

**2017 Hospitalist – Clinical Performance Registry (H-CPR)
Measure Specifications Manual**

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H-CPR (Hospitalist – Clinical Performance Registry) Measure #3

Measure Title: Mean Length of Stay for Inpatients – Pneumonia

Inverse Measure: Yes

Measure Description: Risk-Adjusted Mean LOS for All Inpatients Diagnosed with Pneumonia

National Quality Strategy Domain: Efficiency and Cost Reduction

Type of Measure: Outcome

Number of Performance Rates: 1

Measure Scoring: Continuous

Risk Adjustment: Yes

Numerator: [Note: This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we use this field to define the measure outcome.]

The Outcome for This Measure Is Mean Time (in Days) from Admission to Inpatient Status to Hospital Discharge for Pneumonia Patients

Denominator:

- Patients Evaluated by the Eligible Professional with E/M Codes 99221-99223, 99231-99233, 99238-99239, and 99291-99292 AND Place of Service Indicator: 21 (Note: please see weighting methodology below) PLUS
- LOS ≤ 120 days PLUS
- E/M admission code (99221, 99222 or 99223) AND E/M discharge code (99238 or 99239) by Eligible Professional or one of Eligible Professional's associates treating these patients PLUS
- Provider of record ("AI") modifier specified for Medicare patients with E/M Codes 99221-99223 or 99231-99233 PLUS
- Discharge diagnosis of pneumonia
 - **ICD-10:** J12.0, J12.1, J12.2, J12.81, J12.89, J12.9, J15.1, J14, J15.4, J15.4, J15.20, J15.211, J15.212, J15.29, J15.8, J15.5, J15.6, A48.1, J15.8, J15.9, J15.7, J16.0, J16.8, J18.0, J17, J11.00, J11.08
- Patients who expired during inpatient care or left AMA are excluded

Denominator Exclusions: None

Denominator Exceptions: None

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. Length of stay times are risk-adjusted for the overall and subgroups as continuous variables after normalization.

Risk-adjustment derivation:

Model: A regression model with fixed-effects (patient age, sex, and presence of co-morbidities) and DRG severity weight (CMS geometric mean LOS for the DRG) is used. Normal distribution is ensured and then a linear regression performed.

Dataset: The most current Health Care Utilization Project (HCUP) national dataset is utilized. This dataset contains over 20 million records per year and is a rich source for the derivation and validation of the model. The derivation dataset is a 75% random sample of the dataset. The co-morbidities are derived by mapping the ICD9/ICD10 to the relevant Charlson comorbidity index categories.

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 and observed/expected ratio.

Eligible Professional Weighting Methodology:

When multiple hospitalist Eligible Professionals have provided care during the patient’s inpatient stay (i.e. all contributing to a portion of the patient’s LOS), a weighting methodology is utilized to calculate the portion of the LOS attributed to each Eligible Professional on the case via the following formula:

$$\begin{aligned}
 \text{Observed LOS} &= \sum_{\text{All cases for which provider had} \geq 1 \text{ encounter}} \text{Attribution proportion} \times \text{Case LOS} \\
 &= \left(\frac{\text{Encounters by provider for case}}{\text{Total encounters for case}} \right) \times \text{Case LOS}
 \end{aligned}$$

$$\begin{aligned}
 \text{Expected LOS} &= \sum_{\text{All cases for which provider had} \geq 1 \text{ encounter}} \text{Attribution proportion} \times \text{Expected case LOS} \\
 &= \left(\frac{\text{Encounters by provider for case}}{\text{Total encounters for case}} \right) \times \text{Expected case LOS}
 \end{aligned}$$

Note: For purposes of weighting, encounters are defined as consisting of visit codes: 99221-99223, 99231-99233, 99238-99239, and 99291-99292.

Reporting Measure: Mean Time (in Days) from Admission to Inpatient Status to Hospital Discharge Observed/Expected Ratio

Rationale:

Universally hospitals across the United State utilize mean length of stay (LOS) measures as surrogate outcome measures for overall care because evidence-based inpatient medical care reduces hospital inpatient LOS while improving outcomes. Evidence-based hospital treatments of Congestive Heart Failure (CHF), Pneumonia (PNA) and Acute Exacerbations of Chronic Bronchitis (AECB) along with supportive care (e.g. venous thromboembolism prophylaxis) reduce hospital LOS, inpatient complications, and 30-day mortality rates. Elderly patients along

with those admitted for CHF, COPD, and AECB account for over 60% of inpatient admissions. Reducing inpatient LOS addresses utilization, improves hospital throughput, increases inpatient bed capacity, and reduces Emergency Department crowding.

Selected References:

- Landefeld CS. Care of hospitalized older patients: opportunities for hospital-based physicians. *J Hosp Med* 2006; 1:42.
- Wald H, Huddleston J, Kramer A. Is there a geriatrician in the house? Geriatric care approaches in hospitalist programs. *J Hosp Med* 2006; 1:29.
- Flaherty JH, Tariq SH, Raghavan S, et al. A model for managing delirious older inpatients. *J Am Geriatr Soc* 2003; 51:1031.
- Older patients treated with antipsychotics are at increased risk for developing aspiration pneumonia. *Curr Infect Dis Rep* 2011; 13:262.
- Arbaje AI, Maron DD, Yu Q, et al. The geriatric floating interdisciplinary transition team. *J Am Geriatr Soc* 2010; 58:364.
- Vidán M, Serra JA, Moreno C, et al. Efficacy of a comprehensive geriatric intervention in older patients hospitalized for hip fracture: a randomized, controlled trial. *J Am Geriatr Soc* 2005; 53:1476.
- Global strategy Wald H, Huddleston J, Kramer A. Is there a geriatrician in the house? Geriatric care approaches in hospitalist programs. *J Hosp Med* 2006; 1:29. for the diagnosis, management, and prevention of COPD: Revised 2014. Global initiative for Chronic obstructive lung disease (GOLD). <http://www.goldcopd.org> (Accessed on April 11, 2014).
- Stoller JK. Clinical practice. Acute exacerbations of chronic obstructive pulmonary disease. *N Engl J Med* 2002; 346:988.
- Ntoumenopoulos G. Using titrated oxygen instead of high flow oxygen during an acute exacerbation of chronic obstructive pulmonary disease (COPD) saves lives. *J Physiother* 2011; 57:55.
- Albert RK, Martin TR, Lewis SW. Controlled clinical trial of methylprednisolone in patients with chronic bronchitis and acute respiratory insufficiency. *Ann Intern Med* 1980; 92:753.
- Kiser TH, Allen RR, Valuck RJ, et al. Outcomes associated with corticosteroid dosage in critically ill patients with acute exacerbations of chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2014; 189:1052.
- Mandell LA, Wunderink RG, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis* 2007; 44 Suppl 2:S27
- McCabe, C, Kirchner, C, Zhang, H, et. al. Guideline-Concordant Therapy and Reduced Mortality and Length of Stay in Adults With Community-Acquired Pneumonia, *Arch Intern Med*. 2009;169(16):1525-1531
- Fine M, Pratt H, Obrosky DS, et.al. Relation between length of hospital stay and costs of care for patients with community-acquired pneumonia. *Am Jnl Med* 2000; 109: 378.
- National Quality Forum Measure #1611-Pneumonia Episode Treatment Group Cost of Care.
- Ashton CM, Kuykendall DH, Johnson ML, et al. The association between the quality of inpatient care and early readmission. *Ann Intern Med* 1995; 122:415.
- Konstam MA. Relating quality of care to clinical outcomes in heart failure: in search of the missing link. *J Card Fail* 2001; 7:299.
- Gheorghide M, Zannad F, Sopko G, et al. Acute heart failure syndromes: current state

and framework for future research. *Circulation* 2005; 112:3958.

- Heart Failure Society of America, Lindenfeld J, Albert NM, et al. HFSA 2010 Comprehensive Heart Failure Practice Guideline. *J Card Fail* 2010; 16:e1.
- Pines M, Hollander J, et. al. The Association between Emergency Department Crowding and Hospital Performance on Antibiotic Timing for Pneumonia and Percutaneous Intervention for Myocardial Infarction. *Acad Em Med* 2008; 13:873.
- Hiller D, Parry G, et. al. The Effect of Hospital Bed Occupancy on Throughput in the Pediatric Emergency Department. *Ann Emerg Med* 2009; 53:767

H-CPR (Hospitalist – Clinical Performance Registry) Measure #4

Measure Title: Mean Length of Stay for Inpatients – CHF

Inverse Measure: Yes

Measure Description: Risk-Adjusted Mean LOS for All Inpatients Diagnosed with Congestive Heart Failure (CHF)

National Quality Strategy Domain: Efficiency and Cost Reduction

Type of Measure: Outcome

Number of Performance Rates: 1

Measure Scoring: Continuous

Risk Adjustment: Yes

Numerator: [Note: This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we use this field to define the measure outcome.]

The Outcome for This Measure Is Mean Time (in Days) from Admission to Inpatient Status to Hospital Discharge for CHF Patients

Denominator:

- Patients Evaluated by the Eligible Professional with E/M Codes 99221-99223, 99231-99233, 99238-99239, and 99291-99292 AND Place of Service Indicator: 21 (Note: please see weighting methodology below) PLUS
- LOS ≤ 120 days PLUS
- E/M admission code (99221, 99222 or 99223) AND E/M discharge code (99238 or 99239) by Eligible Professional or one of Eligible Professional's associates treating these patients PLUS
- Provider of record ("AI") modifier specified for Medicare patients with E/M Codes 99221-99223 or 99231-99233 PLUS
- Discharge diagnosis of CHF
 - **ICD-10:** I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.32, I50.33, I50.40, I50.41, I50.42, I50.43, I50.9
- Patients who expired during inpatient care or left AMA are excluded

Denominator Exclusions: None

Denominator Exceptions: None

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. Length of stay times are risk-adjusted for the overall and subgroups as continuous variables after normalization.

Risk-adjustment derivation:

Model: A regression model with fixed-effects (patient age, sex, and presence of co-morbidities) and DRG severity weight (CMS geometric mean LOS for the DRG) is used. Normal distribution is ensured and then a linear regression performed.

Dataset: The most current Health Care Utilization Project (HCUP) national dataset is utilized. This dataset contains over 20 million records per year and is a rich source for the derivation and validation of the model. The derivation dataset is a 75% random sample of the dataset. The co-morbidities are derived by mapping the ICD9/ICD10 to the relevant Charlson comorbidity index categories.

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 and observed/expected ratio.

