) Results from a multicenter observational study including 15,022 patients from 165 hospitals demonstrated that patients with septic shock were given broad spectrum antibiotics 60.4% in the first quarter of the study. At the final quarter, the increase of compliance on providing antibiotics only increased 7.5% to 67.9%. Clearly, the opportunity to provide comprehensive and timely care to septic shock patients exists. (Levy 2010) A multi-center randomized controlled trial of early sepsis resuscitation found mortality was significantly increased in
patients who received initial antibiotics after septic shock recognition compared with before septic shock recognition. Only 59% of patients received the initial dose of antibiotics after recognition of septic shock. This demonstrates that delay to antibiotics is harmful and persists. (Puskarich 2011) A prospective observational study on over one hundred consecutive adult patients with severe sepsis or septic shock found that only 84% of patients with documented hypotension received immediate fluid administration (0.5L). (Gao 2005) The amount considered adequate in this study is lower than the threshold outlined in this measure (greater than or equal to 1 liter of crystalloids), which may indicate critically ill patients with septic shock receive appropriate fluids at an even lower rate.

Selected References:

- Surviving Sepsis Campaign
Measure Title: Coagulation Studies in Patients Presenting with Chest Pain with No Coagulopathy or Bleeding

Inverse Measure: Yes

Measure Description: Percentage of Patients Aged 18 Years and Older with a Diagnosis of Chest Pain Where the Provider Ordered Coagulation Studies (PT, PTT, or INR)

National Quality Strategy Domain: Efficiency and Cost Reduction

Type of Measure: Process, High Priority

Number of Performance Rates: 1

Measure Scoring: Proportion

Risk Adjustment: No

Numerator: Patients Aged 18 Years and Older with a Diagnosis of Chest Pain Where the Provider Ordered Coagulation Studies (PT, PTT, or INR)

Numerator Options:
- Performance Met: Patients who did have coagulation studies ordered, reason not given
- Performance Not Met: Patients who did not have coagulation studies ordered

Numerator Exclusions: None

Denominator:
- Any patient > 18 years of age evaluated by the Eligible Professional in the Emergency Department (E/M Codes 99281-99285 & 99291-99292 AND Place of Service Indicator: 23) PLUS
- Diagnosis of Non-traumatic Chest Pain:
- Transferred, eloped or AMA patients are excluded

Denominator Exclusions:
- Patients with trauma, end stage liver disease, coagulopathy, thrombocytopenia, atrial fibrillation, pulmonary/GI hemorrhage, pregnancy, or for whom medical history is unable to be obtained OR
- Patients taking any of the following anticoagulation therapies:
  - Apixaban
  - Argatroban
  - Bivalirudin
  - Dalteparin
  - Dateparin
Desirudin
Enoxaparin
Fondaparinux
Heparin
Lepirudin
Rivaroxaban
Tinzaparin
Warfarin

Rationale:
Coagulation studies are often ordered out of habit as part of a blood panel with little value added to the patient. Ensuring that clinicians are purposefully ordering these studies may lead to significant reduction in resource utilization without any decrease in value of healthcare provided to the patient.

Analyses have suggested that, in addition to the financial cost of performing unnecessary coagulation testing, there are other undesirable outcomes of unnecessary coagulation testing. These outcomes include increased false-positive results in low prevalence populations, an increase in unnecessary follow-up procedures, and an increase in unnecessary hospital days.

In the United States, it is estimated that $114 million are spent annually on coagulation testing for patients presenting with chest pain and without any other indications in the Emergency Department. Across laboratory testing overall, between 15% and 56% of tests are considered to have been ordered inappropriately; in a study of coagulation studies specifically, it was found that 81% of coagulation tests were ordered inappropriately.

ACEP Guidelines for appropriate utilization of clinical laboratory and radiology studies note the following indications for ordering coagulation studies (PT and PTT):
- Warfarin (Coumadin) use [PT indicated, PTT not indicated]
- IV Heparin therapy [PT not indicated, PTT indicated]
- Routine Hospital Admission [PT not indicated, PTT not indicated]
- Suspected Coagulopathy (DIC, hemophilia) [PT indicated, PTT indicated]
- Active bleeding with or without obvious cause [PT indicated, PTT indicated]
- Clinical evidence of liver disease [PT indicated, PTT indicated]
- History of abnormal, excessive, or spontaneous bleeding [PT indicated, PTT indicated]
- Routine preoperative testing [PT not indicated, PTT not indicated]
- History of coagulopathy [PT indicated, PTT indicated]
- Routine trauma patient [PT not indicated, PTT not indicated]
- Before initiation of heparin therapy [PT not indicated, PTT not indicated]
- Low-dose initiation of heparin therapy [PT not indicated, PTT not indicated]
- History of alcohol abuse, without clinical evidence of liver disease or coagulopathy [PT not indicated, PTT not indicated]
- Before surgery if liver disease, malnutrition, or malabsorption exists or clinical history is not available

Selected References:
E-CPR (Emergency – Clinical Performance Registry) Measure #44

**Measure Title:** Door to Diagnostic Evaluation by a Provider Within 30 Minutes – Urgent Care Patients

**Inverse Measure:** No

**Measure Description:** Percentage of Urgent Care Patients Who Made Provider Contact Within 30 Minutes of Urgent Care Clinic (UCC) Arrival

**National Quality Strategy Domain:** Patient Safety

**Type of Measure:** Outcome

**Number of Performance Rates:** 1

**Measure Scoring:** Proportion

**Risk Adjustment:** No

**Numerator:** Urgent Care Patients Who Made Provider (MD/DO/PA/NP) Contact Within 30 Minutes of Urgent Care Clinic Arrival
  
  • Definition of Arrival Time: The earliest documented time the patient arrived at the Urgent Care Clinic
  
  • Definition of Provider Contact Time: The time of the first direct, personal exchange between an Urgent Care patient and the Eligible Professional

**Numerator Exclusions:** None

**Denominator:** Any Patient Evaluated by the Eligible Professional (MD/DO/PA/NP) in the Urgent Care Clinic (E/M Codes 99201-99205 & 99212-99215 AND Place of Service Indicator: 11, 19, 20 or 22)

**Denominator Exclusions:** None

**Rationale:**
Reducing the time patients spend in the urgent care clinic setting can improve access to treatment and increase quality of care. Reducing this time potentially improves access to care tailored to patient needs, increases the capability to provide additional treatment or divert patients quickly to emergency departments (EDs) as necessary, and improves patient satisfaction. Timely access to urgent care is especially pertinent as EDs have continued to experience significant overcrowding and prolonged wait times in recent times, and an estimated 27% of ED visits could be treated in the urgent care setting. With the increased number of urgent care clinics in recent years, urgent care clinics have become an increasingly viable option for patients seeking immediate treatment, imaging and testing for lower-acuity conditions who have traditionally sought care at emergency departments.

**Selected References:**
- Weinick RM, Burns RM, Mehrotra A. Many Emergency Department Visits Could Be Managed At Urgent Care Centers And Retail Clinics. *Health Aff.* 2010; 29(9):1630-1636.
• Urgent Care Association of America. "2015 Urgent Care Benchmarking Survey Results." 2015.
E-CPR (Emergency – Clinical Performance Registry) Measure #41

**Measure Title:** Rh Status Evaluation and Treatment of Pregnant Women at Risk of Fetal Blood Exposure

**Inverse Measure:** No

**Measure Description:** Percentage of Women Aged 14-50 Years at Risk of Fetal Blood Exposure Who Had Their Rh Status Evaluated in the Emergency Department (ED) and Received Rh-Immunoglobulin (Rhogam) if Rh-negative

**National Quality Strategy Domain:** Patient Safety

**Type of Measure:** Process, High Priority

**Number of Performance Rates:** 1

**Measure Scoring:** Proportion

**Numerator:** Women Aged 14-50 Years at Risk of Fetal Blood Exposure Who Had Their Rh Status Evaluated in the ED and Received Rh-Immunoglobulin (Rhogam) if Rh-negative

- **Numerator Options**
  - Performance Met: Patients who had their Rh status evaluated and were confirmed Rh-positive OR Patients who had Rh status evaluated AND received an order for Rh-Immunoglobulin (Rhogam) if Rh-negative
    - Definition of Rh status evaluated: Laboratory testing of Rh status or documented Rh status (e.g., “Patient known Rh+”)
  - Medical Performance Exclusion (Denominator Exception): Patients who did not have Rh status evaluated or did not receive an order of Rh-Immunoglobulin (Rhogam) if Rh-negative for documented medical reasons
  - Patient Performance Exclusion (Denominator Exception): Patients who did not have Rh status evaluated or did not receive an order of Rh-Immunoglobulin (Rhogam) if Rh-negative for documented patient reason(s) (e.g., patient refused Rh testing or Rhogam)
  - Performance Not Met: Patients who did not have Rh status evaluated or did not receive Rh-Immunoglobulin (Rhogam) if Rh-negative, reason not given

**Numerator Exclusions:** None

**Denominator:**
- Any Female Patient > 14 Years of Age and < 51 Years of Age Evaluated by the Eligible Professional in the ED (E/M Codes 99281-99285 & 99291-99292) PLUS
- ED Diagnosis of high risk pregnancy complication:
  - **ICD-10:** O00.80, O00.81, O00.90, O00.91, O02.1, O03.1, O03.6, O04.6, O07.1, O08.1, O20.0, O20.8, O20.9, O43.011, O43.019, O44.10, O44.11, O45.001, O45.009, O45.011, O45.019, O45.021, O45.029, O45.091, O45.099, O45.8X1, O45.8X9, O45.90, O45.91, O46.001, O46.011, O46.021, O46.8X1, O46.8X9, O46.90, O46.91
- Transferred, eloped or AMA patients are excluded
Denominator Exclusions: None

Risk Adjustment: No

Rationale: (Referenced CMS PQRS Measure #255 Specifications)
The potential for maternal exposure to fetal blood is a concern among pregnant patients presenting to the emergency department with a number of common complaints or diagnoses including abdominal pain, blunt abdominal trauma, vaginal bleeding, ectopic pregnancy, threatened or spontaneous abortion, or pelvic instrumentation. This concern increases after the first trimester as fetal RBC mass increases.

Exposure to less than 0.1 ml of fetal blood of a different rhesus (Rh) antigenicity among Rh negative has been shown to increase the risk of maternal alloimmunization. Alloimmunization can result in hemolytic disease of the fetus or newborn including spontaneous abortion, fetal hemolytic anemia, hydrops fetalis and severe neonatal jaundice in subsequent pregnancies.

Administration of Rh-Immunoglobulin (Rhogam) is recommended by the American College of Obstetricians and Gynecologists (ACOG) as prophylaxis for alloimmunization.
E-CPR (Emergency – Clinical Performance Registry) Measure #42

Measure Title: Restrictive Use of Blood Transfusions

Inverse Measure: No

Measure Description: Percentage of Adult Patients with a Diagnosis of Anemia Who Did Not Receive a Blood Transfusion When Hgb > 8g/dL (Restrictive Transfusion Guidelines)

National Quality Strategy Domain: Efficiency and Cost Reduction

Type of Measure: Process, High Priority

Number of Performance Rates: 1

Measure Scoring: Proportion

Numerator: Patients Who Did Not Receive a Transfusion of Packed Red Blood Cells (When Hgb>8g/dL)

Numerator Options:
- Performance Met: Patients who did not have a transfusion of packed red blood cells
- Medical Performance Exclusion (Denominator Exception): Patients who did have a transfusion of packed blood cells for medical reason(s) documented by the eligible professional [e.g., acute coronary syndrome (acute myocardial infarction, unstable angina), symptomatic patients, severe thrombocytopenia, chronic transfusion-dependent anemia, hemodynamic instability, severe hemorrhage, other documented medical reason]

Performance Not Met: Patients who did have a transfusion of packed red blood cells, reason not specified

Numerator Exclusions: None

Denominator:
- Any patient > 18 years of age evaluated by the Eligible Professional (E/M Codes 00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00160, 00162, 00164, 00170, 00172, 00176, 00190, 00192, 00210, 00211, 00212, 00214, 00215, 00216, 00220, 00222, 00300, 00320, 00322, 00326, 00350, 00352, 00400, 00402, 00404, 00406, 00410, 00450, 00452, 00454, 00470, 00472, 00474, 00500, 00520, 00522, 00524, 00528, 00529, 00530, 00532, 00534, 00537, 00539, 00540, 00541, 00542, 00546, 00548, 00550, 00560, 00561, 00562, 00563, 00565, 00567, 00580, 00600, 00620, 00625, 00626, 00630, 00632, 00635, 00640, 00670, 00700, 00702, 00730, 00740, 00750, 00752, 00754, 00756, 00770, 00790, 00792, 00794, 00796, 00797, 00800, 00802, 00810, 00820, 00830, 00834, 00836, 00840, 00844, 00846, 00848, 00851, 00860, 00862, 00864, 00865, 00866, 00868, 00870, 00873, 00880, 00882, 00902, 00904, 00906, 00908, 00910, 00912, 00914, 00918, 00920, 00921, 00922, 00924, 00926, 00928, 00930, 00932, 00934, 00936, 00938,
Diagnosis of Anemia PLUS