Eligible Professional Weighting Methodology:

When multiple hospitalist Eligible Professionals have provided care during the patient’s inpatient stay (i.e. all contributing to a portion of the patient’s LOS), a weighting methodology is utilized to calculate the portion of the LOS attributed to each Eligible Professional on the case via the following formula:

$$\begin{aligned}
 \text{Observed LOS} &= \sum_{\text{All cases for which provider had} \geq 1 \text{ encounter}} \text{Attribution proportion} \times \text{Case LOS} \\
 &= \left(\frac{\text{Encounters by provider for case}}{\text{Total encounters for case}} \right) \times \text{Case LOS}
 \end{aligned}$$

$$\begin{aligned}
 \text{Expected LOS} &= \sum_{\text{All cases for which provider had} \geq 1 \text{ encounter}} \text{Attribution proportion} \times \text{Expected case LOS} \\
 &= \left(\frac{\text{Encounters by provider for case}}{\text{Total encounters for case}} \right) \times \text{Expected case LOS}
 \end{aligned}$$

Note: For purposes of weighting, encounters are defined as consisting of visit codes: 99221-99223, 99231-99233, 99238-99239, and 99291-99292.

Reporting Measure: Mean Time (in Days) from Admission to Inpatient Status to Hospital Discharge Observed/Expected Ratio

Rationale:

Universally hospitals across the United State utilize mean length of stay (LOS) measures as surrogate outcome measures for overall care because evidence-based inpatient medical care reduces hospital inpatient LOS while improving outcomes. Evidence-based hospital treatments of Congestive Heart Failure (CHF), Pneumonia (PNA) and Acute Exacerbations of Chronic Bronchitis (AECB) along with supportive care (e.g. venous thromboembolism prophylaxis) reduce hospital LOS, inpatient complications, and 30-day mortality rates. Elderly patients along

with those admitted for CHF, COPD, and AECB account for over 60% of inpatient admissions. Reducing inpatient LOS addresses utilization, improves hospital throughput, increases inpatient bed capacity, and reduces Emergency Department crowding.

Selected References:

- Landefeld CS. Care of hospitalized older patients: opportunities for hospital-based physicians. *J Hosp Med* 2006; 1:42.
- Wald H, Huddleston J, Kramer A. Is there a geriatrician in the house? Geriatric care approaches in hospitalist programs. *J Hosp Med* 2006; 1:29.
- Flaherty JH, Tariq SH, Raghavan S, et al. A model for managing delirious older inpatients. *J Am Geriatr Soc* 2003; 51:1031.
- Older patients treated with antipsychotics are at increased risk for developing aspiration pneumonia. *Curr Infect Dis Rep* 2011; 13:262.
- Arbaje AI, Maron DD, Yu Q, et al. The geriatric floating interdisciplinary transition team. *J Am Geriatr Soc* 2010; 58:364.
- Vidán M, Serra JA, Moreno C, et al. Efficacy of a comprehensive geriatric intervention in older patients hospitalized for hip fracture: a randomized, controlled trial. *J Am Geriatr Soc* 2005; 53:1476.
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- Stoller JK. Clinical practice. Acute exacerbations of chronic obstructive pulmonary disease. *N Engl J Med* 2002; 346:988.
- Ntoumenopoulos G. Using titrated oxygen instead of high flow oxygen during an acute exacerbation of chronic obstructive pulmonary disease (COPD) saves lives. *J Physiother* 2011; 57:55.
- Albert RK, Martin TR, Lewis SW. Controlled clinical trial of methylprednisolone in patients with chronic bronchitis and acute respiratory insufficiency. *Ann Intern Med* 1980; 92:753.
- Kiser TH, Allen RR, Valuck RJ, et al. Outcomes associated with corticosteroid dosage in critically ill patients with acute exacerbations of chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2014; 189:1052.
- Mandell LA, Wunderink RG, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis* 2007; 44 Suppl 2:S27
- McCabe, C, Kirchner, C, Zhang, H, et. al. Guideline-Concordant Therapy and Reduced Mortality and Length of Stay in Adults With Community-Acquired Pneumonia, *Arch Intern Med*. 2009;169(16):1525-1531
- Fine M, Pratt H, Obrosky DS, et.al. Relation between length of hospital stay and costs of care for patients with community-acquired pneumonia. *Am Jnl Med* 2000; 109: 378.
- National Quality Forum Measure #1611-Pneumonia Episode Treatment Group Cost of Care.
- Ashton CM, Kuykendall DH, Johnson ML, et al. The association between the quality of inpatient care and early readmission. *Ann Intern Med* 1995; 122:415.
- Konstam MA. Relating quality of care to clinical outcomes in heart failure: in search of the missing link. *J Card Fail* 2001; 7:299.
- Gheorghide M, Zannad F, Sopko G, et al. Acute heart failure syndromes: current state

and framework for future research. *Circulation* 2005; 112:3958.

- Heart Failure Society of America, Lindenfeld J, Albert NM, et al. HFSA 2010 Comprehensive Heart Failure Practice Guideline. *J Card Fail* 2010; 16:e1.
- Pines M, Hollander J, et. al. The Association between Emergency Department Crowding and Hospital Performance on Antibiotic Timing for Pneumonia and Percutaneous Intervention for Myocardial Infarction. *Acad Em Med* 2008; 13:873.
- Hiller D, Parry G, et. al. The Effect of Hospital Bed Occupancy on Throughput in the Pediatric Emergency Department. *Ann Emerg Med* 2009; 53:767

H-CPR (Hospitalist – Clinical Performance Registry) Measure #5

Measure Title: Mean Length of Stay for Inpatients – COPD

Inverse Measure: Yes

Measure Description: Risk-Adjusted Mean LOS for All Inpatients Diagnosed with Chronic Obstructive Pulmonary Disease (COPD)

National Quality Strategy Domain: Efficiency and Cost Reduction

Type of Measure: Outcome

Number of Performance Rates: 1

Measure Scoring: Continuous

Risk Adjustment: Yes

Numerator: [Note: This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we use this field to define the measure outcome.]

The Outcome for This Measure Is Mean Time (in Days) from Admission to Inpatient Status to Hospital Discharge for COPD Patients

Denominator:

- Patients Evaluated by the Eligible Professional with E/M Codes 99221-99223, 99231-99233, 99238-99239, and 99291-99292 AND Place of Service Indicator: 21 (Note: please see weighting methodology below) PLUS
- LOS ≤ 120 days PLUS
- E/M admission code (99221, 99222 or 99223) AND E/M discharge code (99238 or 99239) by Eligible Professional or one of Eligible Professional's associates treating these patients PLUS
- Provider of record ("AI") modifier specified for Medicare patients with E/M Codes 99221-99223 or 99231-99233 PLUS
- Discharge diagnosis of COPD
 - **ICD-10:** J41.0, J41.1, J41.8, J42, J43.0, J43.1, J43.2, J43.8, J43.9, J44.0, J44.1, J44.9
- Patients who expired during inpatient care or left AMA excluded

Denominator Exclusions: None

Denominator Exceptions: None

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. Length of stay times are risk-adjusted for the overall and subgroups as continuous variables after normalization.

Risk-adjustment derivation:

Model: A regression model with fixed-effects (patient age, sex, and presence of co-morbidities) and DRG severity weight (CMS geometric mean LOS for the DRG) is used. Normal distribution is ensured and then a linear regression performed.

Dataset: The most current Health Care Utilization Project (HCUP) national dataset is utilized. This dataset contains over 20 million records per year and is a rich source for the derivation and validation of the model. The derivation dataset is a 75% random sample of the dataset. The co-morbidities are derived by mapping the ICD9/ICD10 to the relevant Charlson comorbidity index categories.

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 and observed/expected ratio.

Eligible Professional Weighting Methodology:

When multiple hospitalist Eligible Professionals have provided care during the patient’s inpatient stay (i.e. all contributing to a portion of the patient’s LOS), a weighting methodology is utilized to calculate the portion of the LOS attributed to each Eligible Professional on the case via the following formula:

$$\begin{aligned}
 \text{Observed LOS} &= \sum_{\text{All cases for which provider had } \geq 1 \text{ encounter}} \text{Attribution proportion} \times \text{Case LOS} \\
 &= \left(\frac{\text{Encounters by provider for case}}{\text{Total encounters for case}} \right) \times \text{Case LOS}
 \end{aligned}$$

$$\begin{aligned}
 \text{Expected LOS} &= \sum_{\text{All cases for which provider had } \geq 1 \text{ encounter}} \text{Attribution proportion} \times \text{Expected case LOS} \\
 &= \left(\frac{\text{Encounters by provider for case}}{\text{Total encounters for case}} \right) \times \text{Expected case LOS}
 \end{aligned}$$

Note: For purposes of weighting, encounters are defined as consisting of visit codes: 99221-99223, 99231-99233, 99238-99239, and 99291-99292.

Reporting Measure: Mean Time (in Days) from Admission to Inpatient Status to Hospital Discharge Observed/Expected Ratio

Rationale:

Universally hospitals across the United State utilize mean length of stay (LOS) measures as surrogate outcome measures for overall care because evidence-based inpatient medical care reduces hospital inpatient LOS while improving outcomes. Evidence-based hospital treatments of Congestive Heart Failure (CHF), Pneumonia (PNA) and Acute Exacerbations of Chronic Bronchitis (AECB) along with supportive care (e.g. venous thromboembolism prophylaxis)

reduce hospital LOS, inpatient complications, and 30-day mortality rates. Elderly patients along with those admitted for CHF, COPD, and AECB account for over 60% of inpatient admissions. Reducing inpatient LOS addresses utilization, improves hospital throughput, increases inpatient bed capacity, and reduces Emergency Department crowding.