- ICD-10: D50.0, D50.1, D50.8, D50.9, D51.0, D51.2, D51.3, D51.8, D51.9, D52.0, D52.1, D52.8, D52.9, D53.0, D53.1, D53.2, D53.8, D53.9, D55.0, D55.1, D55.2, D55.3, D55.8, D58.0, D58.1, D58.2, D58.8, D58.9, D59.0, D59.1, D59.2, D59.3, D59.4, D59.5, D59.6, D59.8, D59.9, D61.01, D61.09, D61.1, D61.2, D61.3, D61.810, D61.811, D61.818, D61.82, D61.89, D61.9, D62, D63.0, D63.1, D63.8, D64.0, D64.1, D64.2, D64.3, D64.4, D64.81, D64.89, D64.9

- Laboratory result of Hgb > 8 g/dL documented in the medical record

- Transferred, eloped or AMA patients are excluded

- Patients with trauma are excluded

Denominator Exclusions: None

Risk Adjustment: No

Rationale:
Blood transfusion is the standard of care for management of anemia. More than 100 million units of blood are collected worldwide each year and approximately 15 million units are transfused in the US every year.\(^1,4\) The optimal hemoglobin threshold for use of blood transfusion is not clear; however, studies have demonstrated that transfusions are generally not indicated for Hgb > 10 g/dL but are almost always indicated for Hgb < 6 d/L.\(^6\) Current transfusion guidelines aim to avoid unnecessary transfusions and the associated costs and risks.

Multicenter randomized controlled trials (RCTs) have shown that using a restrictive hemoglobin strategy (7 to 8 g/dL) is associated with equivalent treatment benefit and better outcomes in many patient populations.\(^1,5\) Additionally, a 2016 Cochrane systematic review of 31 RCTs has shown that more aggressive management of anemia with liberal transfusion strategies (Hgb 9 to 10 g/dL) does not improve mortality and morbidity when compared to restrictive transfusion strategies (Hgb 7 to 8 g/dL).\(^2\)

The American Association of Blood Banks (AABB) recommends that a restrictive transfusion threshold of Hgb 7 to 8 g/dL is safe in most hemodynamically stable medical and surgical patients.\(^1,3\) Evidence is insufficient to make this recommendation for symptomatic patients, patients with acute coronary syndrome, patients requiring massive transfusion, patients with...
severe thrombocytopenia in hematology/oncology patients, and patients with chronic transfusion-dependent anemia.

Transfusions are not without risk. Potential complications include transfusion reaction, transmission of blood-borne pathogens, allergic reaction, acute hemolytic reaction, transfusion-associated acute lung injury (TRALI), transfusion-associated circulatory overload (TACO), and transfusion-associated graft versus host disease. Restrictive transfusion strategies reduce the total number of blood transfusions and consequently reduce the risk of transfusion complications.

Selected References:

E-CPR (Emergency – Clinical Performance Registry) Measure #47

**Measure Title:** Avoidance of Opiate Prescriptions for Greater Than 3 Days Duration for Acute Pain

**Inverse Measure:** No

**Measure Description:** Percentage of Adult Patients Who Were Prescribed an Opiate for Whom the Prescription Duration Was Not Greater than 3 days for Acute Pain

**National Quality Strategy Domain:** Patient Safety

**Type of Measure:** Process, High Priority

**Number of Performance Rates:** 1

**Measure Scoring:** Proportion

**Numerator:** Patients who were not prescribed an opiate (see Appendix A for list of opioid medications) for greater than 3 days duration

- **Numerator Options:**
  - Performance Met: Opiate not prescribed for greater than 3 days duration
  - Medical Performance Exclusion (Denominator Exception): Opiate prescribed for terminal (late-stage) cancer, comfort care measures, or palliative care
  - Performance Not Met: Opiate prescribed for greater than 3 days, reason not specified

**Numerator Exclusions:** None

**Denominator:**
- Any patient ≥ 18 years of age evaluated by the Eligible Professional in the Emergency Department or Urgent Care Clinic (E/M Codes 99201-99205, 99212-99215, 99281-99285, & 99291-99292 AND Place of Service Indicator: 11, 19, 20, 22 or 23) PLUS
  - Opiate prescribed PLUS
  - ICD-10 diagnosis codes for pain, strains, sprains, lacerations, open wounds and fractures (see Appendix B for codes) PLUS
  - Disposition of Discharged
  - Transferred, eloped or AMA patients are excluded

**Denominator Exclusions:** None

**Risk Adjustment:** No

**Rationale:**
Drug overdose is now the leading cause of accidental deaths in the US, exceeding deaths due to motor vehicle accidents. A majority of those deaths involve prescription drugs. The diversion of opioid medications to non-medical uses has also contributed to the increased number of deaths. In 2015, prescription opioids and heroin killed over 33,000 people. The Centers for Disease Control and Prevention (CDC) estimates that, on average, 91 U. S. citizens die from an opioid overdose every day, and nearly half of these overdoses are caused by prescription
drugs. Since 1999, the number of prescription opioids sold in the US and the number of prescription opioid-related deaths has quadrupled. The majority of prescription opioids used for nonmedical reasons are diverted from prescriptions originally written for therapeutic use. (Dowell CDC 2016) Injuries related to opioid medications are also occurring among general patient populations, and with some risk groups, such as those suffering from depression (Brown 2014). Of the estimated 1.2 million emergency department (ED) visits involving nonmedical use of pharmaceuticals in 2011, nearly 30% involved narcotic pain relievers. (Crane 2015) ED visits involving nonmedical use of narcotic pain relievers increased 117 percent from 2005 to 2011. (Crane 2015)