Selected References:

- Landefeld CS. Care of hospitalized older patients: opportunities for hospital-based physicians. *J Hosp Med* 2006; 1:42.
- Wald H, Huddleston J, Kramer A. Is there a geriatrician in the house? Geriatric care approaches in hospitalist programs. *J Hosp Med* 2006; 1:29.
- Flaherty JH, Tariq SH, Raghavan S, et al. A model for managing delirious older inpatients. *J Am Geriatr Soc* 2003; 51:1031.
- Older patients treated with antipsychotics are at increased risk for developing aspiration pneumonia. *Curr Infect Dis Rep* 2011; 13:262.
- Arbaje AI, Maron DD, Yu Q, et al. The geriatric floating interdisciplinary transition team. *J Am Geriatr Soc* 2010; 58:364.
- Vidán M, Serra JA, Moreno C, et al. Efficacy of a comprehensive geriatric intervention in older patients hospitalized for hip fracture: a randomized, controlled trial. *J Am Geriatr Soc* 2005; 53:1476.
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- Stoller JK. Clinical practice. Acute exacerbations of chronic obstructive pulmonary disease. *N Engl J Med* 2002; 346:988.
- Ntoumenopoulos G. Using titrated oxygen instead of high flow oxygen during an acute exacerbation of chronic obstructive pulmonary disease (COPD) saves lives. *J Physiother* 2011; 57:55.
- Albert RK, Martin TR, Lewis SW. Controlled clinical trial of methylprednisolone in patients with chronic bronchitis and acute respiratory insufficiency. *Ann Intern Med* 1980; 92:753.
- Kiser TH, Allen RR, Valuck RJ, et al. Outcomes associated with corticosteroid dosage in critically ill patients with acute exacerbations of chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2014; 189:1052.
- Mandell LA, Wunderink RG, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis* 2007; 44 Suppl 2:S27
- McCabe, C, Kirchner, C, Zhang, H, et. al. Guideline-Concordant Therapy and Reduced Mortality and Length of Stay in Adults With Community-Acquired Pneumonia, *Arch Intern Med*. 2009;169(16):1525-1531
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- National Quality Forum Measure #1611-Pneumonia Episode Treatment Group Cost of Care.
- Ashton CM, Kuykendall DH, Johnson ML, et al. The association between the quality of inpatient care and early readmission. *Ann Intern Med* 1995; 122:415.
- Konstam MA. Relating quality of care to clinical outcomes in heart failure: in search of the missing link. *J Card Fail* 2001; 7:299.

- Gheorghiade M, Zannad F, Sopko G, et al. Acute heart failure syndromes: current state and framework for future research. *Circulation* 2005; 112:3958.
- Heart Failure Society of America, Lindenfeld J, Albert NM, et al. HFSA 2010 Comprehensive Heart Failure Practice Guideline. *J Card Fail* 2010; 16:e1.
- Pines M, Hollander J, et. al. The Association between Emergency Department Crowding and Hospital Performance on Antibiotic Timing for Pneumonia and Percutaneous Intervention for Myocardial Infarction. *Acad Em Med* 2008; 13:873.
- Hiller D, Parry G, et. al. The Effect of Hospital Bed Occupancy on Throughput in the Pediatric Emergency Department. *Ann Emerg Med* 2009; 53:767

H-CPR (Hospitalist – Clinical Performance Registry) Measure #19

Referenced 2017 CMS Hospital Inpatient Measure READM-30-HWR Specifications

Measure Title: 30 Day All Cause Readmission Rate for Discharged Inpatients

Inverse Measure: Yes

Measure Description: Risk-Standardized Rate of All-cause Readmission to the Discharging Hospital and Hospitalist Physician Group within 30 Days of Initial Hospital Discharge

National Quality Strategy Domain: Communication and Care Coordination

Type of Measure: Outcome

Number of Performance Rates: 4

1. Readmission Rate for All Discharged Inpatients (*Overall Reporting Rate*)
2. Readmission Rate for Discharged Pneumonia Patients
3. Readmission Rate for Discharged CHF Patients
4. Readmission Rate for Discharged COPD Patients

Measure Scoring: Proportion

Risk Adjustment: Yes

Numerator: [Note: This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we use this field to define the measure outcome.]

The Outcome for This Measure Is All-cause Readmission within 30 Days of Hospital Discharge

- Readmission Definition: An Inpatient Admission (E/M Codes 99221-99223, or 99291 AND Place of Service Indicator: 21) to the Hospital and Hospitalist Physician Group Initially Discharging the Patient That Occurs Within 30 days of the Discharge Date of an Earlier Index Admission. All Causes of Readmissions Are Counted as Outcomes.

Denominator:

- Patients Admitted to Inpatient Status on Index Admission PLUS
- Patients Discharged by the Eligible Professional on Index Admission (E/M Codes 99238-99239 AND Place of Service Indicator: 21)
- Patients who expired, were discharged AMA or transferred to another acute care hospital during initial inpatient admission are excluded
- Patients with any planned readmission are excluded

Denominator Exclusions: None

Denominator Exceptions: None

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. Readmissions are risk-adjusted as a binary outcome.

Risk-adjustment derivation:

Model: A regression model with fixed-effects (patient age, sex, and presence of co-morbidities) and DRG severity weight (CMS geometric mean LOS for the DRG) is used. Normal distribution is ensured and then a logistic regression performed.

Dataset: The most current Health Care Utilization Project (HCUP) national dataset is utilized. This dataset contains over 20 million records per year and is a rich source for the derivation and validation of the model. The derivation dataset is a 75% random sample of the dataset. The co-morbidities are derived by mapping the ICD9/ICD10 to the relevant Charlson comorbidity index categories.

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.

Reporting Measure: All-cause Readmission to the Discharging Hospital and Hospitalist Physician Group within 30 Days of Initial Hospital Discharge Observed/Expected Ratio

Rationale:

(Referenced from 2017 CMS Hospital Inpatient Measure READM-30-HWR Specifications)
The hospital-wide all-cause readmission (HWR) measure reports the hospital-level, risk-standardized rate of all-cause unplanned readmission within 30 days of hospital discharge. A hospital's readmission rate is related to complex and critical aspects of care such as communication between providers; prevention of and response to complications; patient safety; and coordinated transitions to the outpatient environment. While the condition-specific measures of readmission are helpful for assessing the quality of care for specific groups of patients, they account for only a small minority of total readmissions (Jencks et al., 2009). By contrast, a hospital-wide, all-condition readmission measure provides a broad sense of the quality of care at hospitals and will reflect the full benefit of hospital-wide efforts to improve care and care transitions.

Given that studies have shown readmissions to be related to quality of care, and that interventions have been able to reduce 30-day readmission rates, it is reasonable to consider an all-condition readmission rate as a quality measure.

Finally, readmission rates are influenced by the quality of inpatient and outpatient care, the availability and use of effective disease management programs, and the bed capacity of the local health care system. Some of the variation in readmissions may be attributable to delivery system characteristics (Fisher et al., 1994). Also, interventions during and after a hospitalization can be effective in reducing readmission rates in geriatric populations generally (Benbassat & Taragin, 2000; Naylor et al., 1999; Coleman et al., 2006). Tracking readmissions also emphasizes improvement in care transitions and care coordination. Although discharge planning is required by Medicare as a condition of participation for hospitals, transitional care focuses more broadly on "hand-offs" of care from one setting to another, and may have implications for quality and costs (Coleman, 2005).

Selected References: (Referenced from 2017 CMS Hospital Inpatient Measure READM-30-HWR Specifications)

- Benbassat J, Taragin M. Hospital readmissions as a measure of quality of health care: advantages and limitations. *Archives of Internal Medicine* 2000;160(8):1074-81.
- Coleman EA, Smith JD, Frank JC, Min SJ, Parry C, Kramer AM. Preparing patients and caregivers to participate in care delivered across settings: the Care Transitions Intervention. *J Am Geriatr Soc* 2004;52(11):1817-25.
- Courtney M, Edwards H, Chang A, Parker A, Finlayson K, Hamilton K. Fewer emergency readmissions and better quality of life for older adults at risk of hospital readmission: a randomized controlled trial to determine the effectiveness of a 24-week exercise and telephone follow-up program. *J Am Geriatr Soc* 2009;57(3):395-402.
- Garasen H, Windspoll R, Johnsen R. Intermediate care at a community hospital as an alternative to prolonged general hospital care for elderly patients: a randomised controlled trial. *BMC Public Health* 2007;7:68.
- Jack BW, Chetty VK, Anthony D, Greenwald JL, Sanchez GM, Johnson AE, et al. A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. *Ann Intern Med* 2009;150(3):178-87.
- Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. *New England Journal of Medicine* 2009;360(14):1418-28.
- Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. *New England Journal of Medicine* 2009;360(14):1418-28.
- Koehler BE, Richter KM, Youngblood L, Cohen BA, Prengler ID, Cheng D, et al. Reduction of 30-day postdischarge hospital readmission or emergency department (ED) visit rates in high-risk elderly medical patients through delivery of a targeted care bundle. *J Hosp Med* 2009;4(4):211-218.
- Krumholz HM, Amatruda J, Smith GL, et al. Randomized trial of an education and support intervention to prevent readmission of patients with heart failure. *J Am Coll Cardiol*. Jan 2 2002;39(1):83-89.
- Medicare Payment Advisory Commission (U.S.). Report to the Congress promoting greater efficiency in Medicare. Washington, DC: Medicare Payment Advisory Commission, 2007.
- Medicare Payment Advisory Commission (U.S.). Report to the Congress promoting greater efficiency in Medicare. Washington, DC: Medicare Payment Advisory Commission, 2007.
- Mistiaen P, Francke AL, Poot E. Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systematic metareview. *BMC Health Serv Res* 2007;7:47.
- Naylor M, Brooten D, Jones R, Lavizzo-Mourey R, Mezey M, Pauly M. Comprehensive discharge planning for the hospitalized elderly. A randomized clinical trial. *Ann Intern Med* 1994;120(12):999-1006.
- Naylor MD, Brooten D, Campbell R, Jacobsen BS, Mezey MD, Pauly MV, et al. Comprehensive discharge planning and home follow-up of hospitalized elders: a randomized clinical trial. *Jama* 1999;281(7):613-20.
- Normand S-LT, Shahian DM. 2007. Statistical and Clinical Aspects of Hospital Outcomes Profiling. *Stat Sci* 22 (2): 206-226.
- Pope, G., et al., Principal Inpatient Diagnostic Cost Group Models for Medicare Risk Adjustment. *Health Care Financing Review*, 2000. 21(3): 26.

- van Walraven C, Seth R, Austin PC, Laupacis A. Effect of discharge summary availability during post-discharge visits on hospital readmission. *J Gen Intern Med* 2002;17(3):186-92.
- Weiss M, Yakusheva O, Bobay K. Nurse and patient perceptions of discharge readiness in relation to postdischarge utilization. *Med Care* 2010;48(5):482-6.
- Why Not the Best? Results from a National Scorecard on U.S. Health System Performance. Fund Report. Harrisburg, PA: The Commonwealth Fund, 2006.