The Centers for Disease Control and Prevention (CDC), the American College of Emergency Physicians (ACEP), the American Academy of Emergency Medicine (AAEM), the Emergency Medicine Patient Safety Foundation (Papa 2013), Washington State (Neven 2012), the Medical Board of California (Brown 2013), the Maryland Hospital Association (MHA 2014) and the New York City Department of Health and Mental Hygiene (Chu 2013) are among the organizations that recommend opioids only if the severity of the pain is reasonably assumed to warrant their use, or if the pain is refractory to other analgesics, and even then only for the short durations or small quantities. According to the CDC, “Long-term opioid use often begins with treatment of acute pain. When opioids are used for acute pain, clinicians should prescribe the lowest effective dose of immediate-release opioids and should prescribe no greater quantity than needed for the expected duration of pain severe enough to require opioids. Three days or less will often be sufficient; more than seven days will rarely be needed.” (Dowell CDC 2016)

A study of opioid use among over 1 million commercially-insured, opioid-naïve, cancer-free adults demonstrated that an increase in the probability of long-term opioid use increases most sharply in the first days of therapy, particularly after 5 days have been prescribed (Shah 2017). Few acutely painful conditions treated in the emergency department require more than a short 3-day course of opioid therapy. (Rodgers 2012) Longer courses of opioid treatment are associated with increased risk of physical dependence, abuse (Logan 2013) and disability. (Franklin 2008) In addition, opioid use beyond 3 days results in diminished efficacy and potential increased pain sensitivity (Brush 2012).

**Performance Gap:**
A recent report from the Office of the Inspector General (OIG) noted that 5 million Medicare Part D beneficiaries received opioids for 3 months or more in 2016, thus substantially increasing their risk of opioid dependence. Of these 5 million beneficiaries, 3.6 million received opioids for 6 or more months and nearly 610,000 received opioids for the entire year. More concerning is that nearly 90,000 Medicare Part D beneficiaries are at serious risk of opioid misuse or overdose. In total, over 115,000 clinicians ordered opioids for at least one beneficiary at serious risk of opioid misuse or overdose. (OIG 2017)

Studies have shown that there is wide variation in opioid prescribing practices, which includes numbers of pills and prescription duration in addition to choice of pain medication. In one study, prescribing rates ranged from 33 to 332 prescriptions per 1000 visits. In another study, the median days of supply for acute pain was 5 days but 10% of prescriptions were written for 30 days or more. (Smulowitz 2016, Liu 2013)

Statistics from the OIG report and studies demonstrate a significant performance gap in the duration of opioid prescriptions as they differ from that recommended by national guidelines. (OIG 2017, Smulowitz 2016, Liu 2013)
Selected References:

- Pappa A. Emergency Medicine Patient Safety Foundation (EMPSF) Prescribing and
dispensing opioids in the emergency department. January 2013.
http://www.preiersafetynstitute.org/wp-content/uploads/Prescribing-Dispensing-Opioids-
ER-Hallam-Final.pdf

- Rodgers J, Cunningham K, Fitzgerald K, Finnerty E. Opioid consumption following
- Shah A, Hayes CJ, Martin BC. Characteristics of Initial Prescription Episodes and Likelihood
2017;66:265–269. DOI: http://dx.doi.org/10.15585/mmwr.mm6610a1
- Smulowitz PB, Cary C, Boyle KL, Novack V, Jagminas L. Variation in opioid prescribing
2011;305:1299-1301.
E-CPR (Emergency – Clinical Performance Registry) Measure #48

Measure Title: Avoidance of Long-Acting (LA) or Extended-Release (ER) Opiate Prescriptions

Inverse Measure: No

Measure Description: Percentage of Adult Patients Who Were Prescribed an Opiate Who Were Not Prescribed a Long-Acting (LA) or Extended-Release (ER) Formulation

National Quality Strategy Domain: Patient Safety

Type of Measure: Process, High Priority

Number of Performance Rates: 1

Measure Scoring: Proportion

Numerator: Patients who were not prescribed a long-acting (LA) or extended-release (ER) opiate

Definition:

<table>
<thead>
<tr>
<th>Long-Acting Opioid Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arymo ER (morphine sulfate)</td>
</tr>
<tr>
<td>Belbuca (buprenorphine)</td>
</tr>
<tr>
<td>buprenorphine</td>
</tr>
<tr>
<td>Butrans (transdermal buprenorphine)</td>
</tr>
<tr>
<td>Dolophine (methadone hydrochloride)</td>
</tr>
<tr>
<td>Duragesic (fentanyl transdermal system)</td>
</tr>
<tr>
<td>Embeda (morphine sulfate and naltrexone hydrochloride)</td>
</tr>
<tr>
<td>Exalgo (hydromorphone hydrochloride)</td>
</tr>
<tr>
<td>fentanyl transdermal system</td>
</tr>
<tr>
<td>hydrocodone bitartrate extended-release</td>
</tr>
<tr>
<td>hydromorphone hydrochloride extended-release</td>
</tr>
<tr>
<td>Hysingla ER (hydrocodone bitartrate)</td>
</tr>
<tr>
<td>Kadian (morphine sulfate)</td>
</tr>
<tr>
<td>methadone hydrochloride</td>
</tr>
<tr>
<td>Methadose (methadone hydrochloride)</td>
</tr>
<tr>
<td>Morphabond (morphine sulfate)</td>
</tr>
<tr>
<td>morphine sulfate extended release</td>
</tr>
<tr>
<td>MS Contin (morphine sulfate)</td>
</tr>
<tr>
<td>Nucynta ER (tapentadol)</td>
</tr>
<tr>
<td>Opana ER (oxymorphone hydrochloride)</td>
</tr>
<tr>
<td>Opana ER (oxymorphone hydrochloride)</td>
</tr>
<tr>
<td>OxyContin (oxycodone hydrochloride)</td>
</tr>
<tr>
<td>oxymorphone hydrochloride extended release</td>
</tr>
<tr>
<td>Targiniq ER (oxycodone and naloxone hydrochloride)</td>
</tr>
<tr>
<td>Troxyca ER (oxycodone hydrochloride and naloxone hydrochloride)</td>
</tr>
<tr>
<td>Vantrela ER (hydrocodone bitartrate)</td>
</tr>
<tr>
<td>Xtampza ER (oxycodone)</td>
</tr>
<tr>
<td>Zohydro ER (hydrocodone)</td>
</tr>
</tbody>
</table>

Source: Adapted from FDA Approved Risk Evaluation and Mitigation Strategies (REMS) for Extended-Release and Long-Acting (ER/LA) Opioid Analgesics
Numerator Options:
- Performance Met: LA/ER formulation opiate not prescribed
- Medical Performance Exclusion (Denominator Exception): LA/ER formulation opiate prescribed for terminal (late-stage) cancer, comfort care measures, palliative care, or coordinated plan of care for Medication Assisted Treatment (MAT)
- Performance Not Met: LA/ER formulation opiate prescribed, reason not specified