H-CPR (Hospitalist – Clinical Performance Registry) Measure #13

Adopted from 2017 Specifications Manual for National Hospital Quality Measure STK-1

Measure Title: Stroke Venous Thromboembolism (VTE) Prophylaxis

Inverse Measure: No

Measure Description: Percentage of Adult Ischemic and Hemorrhagic Stroke Patients Who Had VTE Prophylaxis Ordered on the Day Of or the Day After Hospital Admission OR Have Documentation of Why No VTE Prophylaxis Was Ordered

National Quality Strategy Domain: Patient Safety

Type of Measure: Process

Number of Performance Rates: 1

Measure Scoring: Proportion

Risk Adjustment: No

Numerator: Ischemic or hemorrhagic stroke patients who had VTE prophylaxis ordered on the day of or the day after hospital admission OR have documentation why no VTE prophylaxis was ordered on the day of or the day after hospital admission

- Performance Met (either of below qualify):
 - Acceptable VTE Prophylaxis (Note: This is not meant to be an inclusive list of all available prophylaxis; rather it represents current information available at the time of publication):
 - Pharmacologic Prophylaxis: Low dose unfractionated heparin (LDUH), Low molecular weight heparin (LMWH), Warfarin/Coumadin, IV Factor Xa Inhibitor such as Arixtra/Fondaparinux, Oral Factor Xa Inhibitor such as Xarelto/Rivaroxaban (must document why oral factor Xa was used for VTE Prophylaxis [acceptable reasons are: Atrial fibrillation, Atrial flutter, Hip arthroplasty/replacement, Total knee arthroplasty/replacement, or history of treatment for VTE or current VTE treatment])
 - Mechanical Prophylaxis: Intermittent pneumatic compression devices (IPC), Graduated compression stockings (GCS), Venous foot pumps (VFP)
 - Acceptable Reason(s) for No VTE Prophylaxis:
 - There is explicit documentation indicating that the patient is at low risk for VTE (i.e. Patient at low risk for VTE, No VTE Prophylaxis needed) OR
 - There is explicit documentation of a contraindication to both mechanical prophylaxis AND documentation of a contraindication to pharmacological prophylaxis.
- Performance Not Met: No VTE prophylaxis ordered on the day of or the day after hospital admission AND no documentation why no VTE prophylaxis was ordered on the day of or the day after hospital admission

Denominator:

- Patients ≥ 18 years of age evaluated by the Eligible Professional (E/M Codes 99221-99223, 99231-99233, 99238-99239, and 99291-99292 AND Place of Service Indicator: 21) PLUS
- LOS ≥ 2 days and ≤ 120 days PLUS
- Provider of record (“AI”) modifier specified for Medicare patients with E/M Codes 99221-99223 or 99231-99233 PLUS
- Diagnosis of Ischemic or Hemorrhagic CVA
 - **ICD-10:** I65.1, I65.21, I65.22, I65.23, I65.29, I63.23, I63.231, I63.232, I63.239, I65.0, I65.01, I65.02, I65.03, I65.09, I63.21, I63.211, I63.212, I63.219, I65.8, I65.9, I66.9, I63.50, I63.40, I60.9, I61.9
- Patients with Comfort Measures Only documented on day of or day after hospital arrival are excluded
- Patients enrolled in clinical trials are excluded
- Patients admitted for Elective Carotid Intervention are excluded

Denominator Exclusions: None

Denominator Exceptions: None

Rationale:

(Adopted from 2017 Specifications Manual for National Hospital Quality Measure STK-1)
Stroke patients are at increased risk of developing venous thromboembolism (VTE). One study noted proximal deep vein thrombosis in more than a third of patients with moderately severe stroke. Reported rates of occurrence vary depending on the type of screening used. Prevention of VTE, through the use of prophylactic therapies, in at risk patients is a noted recommendation in numerous clinical practice guidelines. For acutely ill stroke patients who are confined to bed, thromboprophylaxis with low-molecular-weight heparin (LMWH), low-dose unfractionated heparin (LDUH), or fondaparinux is recommended if there are no contraindications. Aspirin alone is not recommended as an agent to prevent VTE.

Selected References: (Adopted from 2017 Specifications Manual for National Hospital Quality Measure STK-1)

- Adams, H.P., G. del Zoppo, M. J. Alberts, D. L. Bhatt, L. Brass, A. Furlan, R. L. Grubb, *et al.* "Guidelines for the Early Management of Adults with Ischemic Stroke: A Guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups." *Stroke* 38 (2007): 1655-711.
- Albers, G. W, P Amarenco, J. D. Easton, R. L. Sacco, and P. Teal. "Antithrombotic and Thrombolytic Therapy for Ischemic Stroke." *Chest* 119 (2001): 300-20.
- Caprini, J. A., and J. I. Arcelus. "State-of the Art Venous Thromboembolism Prophylaxis." *SCOPE on Phlebology & Lymphology* 1 (2005): 228-40.
- Centers for Disease Control and Prevention. "Prevalence and Most Common Causes of Disability among Adults--United States, 2005." [In eng]. *MMWR Morb Mortal Wkly Rep* 58, no. 16 (May 1 2009): 421-6.
- Coull, B. M., L. S. Williams, L. B. Goldstein, J. F. Meschia, D. Heitzman, S. Chaturvedi, K. C. Johnston, *et al.* "Anticoagulants and Antiplatelet Agents in Acute Ischemic Stroke: Report of the Joint Stroke Guideline Development Committee of the American Academy

- of Neurology and the American Stroke Association (a Division of the American Heart Association)." [In eng]. *Stroke* 33, no. 7 (Jul 2002): 1934-42.
- Desmukh, M., M. Bisignami, P. Landau, and T. J. Orchard. "Deep Vein Thrombosis in Rehabilitating Stroke Patients: Incidence, Risk Factors and Prophylaxis." *American Journal Physical Medicine Rehabilitation* 70 (1991): 313-16.
 - Duncan, P. W., R. Zorowitz, B. Bates, J. Y. Choi, J. J. Glasberg, G. D. Graham, R. C. Katz, K. Lamberty, and D. Reker. "Management of Adult Stroke Rehabilitation Care: A Clinical Practice Guideline." [In eng]. *Stroke* 36, no. 9 (Sep 2005): e100-43.
 - Geerts, W. H., D. Bergqvist, G. F. Pineo, J. A. Heit, C. M. Samama, M. R. Lassen, C. W. Colwell, and Physicians American College of Chest. "Prevention of Venous Thromboembolism: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition)." [In eng]. *Chest* 133, no. 6 Suppl (Jun 2008): 381S-453S.
 - Geerts, W. H., J. A. Heit, G. P. Clagett, G. F. Pineo, C. W. Colwell, F. A. Anderson, Jr., and H. B. Wheeler. "Prevention of Venous Thromboembolism." [In eng]. *Chest* 119, no. 1 Suppl (Jan 2001): 132S-75S.
 - Geerts, W. H., G. F. Pineo, J. A. Heit, D. Bergqvist, M. R. Lassen, C. W. Colwell, and J. G. Ray. "Prevention of Venous Thromboembolism: The Seventh Accp Conference on Antithrombotic and Thrombolytic Therapy." [In eng]. *Chest* 126, no. 3 Suppl (Sep 2004): 338S-400S.
 - Gresham, G. E., P. W. Duncan, W. B. Stason, H. P. Adams, A. M. Adelman, D. N. Alexander, D. S. Bishop et al. "Post-stroke rehabilitation. Clinical practice guideline, no. 16. Rockville, MD: US Department of Health and Human Services." *Public Health Service, Agency for Health Care Policy and Research* (1995): 95-0062.
 - Guyatt, G. H., E. A. Akl, M. Crowther, D. D. Gutterman, H. J. Schunemann, Therapy American College of Chest Physicians Antithrombotic, and Panel Prevention of Thrombosis. "Executive Summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th Ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines." [In eng]. *Chest* 141, no. 2 Suppl (Feb 2012): 7S-47S.
 - Heit, J. A. "The Epidemiology of Venous Thromboembolism in the Community." [In eng]. *Arterioscler Thromb Vasc Biol* 28, no. 3 (Mar 2008): 370-2.
 - Jauch, E. C., J. L. Saver, H. P. Adams, Jr., A. Bruno, J. J. Connors, B. M. Demaerschalk, P. Khatri, et al. "Guidelines for the Early Management of Patients with Acute Ischemic Stroke: A Guideline for Healthcare Professionals from the American Heart Association/American Stroke Association." [In Eng]. *Stroke* (Jan 31 2013).
 - Kase, C. S., G. W. Albers, C. Bladin, C. Fieschi, A. A. Gabbai, W. O'Riordan, G. F. Pineo, and Prevail Investigators. "Neurological Outcomes in Patients with Ischemic Stroke Receiving Enoxaparin or Heparin for Venous Thromboembolism Prophylaxis: Subanalysis of the Prevention of Vte after Acute Ischemic Stroke with Lmwh (Prevail) Study." [In eng]. *Stroke* 40, no. 11 (Nov 2009): 3532-40.
 - Kase, C. S., and G. F. Pineo. "Prevention of Venous Thromboembolism after Ischemic Stroke." [In eng]. *Curr Opin Pulm Med* 14, no. 5 (Sep 2008): 389-96.
 - Kelly, J., A. Rudd, R. Lewis, and B. J. Hunt. "Venous Thromboembolism after Acute Stroke." [In eng]. *Stroke* 32, no. 1 (Jan 2001): 262-7.
 - Kelly, J., A. Rudd, R. R. Lewis, C. Coshall, A. Moody, and B. J. Hunt. "Venous Thromboembolism after Acute Ischemic Stroke: A Prospective Study Using Magnetic Resonance Direct Thrombus Imaging." [In eng]. *Stroke* 35, no. 10 (Oct 2004): 2320-5.
 - Kucher, N., S. Koo, R. Quiroz, J. M. Cooper, M. D. Paterno, B. Soukonnikov, and S. Z. Goldhaber. "Electronic Alerts to Prevent Venous Thromboembolism among Hospitalized