Numerator Exclusions: None

Denominator:
- Any patient ≥ 18 years of age evaluated by the Eligible Professional in the Emergency Department or Urgent Care Clinic (E/M Codes 99201-99205, 99212-99215, 99281-99285, & 99291-99292 AND Place of Service Indicator: 11, 19, 20, 22 or 23) PLUS
- Opiate prescribed (see Appendix A for list of opioid medications) PLUS
- ICD-10 diagnosis codes for pain, strains, sprains, lacerations, open wounds and fractures (see Appendix B for codes) PLUS
- Disposition of Discharged
- Transferred, eloped, or AMA patients are excluded

Denominator Exclusions: None

Risk Adjustment: No

Rationale:
Extended-release (ER) and long-acting (LA) opioids include methadone, transdermal fentanyl, and extended-release versions of opioids such as oxycodone, oxymorphone, hydrocodone, and morphine. The Centers for Disease Control and Prevention (CDC), the American Academy of Emergency Medicine (AAEM), the Emergency Medicine Patient Safety Foundation (Papa 2013), Washington State (Neven 2012), the Medical Board of California (Brown 2013), the Maryland Hospital Association (MHA 2014) and the New York City Department of Health and Mental Hygiene (Chu 2013) all recommend against the use of long-acting opioids. In addition, the American College of Emergency Physicians (ACEP) notes that LA/ER products such as oxycodone ER (OxyContin), methadone, fentanyl patches, or morphine extended-release (MS Contin) should not be used for acute pain (Cantrill 2012). “The administration or prescription of long-acting opioid analgesics requires the capability for long-term monitoring for both pain relief and for signs of dependence and addiction.” (Pappa EMPSF 2013) “Given longer half-lives and longer duration of effects [as well as risk for respiratory depression] with ER/LA opioids such as methadone, fentanyl patches, or extended release versions of opioids such as oxycodone, oxymorphone, or morphine, clinicians should not prescribe ER/LA opioids for the treatment of acute pain.” (Dowell CDC 2016)

Long-acting opioids are associated with higher risk for detrimental and potentially life-threatening side effects of opiate medications and do not have a role in the treatment of acute pain syndromes (Keuhn 2012, Nelson 2012). The pharmacokinetics of these medications result in an unpredictable peak effect and increase the risk of respiratory depression. Additionally, prescriptions for long-acting and extended-release opiates are more susceptible to diversion and non-medical opioid use (Nelson 2012) and raise the risk of opioid overdose death. (Garg
A recent cohort study of Veterans Affairs patients found initiation of therapy with an ER/LA opioid associated with greater risk for unintentional, nonfatal overdose than initiation with an immediate-release opioid (hazard ratio [HR], 2.33; 95% CI, 1.26-4.32), with risk greatest in the first two weeks after initiation of treatment (HR, 5.25; 1.88-14.72) (Miller 2015). In a retrospective cohort study between 1999 and 2012 of Tennessee Medicaid patients with chronic non-cancer pain and no palliative or end-of-life care, the mortality risk was four times greater for the long acting cohort during the first month of therapy. (Ray 2016).

Given the serious risks associated with ER/LA opioids, this class of medications is indicated specifically for management of pain severe enough to require daily, around-the-clock, long-term opioid treatment in patients for whom other treatment options (e.g., non-opioid analgesics or immediate-release opioids) are ineffective, not tolerated, or would be otherwise inadequate to provide sufficient management of pain (FDA 2013). Methadone has been associated with disproportionate numbers of overdose deaths relative to the frequency with which it is prescribed for pain. (Paulozzi 2012).

Performance Gap:
In a large, commercially-insured adult population, greater than 3 million eligible enrollees who received at least one opioid prescription were analyzed for indicators of potential opioid misuse (Liu 2013). Among those prescribed LA/ER opioids, a quarter of patients were treated for acute pain, despite guideline recommendations highlighting the risks of initiating patients on LA/ER therapy, and nearly a quarter of prescriptions overlapped with other existing LA/ER opioid prescriptions, which is a recognized indicator for opioid misuse (Liu 2013) and nearly doubles the risk of overdose and mortality. (Miller 2015, Ray 2016)

Selected References:
- FDA Approved Risk Evaluation and Mitigation Strategies (REMS) for Extended-Release and Long-Acting (ER/LA) Opioid Analgesics


• Kuehn BM. Methadone overdose deaths rise with increased prescribing for pain. JAMA;2012; 308:749-50.


E-CPR (Emergency – Clinical Performance Registry) Measure #46

Measure Title: Avoidance of Opiate Prescriptions for Low Back Pain or Migraines

Inverse Measure: No

Measure Description: Percentage of Patients with Low Back Pain and/or Migraines Who Were Not Prescribed an Opiate

National Quality Strategy Domain: Patient Safety

Type of Measure: Process, High Priority
Number of Performance Rates: 1

Measure Scoring: Proportion

Numerator: Patients who were not prescribed an opiate (see Appendix A for list of opioid medications)
- Performance Met: Opiate not prescribed
- Medical Performance Exclusion (Denominator Exception): Opiate prescribed for medical reason documented by the Eligible Professional (e.g., headache pain refractory to other medications, severe headache, suspected or diagnosed herniated disk, fracture, sciatica, radiculopathy)
- Performance Not Met: Opiate prescribed, reason not specified

Numerator Exclusions: None

Denominator:
- Any patient ≥ 18 years of age evaluated by the Eligible Professional in the Emergency Department or Urgent Care Clinic (E/M Codes 99201-99205, 99212-99215, 99281-99285, 99291-99292 AND Place of Service Indicator: 11, 19, 20, 22 or 23) PLUS
- Diagnosis of low back pain OR
  - ICD-10: M54.5
- Diagnosis of migraine PLUS
  - ICD-10: G43.001, G43.009, G43.011, G43.019, G43.101, G43.109, G43.111, G43.119, G43.401, G43.409, G43.411, G43.419, G43.501, G43.509, G43.511, G43.519, G43.601, G43.609, G43.611, G43.619, G43.701, G43.709, G43.711, G43.719, G43.B0, G43.B1, G43.C0, G43.C1, G43.D0, G43.D1, G43.801, G43.809, G43.811, G43.819, G43.821, G43.829, G43.831, G43.839, G43.901, G43.909, G43.911, G43.919
- Disposition of Discharged
- Transferred, eloped, or AMA patients are excluded

Denominator Exclusions: None

Risk Adjustment: No

Rationale:
Low back pain and migraine headaches are two conditions that frequently present to the hospital for acute care and are conditions for which narcotic pain medication is not indicated according to national guidelines.