- Patients." [In eng]. *N Engl J Med* 352, no. 10 (Mar 10 2005): 969-77.
- "Making Healthcare Safer: A Critical Analysis of Patient Safety Practices." In *Evidence Report/Technology Assessment # 43*. Rockville, MD: Agency for Healthcare Research and Quality, July 2001.
 - Michota, F. A. "Venous Thromboembolism Prophylaxis in Medical Patients." [In eng]. *Curr Opin Cardiol* 19, no. 6 (Nov 2004): 570-4.
 - Naccarato, M., F. Chiodo Grandi, M. Dennis, and P. A. Sandercock. "Physical Methods for Preventing Deep Vein Thrombosis in Stroke." [In eng]. *Cochrane Database Syst Rev*, no. 8 (2010): CD001922.
 - National Heart, Lung, and Blood Institute, and National Institutes of Health. "Stroke Belt Initiative: Project Accomplishments and Lessons Learned." (1996).
 - Pineo, G., J. Lin, L. Stern, T. Subrahmanian, and L. Annemans. "Economic Impact of Enoxaparin Versus Unfractionated Heparin for Venous Thromboembolism Prophylaxis in Patients with Acute Ischemic Stroke: A Hospital Perspective of the Prevail Trial." [In eng]. *J Hosp Med* 7, no. 3 (Mar 2012): 176-82.
 - Raskob, G. E., R. Silverstein, D. W. Bratzler, J. A. Heit, and R. H. White. "Surveillance for Deep Vein Thrombosis and Pulmonary Embolism: Recommendations from a National Workshop." [In eng]. *Am J Prev Med* 38, no. 4 Suppl (Apr 2010): S502-9.
 - Roger, V. L., A. S. Go, D. M. Lloyd-Jones, E. J. Benjamin, J. D. Berry, W. B. Borden, D. M. Bravata, et al. "Heart Disease and Stroke Statistics--2012 Update: A Report from the American Heart Association." [In eng]. *Circulation* 125, no. 1 (Jan 3 2012): e2-e220.
 - Sacco, R. L., R. Adams, G. Albers, M. J. Alberts, O. Benavente, K. Furie, L. B. Goldstein, et al. "Guidelines for Prevention of Stroke in Patients with Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals from the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention: The American Academy of Neurology Affirms the Value of This Guideline." [In eng]. *Stroke* 37, no. 2 (Feb 2006): 577-617.
 - Sandercock, P. A., C. Counsell, and M. C. Tseng. "Low-Molecular-Weight Heparins or Heparinoids Versus Standard Unfractionated Heparin for Acute Ischaemic Stroke ". *Cochrane Database Syst Rev*, no. 3 (2011): CD000119.
 - Stein, P. D., and F. Matta. "Epidemiology and Incidence: The Scope of the Problem and Risk Factors for Development of Venous Thromboembolism." [In eng]. *Clin Chest Med* 31, no. 4 (Dec 2010): 611-28.
 - Vergouwen, M. D., Y. B. Roos, and P. W. Kamphuisen. "Venous Thromboembolism Prophylaxis and Treatment in Patients with Acute Stroke and Traumatic Brain Injury." [In eng]. *Curr Opin Crit Care* 14, no. 2 (Apr 2008): 149-55.
 - Warlow, C., D. Ogston, and A. S. Douglas. "Deep Venous Thrombosis of the Legs after Strokes. Part I--Incidence and Predisposing Factors." [In eng]. *Br Med J* 1, no. 6019 (May 15 1976): 1178-81.
 - Wijdicks, E. F., and J. P. Scott. "Pulmonary Embolism Associated with Acute Stroke." [In eng]. *Mayo Clin Proc* 72, no. 4 (Apr 1997): 297-300.

H-CPR (Hospitalist – Clinical Performance Registry) Measure #14

Adopted from 2017 Specifications Manual for National Hospital Quality Measure VTE-1

Measure Title: Venous Thromboembolism (VTE) Prophylaxis

Inverse Measure: No

Measure Description: Percentage of Adult Patients Who Had VTE Prophylaxis Ordered on the Day Of or the Day After Hospital Admission OR Have Documentation of Why No VTE Prophylaxis Was Ordered

National Quality Strategy Domain: Patient Safety

Type of Measure: Process

Number of Performance Rates: 1

Measure Scoring: Proportion

Risk Adjustment: No

Numerator: Patients who had VTE prophylaxis ordered on the day of or the day after hospital admission OR have documentation why no VTE prophylaxis was ordered on the day of or the day after hospital admission

Numerator Options

- Performance Met (either of below qualify):
 - Acceptable VTE Prophylaxis (Note: This is not meant to be an inclusive list of all available anticoagulants; rather it represents current information available at the time of publication):
 - Pharmacologic Prophylaxis: Low dose unfractionated heparin (LDUH), Low molecular weight heparin (LMWH), Warfarin/Coumadin, IV Factor Xa Inhibitor such as Arixtra/Fondaparinux, Oral Factor Xa Inhibitor such as Xarelto/Rivaroxaban (must document why oral factor Xa was used for VTE Prophylaxis [acceptable reasons are: Atrial fibrillation, Atrial flutter, Hip arthroplasty/replacement, Total knee arthroplasty/replacement, or history of treatment for VTE or current VTE treatment])
 - Mechanical Prophylaxis: Intermittent pneumatic compression devices (IPC), Graduated compression stockings (GCS), Venous foot pumps (VFP)
 - Acceptable Reason(s) For No VTE Prophylaxis:
 - There is explicit documentation indicating that the patient is at low risk for VTE (i.e. Patient at low risk for VTE, No VTE Prophylaxis needed) OR
 - There is explicit documentation of a contraindication to both mechanical prophylaxis AND documentation of a contraindication to pharmacological prophylaxis.
- Performance Not Met: No VTE prophylaxis ordered on the day of or the day after hospital admission AND no documentation why no VTE prophylaxis was ordered on the day of or the day after hospital admission

Denominator:

- Inpatients \geq 18 years of age evaluated by the Eligible Professional (E/M Codes 99221-

99223, 99231-99233, 99238-99239, 99291-99292 AND Place of Service Indicator: 21)
PLUS

- LOS \geq 2 days and \leq 120 days PLUS
- Provider of record (“AI”) modifier specified for Medicare patients with E/M Codes 99221-99223 or 99231-99233
- Patients with Comfort Measures Only documented on day of or day after hospital arrival are excluded
- Patients enrolled in clinical trials are excluded

Denominator Exclusions: None

Denominator Exceptions: None

Rationale:

(Adopted from 2017 Specifications Manual for National Hospital Quality Measure VTE-1)
Hospitalized patients at high-risk for VTE may develop an asymptomatic deep vein thrombosis (DVT), and die from pulmonary embolism (PE) even before the diagnosis is suspected. The majority of fatal events occur as sudden or abrupt death, underscoring the importance of prevention as the most critical action step for reducing death from PE (Geerts, 2008).

The estimated annual incidence of deep-vein thrombosis (DVT) and pulmonary embolism (PE), known collectively as venous thromboembolism (VTE), is approximately 900,000 (Geerts, 2008). Approximately two-thirds of cases of DVT or PE are associated with recent hospitalization. This is consistent with the 2001 report by The Agency for Healthcare Research and Quality (AHRQ). AHRQ indicates that “the appropriate application of effective preventive measures in hospitals has major potential for improving patient safety by reducing the incidence of venous thromboembolism” (Shojania, 2001).

Despite its proven effectiveness, rates of appropriate thromboprophylaxis remain low in both medical and surgical patients. A recent analysis from the ENDORSE survey, which evaluated prophylaxis rates in 17,084 major surgery patients, found that more than one third of patients at risk for VTE (38%) did not receive prophylaxis and that rates varied by surgery type (Cohen, et al., 2008).

In a review of evidence-based patient safety practices, the Agency for Healthcare Research and Quality defined thromboprophylaxis against VTE as the “number one patient safety practice” for hospitalized patients (Shojania, 2001). Updated “safe practices” published by the National Quality Forum (NQF) recommend routine evaluation of hospitalized patients for risk of VTE and use of appropriate prophylaxis (National Quality Forum. National Voluntary Consensus Standards for Prevention and Care of Venous Thromboembolism, 2006).

As noted by the ACCP, a vast number of randomized clinical trials provide irrefutable evidence that thromboprophylaxis reduces VTE events, and there are studies that have also shown that fatal PE is prevented by thromboprophylaxis (Geerts, et al. 2008).

Selected References: (Adopted from 2017 Specifications Manual for National Hospital Quality Measure VTE-1)

- Amin A, Spyropoulos AC, Dobesh P, et al. Are hospitals delivering appropriate VTE prevention? The venous thromboembolism study to assess the rate of thromboprophylaxis (VTE start). *J Thromb Thrombolysis*. 2010; 29:326-339.

- Caprini JA, Arcelus JI. State of the art venous thromboembolism prophylaxis. *SCOPE on Phlebology & Lymphology* 1:2005, 228-240.
- Cohen AT, Tapson VF, Bergmann JF, et al. Venous thromboembolism risk and prophylaxis in the acute hospital care setting (ENDORSE study): a multinational cross-sectional study. *Lancet*. 2008;371:387-394.
- Geerts WH, Bergqvist D, Pineo GF, Heit JA, Samama CM, Lassen MR, Colwell CW. Prevention of venous thromboembolism. The Eighth ACCP Conference on antithrombotic and thrombolytic therapy. *Chest*. 2008; 133:381S-453S.
- Gillies TE, Ruckley CV, Nixon SJ. Still missing the boat with fatal pulmonary embolism. *Br J Surg*. 1996 Oct;83(10):1394.
- Goldhaber SZ, Tapson VF; DVT FREE Steering Committee. A prospective registry of 5,451 patients with ultrasound confirmed deep vein thrombosis. *Am J Cardiol*. 2004; 93:259-262.
- Guyatt, G.H., Akl, E.A., Crowther, M., Gutterman, D., Schunemann, H. Antithrombotic Therapy and Prevention of Thrombosis, 9th edition: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *CHEST* 2012; 141(2)(Sup):7S-47S.
- Heit JA, Cohen AT, Anderson FA Jr, et al., Estimated annual number of incident and recurrent, non-fatal and fatal venous thromboembolism (VTE) events in the US, *Blood (ASH Annual Meeting Abstracts)*, 2005;106:Abstract 910.
- Heit JA, Silverstein MD, Mohr DN, Petterson TM, et al. Risk factors for deep vein thrombosis and pulmonary embolism: a population-based case-control study. *Arch Intern Med* 2000; 160:809-15.
- Hyers TM. Management of venous thromboembolism. *Arch Intern Med*. 2003;163:759-768.
- Kakkar AK, Cohen AT, Tapson VF, et al; ENDORSE Investigators. Venous thromboembolism risk and prophylaxis in the acute care hospital setting (ENDORSE survey): findings in surgical patients. *Ann Surg*. 2010;251:330-338.
- Kirwan CC, Nath E, Byrne GJ, McCollum CN. Prophylaxis for venous thromboembolism during treatment for cancer: questionnaire survey. *BMJ* 2003;327:597-8.
- Kucher N, Koo S, Quiroz R, Cooper JM, et al. Electronic alerts to prevent venous thromboembolism among hospitalized patients. *New England Journal of Medicine*. 2005, 352(10), 969-1036.
- Michota FA. Venous thromboembolism prophylaxis in medical patients. *Curr Opin Cardiol*. 2004 Nov;19(6):570-4.
- National Quality Forum. National Voluntary Consensus Standards for Prevention and Care of Venous Thromboembolism: Policy, Preferred Practices, and Initial Performance Measures. A Consensus Report. Washington, DC. *NQF*; 2006.
- Schleyer AM, Schreuder AB, Jarman KM, et al. Adherence to guideline-directed venous thromboembolism prophylaxis among medical and surgical inpatients at 33 academic medical centers in the United States. *Am J Med Qual*. 2011; 26:174-80.
- Shojania KG, Duncan BW, McDonald DM, et al. (Eds.). (2001). Making healthcare safer; A critical analysis of patient safety practices (Evidence Report/Technology Assessment No. 43). Prepared by the University of California at San Francisco-Stanford Evidenced-based Practice Center under Contract no. 290-97-0013 (AHRQ Publication NO.01-E058). Rockville, MD:Agency for Healthcare Research and Quality.
- Tapson VF, Hyers TM, Waldo AL, et al. Antithrombotic therapy practices in US hospitals in an era of practice guidelines. *Arch Intern Med*. 2005;165:1458-1464.

- Tooher R, Middleton P, Pham C, Fitrige R, et al. A systematic review of strategies to improve prophylaxis for venous thromboembolism in hospitals. *Ann Surg* 2005; 241:397-415.
- Wittkowsky AK. Effective anticoagulation therapy: defining the gap between clinical studies and clinical practice. *Am J Manag Care*. 2004;10:S297-S30

H-CPR (Hospitalist – Clinical Performance Registry) Measure #42 (ECPR42)

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

Number of Performance Rates: 1

Measures Scoring: Proportion

Risk Adjustment: No

Numerator: Patients Who Were Not Ordered 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: 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

Denominator:

- Any patient aged 18 and older evaluated by the Eligible Professional (CPT 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, 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, 00566, 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, 00940, 00942, 00944, 00948, 00952, 01112, 01120, 01130, 01140, 01150, 01160, 01170, 01173, 01180, 01190, 01200, 01202, 01210, 01212, 01214, 01215, 01220, 01230, 01232, 01250, 01260, 01270, 01272, 01274, 01320, 01340, 01360, 01380, 01382, 01390, 01392, 01400, 01402, 01404, 01420, 01440, 01442, 01444, 01462, 01464, 01470, 01472, 01474, 01480, 01482, 01484, 01486, 01490, 01500,

01502, 01520, 01522, 01610, 01620, 01622, 01630, 01634, 01636, 01638, 01650, 01652, 01654, 01656, 01670, 01680, 01682, 01710, 01712, 01714, 01716, 01730, 01732, 01740, 01742, 01744, 01756, 01758, 01760, 01770, 01772, 01782, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01860, 01916, 01920, 01922, 01924, 01925, 01926, 01930, 01931, 01935, 01936, 01951, 01952, 01958, 01961, 01963, 01965, 01966, 01991, 01992 99217-99220, 99221-99223, 99224-99226, 99231-99233, 99238-99239, 99234-99236, 99281-99285, 99291-99292) PLUS

- Diagnosis of Anemia PLUS
 - **ICD-10:** D50.0, D50.1, D50.8, D50.9, D51.0, D51.1, 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, D55.9, 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>8g/dL documented in the medical record PLUS
- Disposition of Admitted or Discharged (does not include transferred, eloped or AMA patients)
- Trauma patients excluded

Denominator Exclusions: None

Denominator Exceptions: None

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:

- Carson JL, Guyatt G, Heddle NM, et al. Clinical Practice Guidelines From the AABB: Red Blood Cell Transfusion Thresholds and Storage. *JAMA* 2016; 316:2025.
- Carson JL, Stanworth SJ, Roubinian N, et al. Transfusion thresholds and other strategies for guiding allogenic red blood cell transfusion. *Cochrane Database Syst Rev* 2016; 10:CD002042.
- Carson JL, Grossman BJ, Kleinman S, et al. Red blood cell transfusion: a clinical practice guideline from the AABB. *Ann Intern Med* 2012; 157; 49.
- Long B, Koyfman A. Red Blood Cell Transfusion in the Emergency Department. *J. Emerg Med.* 2016(51);120-130.
- Napolitano LM, Kurek S, Luchette FA, et al. Clinical practice guideline: red blood cell transfusion in adult trauma and critical care. *J Trauma.* 2009 Dec; 67(6): 1439-42.
- Practice Guidelines for blood component therapy: A report by the American Society of Anesthesiologists Task Force on Blood Component Therapy. *Anesthesiology* 1996; 84:732.
- Qaseem A, Humphrey LL, Fitterman N, et al. Treatment of anemia in patients with heart disease: a clinical practice guideline from the American College of Physicians. *Ann Intern Me* 2013; 153:770.
- Roubinian NH, Escobar GJ, Liu V, et al. Decreased red blood cell use and mortality in hospitalized patients. *JAMA Intern Med* 2014; 174: 1405.
- Roubinian NH, Escobar GJ, Liu V, et al. Trends in red blood cell transfusion and 30-day mortality among hospitalized patients. *Transfusion* 2014; 54: 2678.
- Salpeter SR, Buckley JS, Chatterjee S. Impact of more restrictive blood transfusion strategies on clinical outcomes: a meta-analysis and systemic review. *Am J Med* 2014; 127: 124.

H-CPR (Hospitalist – Clinical Performance Registry) Measure #16

Referenced Society of Post-Acute and Long-Term Care Medicine's Policy D-14: Promotion of Physician's Orders for Life-Sustaining Treatment Paradigm and the Institute of Medicine of the National Academies: Key Recommendations on Addressing End of Life

Measure Title: Physician's Orders for Life-Sustaining Treatment (POLST) Form

Inverse Measure: No

Measure Description: Percentage of Patients Aged 65 Years and Older with Physician's Orders for Life-Sustaining Treatment (POLST) Forms Completed

National Quality Strategy Domain: Communication and Care Coordination

Type of Measure: Process

Number of Performance Rates: 1

Measure Scoring: Proportion

Risk Adjustment: No

Numerator: Patients with a completed Physician's Orders for Life-Sustaining Treatment (POLST) form

Definitions:

- Physician's Orders for Life-Sustaining Treatment (POLST) form is defined as a legally recognized, transportable and actionable medical order – intended for seriously ill patients at high risk for mortality – that remains with the patient whether at home, in the hospital, or in a care facility; the form indicates patient-specified medical treatment preferences and is signed by the authorizing physician, physician assistant (PA), or nurse practitioner (NP)
- The following elements must be present and completed in the Physician's Orders for Life-Sustaining Treatment (POLST) form:
 - Legally recognized decision maker verification
 - Cardiopulmonary Resuscitation (CPR) preferences (e.g., attempt CPR, DNR)
 - Medical Intervention (e.g., full code, comfort measures, limited/selective treatments)
 - Signed by eligible healthcare provider (e.g., physician, PA, or NP)
- NOTE: The approved version and title of the Physician's Orders for Life-Sustaining Treatment (POLST) form may differ slightly from state to state; variations in forms are acceptable as long as the elements listed above are present

Numerator Options

- Performance Met:
 - Existing Physician's Orders for Life-Sustaining Treatment (POLST) form was acknowledged and documented in the medical record OR
 - Physician's Orders for Life-Sustaining Treatment (POLST) form was completed or updated and documented in the medical record OR
 - Documented reason for not acknowledging, completing or updating

Physician's Orders for Life-Sustaining Treatment (POLST) form (e.g., patient refuses, patient is unresponsive or does not have capacity to complete, legally recognized decision maker is not present)

- Performance Not Met: Physician's Orders for Life-Sustaining Treatment (POLST) form was not acknowledged, completed or updated, reason not specified

Denominator:

- Adult patients aged ≥ 65 years evaluated by the Eligible Professional in the Post-acute Facility (E/M Codes 99304-99310, 99315, 99316)

Denominator Exclusions: None

Denominator Exceptions: None

Rationale:

For patients and their family caregivers, control over treatment decisions is a high priority with an illness diagnosed as serious and life-limiting. (Singer et al, 1999) The Physician Orders for Life-Sustaining Treatments (POLST) form is designed to supplement and build upon advanced care planning and advanced directives. Unlike advanced directives, which are often generalized and require intermediaries on the patient's behalf (Bomba et al, 2012), the POLST form allows patients to clearly communicate their wishes regarding medical treatment and ensure that those wishes are honored across the care continuum by codifying their advanced directives as portable medical orders. Clinicians are able to focus on treatments desired by patients and avoid treatments that are unwanted by patients. These legally recognized, HIPAA-compliant forms follow the patients wherever they go (e.g., home, skilled nursing facility, acute care facility), and are intended to be completed for patients who are seriously ill and unlikely to recover (Moss et al., 2008). The POLST form includes key preferences (e.g., DNR status) that can be missed during patient transfers between facilities. The use of the POLST form prevents unwanted hospitalizations, readmissions and invasive medical procedures for patients who are near death. (Lee et al, 2000) AMDA – The Society of Post-Acute and Long-Term Care Medicine and the Institute of Medicine (IOM) of the National Academies support and promote the Physician's Orders for Life-Sustaining Treatment Paradigm.

References:

- AMDA – The Society for Post-Acute and Long-Term Care Medicine. Policy D-14: PHYSICIAN ORDERS FOR LIFE-SUSTAINING TREATMENT (POLST). <http://www.paltc.org/amda-white-papers-and-resolution-position-statements/physician-orders-life-sustaining-treatment>. Accessed December 22 2016.
- Basanta WE. (2002). Advance Directives and Life-Sustaining Treatment: A Legal Primer. Hematology/Oncology Clinics of North America;16(6):1381-96.
- Bomba PA, Kemp M, Black JS. (2012). POLST: An improvement over traditional advance directives. Cleveland Clinic Journal of Medicine;79(7):457-64.
- Dunne PM, Tolle SW, Moss AH, Black JS. (2007). The POLST Paradigm: Respecting the Wishes of Patients and Families. Annals of Long-Term Care;15(9):33-40.
- Fromme EK, Zive D, Schmidt TA, Cook JNB, Tolle SW. Association Between Physician Orders for Life-Sustaining Treatment for Scope of Treatment and In-Hospital Death in Oregon. Journal of the American Geriatrics Society;62(7)1246-51.
- Hammes B, Rooney BL, Gundrum JD, Hickman SE, Hager N. (2012) The POLST

Program: A Retrospective Review of the Demographics of Use and Outcomes in One Community Where Advance Directives Are Prevalent. *Journal of Palliative Medicine*;15(1):77-85.