**Low back pain**
Acute low back pain is a common chief complaint in the Emergency Department. Opioids are frequently prescribed, expected, or requested for such presentations. (Friedman 2012, Friedman 2010) The opioid analgesics most commonly prescribed for low back pain, hydrocodone and oxycodone products, are also those most prevalent in a Government Accountability Office study of frequently abused drugs. (GAO 2011) Low back pain as a presenting complaint was also observed in a recent study to be associated with patients at higher risk for opioid abuse. (Sullivan 2010) Two meta-analyses have demonstrated no superiority for opioids over other therapies for treatment of acute low back pain, (MacIntosh 2011, Roelofs 2008) and several groups have recommended against use of opioids as first-line therapy for treatment of this problem. (Chou 2007, ACOEM 2007) A retrospective study found that workers with acute low back injury and worker’s compensation claims who were treated with prescription opioids within 6 weeks of acute injury for more than 7 days had a significantly higher risk for long-term disability. (Franklin 2008)

Several non-opioid pharmacologic therapies (including acetaminophen, NSAIDs, and selected antidepressants and anticonvulsants) are effective for chronic pain. In particular, acetaminophen and NSAIDs can be useful for arthritis and low back pain. (Dowell 2016) Non-opioid pharmacologic therapies are not generally associated with substance use disorder. (Jones 2013)

Many non-pharmacologic therapies, including physical therapy, weight loss and certain interventional procedures can ameliorate low back pain. There is high-quality evidence that exercise therapy (a prominent modality in physical therapy) reduces pain and improves function. (Hayden 2005) Multimodal therapies and multidisciplinary biopsychosocial rehabilitation approaches can reduce long-term pain and disability compared with usual care and compared with physical treatments (e.g., exercise) alone. Non-pharmacologic therapy and non-opioid pharmacologic therapy can be combined, as appropriate, to provide greater benefits to patients in improving pain and function.

**Migraine headaches**
According to guidelines released by the American Academy of Neurology and the American Headache Society, narcotic pain medications are not included as first-line treatments for migraine headaches. Instead, the following medications are established as effective and should be offered for migraine treatment prevention: (Silberstein 2012, Holland 2012)

- Antiepileptic drugs (AEDs): divalproex sodium, sodium valproate, topiramate
- β-Blockers: metoprolol, propranolol, timolol, atenolol, and nadolol
- Triptans: frovatriptan, naratriptan, and zolmitriptan for short-term MAMs prevention
- Antidepressants: amitriptyline, venlafaxine (but not SSRIs)
- NSAIDS: fenoprofen, ibuprofen, ketoprofen, naproxen, naproxen sodium

In 2016, the American Headache Society released guidelines for the management of adults with acute migraine in the emergency department. (Orr 2016, Silberstein 2016) They recommend intravenous metoclopramide, intravenous prochlorperazine, and subcutaneous
sumatriptan to treat these patients. Dexamethasone should be offered to these patients to prevent recurrence of headache, and they noted that opioids should be avoided (Orr 2016, Silberstein 2016). Although narcotics remain the most frequently administered medication for patients with migraine and for ED patients with headache, evidence suggests that they are potentially ineffective, and their use may lead to more prolonged ED stays. (Sahai-Srivastava 2008, Tornabene 2009)

Performance Gap:
A patient survey assessed headache types, comorbid conditions, and whether they had ever been prescribed opioids. (Minen 2015) With a predominant diagnosis of migraine (83.9%), more than half of the patients reported having been prescribed an opioid (54.8%). About one fifth were taking opioids (19.4%) at the time of completing the survey, and one quarter of patients reported taking opioids for more than 2 years (24.6%). The reason most frequently cited for stopping opioids was that they saw a new doctor who would not prescribe them (29.4%). The physician specialty most frequently cited as being the first prescriber for opioids was emergency medicine (20.2%), followed by family doctors and neurologists at 17.7% each. (Minen 2015)

To assess the extent of and factors associated with geographic variation in early opioid prescribing for acute, work-related, low back pain (LBP), national workers compensation administrative data filed from 2002-2003 was analyzed in a study. Of over 8,000 low back pain claimants, 21.3% received at least one early opioid prescription. Significant variation in prescribing practices was found between states was found, from 6% to 53%. Individual-level patient factors, including severity, explained only a small portion of the geographic variability. (Webster 2009)

Selected References:
• Food and Drug Administration. FDA drug safety communication: FDA strengthens warning


E-CPR (Emergency – Clinical Performance Registry) Measure #49

Measure Title: Avoidance of Tramadol or Codeine for Children

Inverse Measure: No

Measure Description: Percentage of Pediatric Patients Who Were Not Prescribed Tramadol or Codeine

National Quality Strategy Domain: Patient Safety

Type of Measure: Process, High Priority

Number of Performance Rates: 1

Measure Scoring: Proportion

Numerator: Pediatric Patients Who Were Not Dispensed or Prescribed Tramadol or Codeine

Definition:
- Medications containing tramadol or codeine include:
  - Codeine sulfate
  - Butalbital, acetaminophen, caffeine, and codeine phosphate
  - Fiorinal with codeine
  - Soma compound with codeine
  - Tylenol with codeine
  - Promethazine with codeine (cough)
  - Promethazine VC with codeine (cough)
  - Triacin-C (cough)
  - Tuxarin ER (cough)
  - Tuzistra-XR (cough)
  - Generic products containing codeine
  - Synalgos-DC (contains dihydrocodeine)
  - Conzip
  - Ultracet
  - Ultram
  - Ultram ER
  - Generic products containing tramadol

Numerator Options:
- Performance Met: Medication containing tramadol or codeine not dispensed or prescribed
- Performance Not Met: Medication containing tramadol or codeine dispensed or prescribed

Denominator:
Any patient < 18 years of age evaluated by the Eligible Professional in the Emergency Department or Urgent Care Clinic (E/M Codes 99201-99205, 99212-99215, 99281-99285, 99291-99292 AND Place of Service Indicator: 11, 19, 20, 22 or 23) PLUS

- Disposition of Discharged
- Transferred, eloped or AMA patients are excluded

Denominator Exclusions: None

Risk Adjustment: No

Rationale:
Codeine (3-methylmorphine) has had widespread use for more than 50 years as both an analgesic and antitussive agent. It was long considered the analgesic of choice for pediatric patients given the original perception that it was safe and the limited options for analgesic medications in the pediatric population. Codeine is a prodrug metabolized in the liver by the CYP2D6 enzyme. Due to significant genetic variation in ability to metabolize this prodrug, patients may have very different responses to the medication ranging from no effect to high sensitivity. Recent studies have demonstrated complications of respiratory depression and even death in ultrarapid metabolizers, which have predominantly been pediatric patients (Tobias 2016). Over the last 5 years, multiple organizations and regulatory bodies have either removed codeine as a recommended drug for pediatric patients or warned against its use.

Tramadol, which is a racemic opioid, had been used as an alternative to codeine in children. It is also metabolized in the liver by the cytochrome P450 CYP2D6 enzyme. Similar to codeine, concerns have arisen regarding respiratory depression in ultrarapid metabolizers of this drug. (Orliaguet 2014)

Since 2011, there has been a progressive change in recommendations regarding the use of codeine and tramadol. In August 2012, the FDA issued a safety alert regarding the use of codeine after adenotonsillectomy. In February 2013, the FDA then advanced their warning to a black box label which advised health care professionals to prescribe an alternative to codeine for postoperative pain control after adenotonsillectomy. In June 2013, the European Medicines Agency recommended the restriction of codeine for the treatment of pain in children. (Tobias 2016) Despite these recommendations, which were primarily focused on post-adenotonsillectomy pain, codeine and tramadol have continued to be used in the pediatric population. According to a study in 2011, codeine was prescribed to greater than 800,000 patients younger than 11 years of age (Racoosin). In April 2017, the US FDA issued a restriction on the use of codeine and tramadol use in children due the overwhelming concerns for respiratory depression and possible death.

Performance Gap:
An article published in Pediatrics in 2014 concluded that use of codeine prescriptions for cough or URI did not decline in the pediatric population despite national guidelines recommending against its use. (Kaiser 2014) Additionally, a study published in 2013 concluded that 43.3% of surveyed pediatric health care respondents continued to prescribe codeine for pain management. (Cartabuke 2013)

Selected References:
• Racoosin JA. Death and respiratory arrest related to ultra-rapid metabolism of codeine to morphine. www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/PediatricAdvisoryCommittee/UCM343601.pdf.
Measure Title: Avoidance of Creatine Kinase-MB (CK-MB) Testing for Non-traumatic Chest Pain

Inverse Measure: No

Measure Description: Percentage of Adult Patients with a Diagnosis of Non-traumatic Chest Pain Who Did Not Have CK-MB Lab Testing Ordered

National Quality Strategy Domain: Efficiency and Cost Reduction

Type of Measure: Process, High Priority

Reporting Measure: Percentage of Adult Patients with a Diagnosis of Non-traumatic Chest Pain Who Did Not Have CK-MB Lab Testing Ordered

Number of Performance Rates: 1

Measure Scoring: Proportion

Numerator: Patients who did not have CK-MB lab testing ordered

Numerator Options:
- Performance Met: CK-MB testing was not ordered
- Medical Performance Exclusion (Denominator Exception): CK-MB testing was ordered for medical reason documented by Eligible Professional (e.g., suspected acute myocardial re-infarction)
- Performance Not Met: CK-MB testing was ordered, reason not specified

Denominator:
- Any patient ≥ 18 years of age evaluated by the Eligible Professional in the Emergency Department (E/M Codes 99281-99285, 99291, 99292 AND Place of Service Indicator: 23) PLUS
- Transferred, eloped or AMA patients are excluded
- Patients with trauma are excluded

Denominator Exclusions: None

Risk Adjustment: No

Rationale:
Since 2000, the European Society of Cardiology (ESC) and the American College of Cardiology (ACC) recognized the pivotal role of biomarkers in diagnosis of acute myocardial infarction (AMI). At that time, they also acknowledged that cardiac troponin had supplanted CK-MB as the analyte of choice for diagnosis. More recent guidelines from the ESC, ACC, American Heart
Association (AHA), the American College of Emergency Physicians (ACEP), the Society for Cardiovascular Angiography and Interventions (SCAI) continue to recommend measurement of cardiac biomarkers at presentation in patients with suspected myocardial infarction (MI), and the only biomarker that is recommended to be used for the diagnosis of acute MI is cardiac troponin due to its superior sensitivity and accuracy (Amsterdam 2014, ACEP/SCAI/ACC/AHA 2013, Roffi 2016). The American Society for Clinical Pathology also recommends against testing for myoglobin or CK-MB in the diagnosis of acute myocardial infarction (AMI). Troponin is released before CK-MB and appears in the blood as early as, if not earlier than, myoglobin after AMI. Approximately 30% of patients experiencing chest discomfort at rest with a normal CK-MB will be diagnosed with AMI when evaluated using troponins. Accordingly, there is much support for relying solely on troponin and discontinuing the use of CK-MB and other markers. (Eggers 2004, Macrae 2006, Kavsak 2007, Saenger 2008, Reichlin 2009)

For example, patients with elevated troponin levels but negative creatine kinase-MB (CK-MB) values who were formerly diagnosed with unstable angina or minor myocardial injury are now reclassified as non-ST-elevation MI (NSTEMI), even in the absence of diagnostic electrocardiogram (ECG) changes. Similarly, only one elevated troponin level above the established cutoff is required to establish the diagnosis of acute MI, according to the ACC guidelines for NSTEMI. (ACEP/SCAI/ACC/AHA 2013, Anderson 2007, Anderson 2013) These changes were instituted following the introduction of increasingly sensitive and precise troponin assays. Up to 80% of patients with acute MI will have an elevated troponin level within 2-3 hours of emergency department (ED) arrival, compared to 6 or more hours for detection of elevated levels of CK-MB and other cardiac markers.