- Hartle GA, Thimons G, Angelelli J. (2014). *Nursing Research and Practice*, vol. 2014, Article ID 761784, 7 pages. doi:10.1155/2014/761784
- Hickman SE, Nelson CA, Moss AH, Hammes BJ, Terwilliger A, Jackson A, Tolle SW. (2009) Use of the Physician Orders for Life-Sustaining Treatment (POLST) Paradigm Program in the Hospice Setting. *Journal of Palliative Medicine*;12(2):133–41.
- Hickman SE, Nelson CA, Moss AH, Tolle SW, Perrin NA, Hammes BJ. (2011) The Consistency Between Treatments Provided to Nursing Facility Residents and Orders on the Physician Orders for Life- Sustaining Treatment (POLST) Form. *Journal of the American Geriatrics Society*;59(11):2091-99.
- Institute of Medicine (IOM) of the National Academies – Committee on Approaching Death: Addressing Key End of Life Issues. (2014) Key findings and recommendations. *Dying in America: Improving quality and honoring individual preferences near the end of life*. The National Academies Press.
<http://www.nationalacademies.org/hmd/~media/Files/Report%20Files/2014/EOL/Key%20Findings%20and%20Recommendations.pdf> Accessed: January 6 2017.
- Kim H, Ersek M, Bradway C, Hickman SE. (2015) Physician Orders for Life-Sustaining Treatment for Nursing Home Residents with Dementia. *Journal of the American Association of Nurse Practitioners*;27(11):606-14.
- Lee MA, Brummel-Smith K, Meyer, J, et al. (2000). Physician Orders for Life-Sustaining Treatment (POLST): Outcomes in a PACE Program. *Journal of the American Geriatrics Society*;48(10):1219-25.
- Moss AH, Ganjoo, J, Sharma S, Gansor J, Senft S, Weaner B, Dalton C, MacKay K, Pellegrino B, Anantharaman P, Schmidt R. (2008). Utility of the “Surprise” Question to Identify Dialysis Patients with High Mortality. *Clinical Journal of the American Society of Nephrology*;3(5):1379–84.
- Nisco M, Mittelberger J, Citko J. POLST: An Evidence-Based Tool for Advance Care Planning. <http://www.nphco.org>. Accessed: November 27 2016.
- Singer PA, Martin DK, Kelner M. (1999). Quality End of Life Care: Patients’ Perspective. *Journal of the American Medical Association*. 281: 163-68.
- Tolle SW, Tilden VP, Nelson CA, Dunn PM. (1998). A Prospective Study of the Efficacy of the Physician Order Form for Life-sustaining Treatment. *Journal of the American Geriatrics Society*;46(9):1097-102.
- Vandenbroucke A, Nelson S, Bomba P, Moss AH. (2013) POLST: Advance Care Planning for the Seriously Ill. <http://www.polst.org/>. Accessed: November 27 2016.

H-CPR (Hospitalist – Clinical Performance Registry) Measure #17

Referenced National Pressure Ulcer Advisory Panel's 2014 Prevention and Treatment of Pressure Ulcers: Clinical Practice Guidelines

Measure Title: Pressure Ulcers – Risk Assessment and Plan of Care

Inverse Measure: No

Measure Description: Percentage of Adult Post-acute Facility Patients That Had a Risk Assessment for Pressure Ulcers and a Plan of Care for Pressure Ulcer Prevention/Treatment Completed

National Quality Strategy Domain: Patient Safety

Type of Measure: Process

Number of Performance Rates: 1

Measure Scoring: Proportion

Risk Adjustment: No

Numerator: Adult Post-acute Facility Patients that Had a Risk Assessment for Pressure Ulcers and a Plan of Care for Pressure Ulcer Prevention OR Treatment Documented

Definitions

- Pressure ulcer: Localized damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear.
- Risk assessment:
 - Nationally recognized scale (e.g., Braden Scale or Braden Q Scale)
 - Nutrition
 - Activity and Mobility Limitations
 - History of skin breakdown
 - Cognition
- Plan of care – Prevention:
 - Scheduled skin integrity assessments
 - Minimize friction and shear
 - Minimize pressure with off-loading
 - Manage moisture
 - Maintain adequate nutrition and hydration
- Plan of care – Treatment:
 - Scheduled wound description/staging
 - Etiology of pressure (e.g., dementia, diapering)
 - Body repositioning
 - Nutritional status
 - Bacterial colonization/infection
 - Wound management (e.g., wound dressings, barrier creams, medicated creams, antibiotics, gauze)

Numerator Options

- Performance Met: Patients who did have pressure ulcer risk assessment AND a plan of care for pressure ulcer prevention or treatment documented
- Performance Not Met: Patients who did not have pressure ulcer risk assessment AND a plan of care for pressure ulcer prevention or treatment documented

Denominator:

- Adult patients aged ≥ 18 years evaluated by the Eligible Professional in the Post-acute Facility (E/M Codes 99304-99310, 99315, 99316)

Denominator Exclusions: None

Denominator Exceptions: None

Rationale:

Pressure ulcers have been associated with an extended length of hospitalization, sepsis and mortality. About 60,000 United States patients are estimated to die yearly from hospital-acquired pressure ulcers and their complications. (Sullivan, 2013) Pressure ulcers cause deep muscle and tissue damage that can require lengthy recovery times, depending on various risk factors, including age, blood pressure, body temperature, and protein intake. Pressure ulcers are also associated with fatal septic infections. (Redelings et al., 2005; Brem et al., 2010; Lyder, 2003) In addition, the risk of pressure ulcer development increases among older patients and among patients with cardiovascular and endocrine diseases. The total cost for treatment of pressure ulcers in the United States is estimated at \$11 billion per year (Ackroyd-Stolarz, 2011), with an approximate financial impact of \$18.8 million of Medicare program payments annually (Kandilov et al., 2014). In post-acute care facilities, pressure ulcers can cost Medicare as much as \$15,000 in treatments (Kandilov et al., 2014) and can range between \$500 to \$40,000 per pressure ulcer treated (Lyder, 2003).

The care provided by clinicians, which includes implementation of an effective risk assessment and a plan of care for prevention of pressure ulcers or active treatment for patients with developing pressure ulcers, is critical to improving patient outcomes (Siem et al, 2003) and saving costs through comprehensive prevention efforts (Tippett, 2009). The National Pressure Ulcer Advisory Panel's recommendations state that clinicians are responsible for the following: reviewing risk factors and identifying potential causes for development of pressure ulcers; implementing focused interventions to reduce, stabilize, and remove risk factors; and implementing targeted pressure injury management protocols as needed (NPUAP Quality of Care Regulations).

References:

- Ackroyd-Stolarz S,. Improving the prevention of pressure ulcers as a way to reduce health care expenditures. CMAG. 2014 Jul;186(10):E370-E371.
- Brem H, Maggi J, Nierman D, Rolnitzky L, Bell D, Rennert R, Golinko M, Yan A, Lyder C, Vladeck B. High cost of stage IV pressure ulcers. Am J Surg. 2010 Oct;200(4):473-77.
- Chen HL, Shen WQ, Liu P. A meta-analysis to evaluate the predictive validity of the Braden scale for pressure ulcer risk assessment in long-term care. Ostomy Wound Manage. 2016 Sep;62(9):20-8.

- Cuddigan J, Berlowitz DR, Ayello EA. Pressure ulcers in America: prevalence, incidence, and implications for the future. An executive summary of the National Pressure Ulcer Advisory Panel monograph. *Adv Skin Wound Care*. 2001 Jul-Aug;14(4):208-15.
- Institute for Clinical Systems Improvement (ICSI). Pressure ulcer prevention and treatment protocol. Health care protocol. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Jan. 88 p. [112 references]
- Kandilov, AMG, Coomer NM, Dalton, K. The impact of hospital-acquired conditions on medicare program payments. *Medicare Medicaid Res Rev*. 2014 Oct;4(4):mmrr2014-004-04-a01.
- Lyder, CH. Pressure ulcer prevention and management. *JAMA*. 2003 Jan 8;289(2):223-6
- Minnesota Department of Health. Adverse health events in Minnesota: seventh annual public report. 2011 Jan.
- National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and treatment of pressure ulcers: quick reference guide.
- National Pressure Ulcer Advisory Panel. The NPUAP selected "Quality of Care Regulations" made easy. Accessed December 22 2016. <http://www.npuap.org/wp-content/uploads/2014/03/NPUAP-F-tag-final-March-2014.pdf>
- Niederhauser A, VanDeusen Lukas C, Parker V, Ayello EA, Zulkowski K, Berlowitz D. Comprehensive programs for preventing pressure ulcers: a review of the literature. *Adv Skin Wound Care*. 2012 Jul.;25(4):167-88.
- Park-Lee, E, Caffrey, C. Pressure ulcers among nursing home residents: United States, 2004. NCHS Data Brief. 2009 Feb.
- Redelings, MD, Lee, NE, Sorvillo, F. Pressure ulcers: more lethal than we thought? *Adv Skin Wound Care*. 2005 Sep; 18(7):367-72.
- Siem CA, Wipke-Tevis DD, Rantz MJ, Popejoy LL. Skin assessment and pressure ulcer care in hospital-based skilled nursing facilities. *Ostomy Wound Manage*. 2003 Jun; 49(6):42-4.
- Stechmiller JK, Cowan L, Whitney JD, Phillips L, Aslam R, Barbul A, Gottrup F, Gould L, Robson MC, Rodeheaver G, Thomas D, Stotts N. Guidelines for the prevention of pressure ulcers. *Wound Repair Regen*. 2008 Mar-Apr;16(2):151-68.
Sullivan N. Preventing In-Facility Pressure Ulcers. In: *Making Health Care Safer II: An Updated Critical Analysis of the Evidence for Patient Safety Practices*. Rockville (MD): Agency for Healthcare Research and Quality (US); 2013 Mar. (Evidence Reports/Technology Assessments, No. 211.) Chapter 21. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK133388/>
- Tippet, AW. Reducing the incidence of pressure ulcers in nursing home residents: A prospective 6-year evaluation. *Ostomy Wound Manage*. 2009 Nov; 55(11):52-8.
- White-Chu EE, Reddy M. Wound care in short-term rehabilitation facilities and long-term care: special needs for a special population. *Skinmed*. 2012 Mar-Apr; 10(2):75-81.
- Wound, Ostomy, and Continence Nurses Society. Prevalence and incidence: a toolkit for clinicians. Glenview (IL): WOCN; 2004.