Cardiac troponin (cTn) assays are now considered the biomarkers of choice in the early diagnosis of AMI, especially in patients with a recent onset of chest pain. (Denese 2016, Reichlin 2009, Weber 2011, Keller 2009, Keller 2011) Most patients with an AMI can be reliably identified within 3 hours, with nearly 100% sensitivity and 100% negative predictive value using a cTn assay, which also reduces observation time in the ED to rule out of AMI. (Lippi 2016)

Performance Gap:
CK-MB testing is still ordered in many hospitals and emergency departments. (Alvin 2017) Despite the fact that the first ESC/ACC guideline came out defining AMI via troponin tests in 2000, an analysis of trends in Medicare Part B laboratory test volumes from 2000-2010 noted that CK-MB tests nearly doubled in volume during this same time frame. (Shahangian 2014)

Selected References:


E-CPR (Emergency – Clinical Performance Registry) Measure #50

**Measure Title:** Appropriate Use of Telemetry for Admission or Observation Placement

**Inverse Measure:** No

**Measure Description:** Percentage of Adult Patients with an Appropriate Diagnosis for Telemetry Admission or Observation Placement

**National Quality Strategy Domain:** Efficiency and Cost Reduction

**Type of Measure:** Process, High Priority

**Number of Performance Rates:** 1

**Measures Scoring:** Proportion

**Risk Adjustment:** No

**Numerator:** Patients Who Had Telemetry Monitoring Ordered for Admission or Observation with an Appropriate Diagnosis

**Numerator Options:**
- Performance Met: Patients who did have telemetry monitoring ordered, with admission diagnosis of the following:
  - Acute Coronary Syndrome (STEMI, NSTEMI, unstable angina) including evaluation for acute coronary syndrome
  - Chest pain
    - ICD-10: R07.1, R07.2, R07.81, R07.82, R07.89, R07.9
  - Resuscitation after cardiac arrest
    - ICD-10: I46.9
  - Postoperative/procedure period after cardiac surgery, cardiac ablation, AICD placement, pacemaker placement, cardiac catheterization with PCI
  - Initiation of antiarrhythmic drugs (see arrhythmias)
  - Electrolyte abnormalities potentially leading to acute EKG changes
    - Hyper/Hypokalemia ICD-10: E87.5, E87.6
    - Hyper/Hypocalcemia ICD-10: E83.52, E83.51
    - Hyper/Hypomagnesemia ICD-10: E83.41, E83.42
    - Metabolic acidosis (including DKA) ICD-10: E87.2, E87.4, E08.10, E08.11,
E09.10, E09.11, E10.10, E10.11, E11.10, E11.11, E13.10, E13.11

- Ischemic stroke or TIA

- Acute pericarditis or myocarditis
  - ICD-10: I01.0, I01.2, I02.0, I30.0, I30.1, I30.8, I30.9, I40.0, I40.1, I40.8, I40.9, I41

- Firing of AICD
  - ICD-10: T82.198A

- Acute heart failure
  - ICD-10: I50.21, I50.23, I50.31, I50.33, I50.41, I50.43, I50.811, I50.813, I50.9

- Acute pulmonary edema
  - ICD-10: J81.0

- Syncope
  - ICD-10: R55

- Cardiac arrhythmia (i.e., sick sinus syndrome, AV heart block, atrial fibrillation/flutter with RVR, bradycardia, sinus pause, prolonged QT syndrome, ventricular arrhythmias)
  - ICD-10: I44.0, I44.1, I44.2, I44.30, I44.39, I44.4, I44.5, I44.60, I44.69, I44.7, I45.0, I45.10, I45.19, I45.2, I45.3, I45.4, I45.5, I45.6, I45.81, I45.89, I45.9, I47.0, I47.1, I47.2, I47.9, I48.0, I48.1, I48.2, I48.3, I48.4, I48.91, I48.92, I49.01, I49.02, I49.1, I49.2, I49.3, I49.40, I49.49, I49.5, I49.8, I49.9, R00.1

- Acute poisoning with drugs or chemicals
  - ICD-10: T36-T65

- Acute pulmonary embolus

- Acute EKG changes
  - ICD-10: R94.31

- Hypoxemia
  - ICD-10: R09.02

- Shock
  - ICD-10: R57.0, R57.1, R57.8, R57.9

- Sepsis, Severe Sepsis, Septic Shock
  - ICD-10: A41.9, R65.20, R65.21

- Acute alcohol withdrawal

- Acute COPD exacerbation
  - ICD-10: J44.1
• Medical Performance Exclusion (Denominator Exception): Patients who did have telemetry monitoring ordered for medical reason documented by the Eligible Professional (e.g., medical conditions, procedures, or administration of medications that would place patient at risk for cardiac dysrhythmias)
• Performance Not Met: Patients who did have telemetry monitoring ordered, without appropriate diagnosis and reason not specified

Denominator:
• Any patient ≥18 years of age evaluated by the Eligible Professional (E/M Codes 99217-99220, 99221-99223, 99224-99226, 99231-99233, 99234-99236, 99238-99239, 99281-99285, & 99291-99292 AND Place of Service Indicator: 21, 23) PLUS
• Patients admitted to the inpatient service or observation status PLUS
• Order for Telemetry Monitoring
• Transferred, eloped or AMA patients excluded

Denominator Exclusions: None

Rationale:
Since its development in the mid-1960s and later implementation in healthcare settings, cardiac telemetry monitoring has been increasingly utilized. It is costly and labor-intensive. Despite guidelines that exist to focus telemetry utilization, many clinicians do not utilize them. As a result, telemetry monitoring is routinely and inappropriately utilized for patients who are low risk for life-threatening arrhythmias or sudden cardiac death. Inappropriate use of telemetry monitoring results in higher healthcare expenditure and unnecessary costs to patients. (Henriques-Forsythe 2009, Sivaram 1998)

Only a portion of licensed hospital beds allow for inpatient continuous cardiac telemetry monitoring. When physicians do not apply rigorous criteria for telemetry utilization, this resource can quickly become saturated, resulting in patients waiting in the emergency department for prolonged periods of time prior to admission. (Chen 2007) This results in emergency department boarding, which contributes to delays in care and increases patient morbidity and mortality.

Guidelines have been created to focus telemetry utilization on patients that are most likely to benefit from its use. The American College of Cardiology (ACC) and the American Heart Association (AHA) guidelines identify patient diagnoses, conditions, and procedures that place them at significant risk of an immediate life-threatening arrhythmia for which cardiac telemetry monitoring would be beneficial. (Drew 2004, Jaffe 1991). By systematically utilizing these criteria, physicians can reduce inappropriate utilization of telemetry monitoring; thereby reducing unnecessary costs to patients and improving the efficiency of patient care.

Selected References:
• Durairaj L, Reilly B, Das K, et al. Emergency department admissions to inpatient cardiac