H-CPR (Hospitalist – Clinical Performance Registry) Measure #18

Referenced NQF 0689: Percent of Residents Who Lose Too Much Weight

Measure Title: Unintentional Weight Loss – Risk Assessment and Plan of Care

Inverse Measure: No

Measure Description: Percentage of Adult Post-acute Facility Patients that Had a Risk Assessment for Unintentional Weight Loss and a Plan of Care for Unintentional Weight Loss Documented by Provider

National Quality Strategy Domain: Patient Safety

Type of Measure: Process

Number of Performance Rates: 1

Measure Scoring: Proportion

Risk Adjustment: No

Numerator: Adult Post-acute Facility Patients that Had a Risk Assessment for Unintentional Weight Loss, Reason for Weight Loss (If Applicable) and a Plan of Care for Unintentional Weight Loss Documented

Definitions

- Weight loss episode: A loss of weight equal to or greater than 5% within a 30-day period or 10% within a 180-day period
 - Starting with the patient's weight closest to 30 days ago, the patient's current weight is equal to or less than 95%. Starting with the patient's weight closest to 180 days ago, the patient's current weight is equal to or less than 90%
- Risk Assessment:
 - Nationally recognized tool [e.g., Minimum Data Set (MDS) Swallowing/Nutritional Status, Mini Nutritional Assessment (MNA), Malnutrition Screening Tool (MST)]
 - Weight
 - Height
 - Body Mass Index (BMI)
- Plan Of Care:
 - Oral nutrition support (e.g., therapeutic diet, mechanically altered diet, condition specific diet, fortified foods, and/or supplements)
 - Parenteral feeding
 - Enteral feeding tube
 - Patient-centered and/or condition-specific considerations (e.g., prescription of orexigenic alternatives to anorectic drugs, hydration and edema status, increased nutritional needs for patients at high risk of pressure ulcers, patient preferences and availability of choices for foods and fluids, feeding assistance by staff to enhance the resident's self-feeding ability, social stimulation throughout meal or snack period)

Numerator Options

- Performance Met: Patients who did have a risk assessment for unintentional weight loss, reason for weight loss (if applicable) AND a plan of care for unintentional weight loss documented
- Performance Not Met: Patients who did not have a risk assessment for unintentional weight loss, reason for weight loss (if applicable) AND a plan of care for unintentional weight loss documented

Denominator:

- Adult patients aged ≥ 18 years evaluated by the Eligible Professional in the Post-acute Facility (E/M Codes 99304-99310, 99315, 99316)

Denominator Exclusions: None

Denominator Exceptions: None

Rationale: Unintended and excessive weight loss is a significant problem among nursing home residents. Weight loss of 5% or more in one month or 10% or more over six months is usually considered unhealthy (Thomas et al., 2000), and prior studies have found an association between weight loss and increased mortality (Sullivan et al., 2002; Stack et al., 2013; Keller et al., 2015).

Nutritional issues have been identified as a priority area for practice change and research in long-term care (Keller et al., 2015; Morley et al., 2014; Rolland et al., 2011). In long-term care, the primary cause of malnutrition is poor food and fluid intake (Keller et al., 2014, Bell et al., 2013). Nursing home residents often have chronic diseases and functional impairments that may impair proper nutrition and hydration (Morley, 2007; Sloane et al., 2008; Bourdel-Marchasson, 2010) and require medical interventions (Morley, 2007). Various chronic illnesses are associated with malnutrition, including cancer, diabetes, depression, and chronic obstructive pulmonary disease (COPD) (Huffman, 2002). Medications, oral health problems (such as missing teeth), dysphagia, and dementia can complicate nutrition and hydration. Medications may cause nausea, anxiety, constipation, and lack of appetite. Depression has been identified as the "most common reversible illness" associated with malnutrition (Sloane et al., 2008). Dehydration is a major factor in weight loss in about 10% of nursing home residents (Kaldy et al., 2000; Feinsod et al., 2004; Smith, 2006). A review study demonstrated that weight loss is the most objective and reproducible marker of nutritious status for nursing home residents (Bell et al., 2013).

Elderly individuals with excessive and rapid weight loss are at higher risk for readmissions, extended stays, (Stratton 2006) functional decline, hip fracture (Langlois et al., 2001; Ensrud et al., 2003) and mortality (Covinsky et al., 1999; Kiely & Flacker, 2000; Sullivan et al., 2002; Wedick et al., 2002; Keller & Ostbye, 2005; Amador et al., 2006; Stack et al., 2013). Detecting and preventing weight loss is central to ensure appropriate nutritional intake.

Care processes have been found to influence the nutritional intake and risk of weight loss for the elderly (Simmons et al., 2001; Altus, Engelman, & Matthews, 2002; Pelletier, 2004; Milne et al., 2009; Simmons et al., 2003). Nutrition and dining programs may potentially reduce the risk of weight loss for nursing home residents. For example, a Cochrane meta-analysis found that supplementation produces small but consistent weight gain in older people (Milne et al., 2009).

Appropriate management of clinical conditions for people at higher risk for weight loss (e.g., those with depression) is also a potentially effective way to prevent unintended weight loss (Malone, 2005; Rigler et al., 2001).

Several national guidelines from organizations such as the American Dietetic Association, the Gerontological Society of America, the Council for Nutritional Strategies in Long-Term Care (Thomas 2000), the American Medical Directors Association, the National Institute for Health Care and Excellence (NICE 2006), the American Academy of Nutrition and Dietetics (White 2012), and the American Society of Parenteral and Enteral Nutrition (ASPEN) (Mueller 2011, White 2012), recommend nutritional risk assessments for unintentional weight loss and documented plans of care for inpatients, outpatients, skilled nursing and long-term care patients.

Several national risk assessment instruments have also been validated and endorsed by national organizations. The [Minimum Data Set \(MDS 3.0\) Nursing Home Comprehensive Item Set Chapter K: Swallowing/Nutrition Status](#) is required by the Centers for Medicare and Medicaid Services (CMS) for all skilled nursing facility prospective payment system patients to assess both swallowing and nutritional status as well as a care plan. [The Mini Nutritional Assessment \(MNA\)](#), both the full assessment and the short form (SF) classifies older people as well-nourished, at risk for malnutrition or malnourished. The [Alliance to Advance Patient Nutrition](#) has developed the [Malnutrition Screening Tool \(MST\)](#) and an entire toolkit of resources for physicians, nurses and patients to improve patient's nutritional status. Both risk assessment and care planning involves establishing a course of action with input from the clinician, nursing, dietitians, and the resident (as well as resident's family and/or guardian or other legally authorized representative) to improve their nutritional status.

References:

- Alliance to Advance Patient Nutrition. Malnutrition Screening Tool (MST). 2014. Accessed on December 2, 2016. Accessed at http://static.abbottnutrition.com/cms-prod/malnutrition.com/img/Alliance_Malnutrition_Screening_Tool_2014_v1.pdf.
- Altus DE, Engelman KK, Mathews RM. Using family-style meals to increase participation and communication in persons with dementia. *J Gerontol Nurs*. 2002 Sep;28(9):47-53.
- Amador LF, Al Snih S, Markides KS, Goodwin JS. Weight change and mortality among older Mexican Americans. *Aging Clin Exp Res*. 2006 Jun;18(3):196-204.
- Bell CL, Tamura BK, Masaki KH, Amella EJ. Prevalence and measures of nutritional compromise among nursing home patients: weight loss, low body mass index, malnutrition, and feeding dependency, a systematic review of the literature. *J Am Med Dir Assoc*. 2013 Feb;14(2):94-100.
- Bourdel-Marchasson I. How to improve nutritional support in geriatric institutions. *J Am Med Dir Assoc*. 2010 Jan;11(1):13-20. [74 references]
- Cereda E, Pedrolli C. The geriatric nutritional risk index. *Current Opinion in Clinical Nutrition and Metabolic Care* 2009, 12:1–7
- Cereda E. Mini nutritional assessment. *Curr Opin Clin Nutr Metab Care* 2012, 15:29–41.
- Covinsky KE, Martin GE, Beyth RJ, Justice AC, Sehgal AR, Landefeld CS. The relationship between clinical assessments of nutritional status and adverse outcomes in older hospitalized medical patients. *J Am Geriatr Soc*. 1999 May;47(5):532-8.

- Ensrud KE, Ewing SK, Stone KL, Cauley JA, Bowman PJ, Cummings SR. Intentional and unintentional weight loss increase bone loss and hip fracture risk in older women. *J Am Geriatr Soc.* 2003 Dec;51(12):1740-7.
- Feinsod FM, Levenson SA, Rapp K, Rapp MP, Beechinor E, Liebmann L. Dehydration in frail, older residents in long-term care facilities. *J Am Med Dir Assoc.* 2004 Mar-Apr;5(2 Suppl):S35-41. [38 references]
- Huffman GB. Evaluating and treating unintentional weight loss in the elderly. *Am Fam Physician.* 2002 Feb 15;65(4):640-50. [43 references]
- Keller H, Beck AM, Namasivayam A, International-Dining in Nursing home Experts (I-DINE) Consortium. Improving food and fluid intake for older adults living in long-term care: a research agenda. *J Am Med Dir Assoc.* 2015 Feb;16(2):93-100.
- Keller HH, Ostbye T. Body Mass Index (BMI), BMI change and mortality in community-dwelling seniors without dementia. *J Nutr Health Aging.* 2005 Sep-Oct;9(5):316-20.
- Kiely DK, Flacker JM. Resident characteristics associated with mortality in long-term care nursing homes: is there a gender difference. *J Am Med Dir Assoc.* 2000 Jan-Feb;1(1):8-13.
- Langlois JA, Mussolino ME, Visser M, Looker AC, Harris T, Madans J. Weight loss from maximum body weight among middle-aged and older white women and the risk of hip fracture: the NHANES I epidemiologic follow-up study. *Osteoporos Int.* 2001;12(9):763-8.
- Malone M. Medications associated with weight gain. *Ann Pharmacother.* 2005 Dec;39(12):2046-55.
- Milne AC, Potter J, Vivanti A, Avenell A. Protein and energy supplementation in elderly people at risk from malnutrition. *Cochrane Database Syst Rev.* 2009 Apr 15;(2):CD003288.
- Morley JE, Caplan G, Cesari M, Dong B, Flaherty JH, Grossberg GT, Holmerova I, Katz PR, Koopmans R, Little MO, Martin F, Orrell M, Ouslander J, Rantz M, Resnick B, Rolland Y, Tolson D, Woo J, Vellas B. International survey of nursing home research priorities. *J Am Med Dir Assoc.* 2014 May;15(5):309-12.
- Morley JE. Weight loss in the nursing home. *J Am Med Dir Assoc.* 2007 May;8(4):201-4.
- Mueller C, Compher C, Ellen DM, American Society for Parenteral and Enteral Nutrition (ASPEN) Board of Directors. [ASPEN clinical guidelines: Nutrition screening, assessment, and intervention in adults.](#) *J Parenter Enteral Nutr.* 2011 Jan;35(1):16-24.
- National Collaborating Centre for Acute Care, February 2006. Nutrition support in adults Oral nutrition support, enteral tube feeding and parenteral nutrition. <https://www.nice.org.uk/guidance/cg32/evidence/full-guideline-194889853>
- Omran ML, Morley JE. Assessment of protein energy malnutrition in older persons, part I: history, examination, body composition, and screening tools. *Nutrition* 2000; 16:50–63.
- Omran ML, Morley JE. Assessment of protein energy malnutrition in older persons, part II: laboratory evaluation. *Nutrition* 2000; 16:131–140.
- Pelletier CA. What do certified nurse assistants actually know about dysphagia and feeding nursing home residents? *Am J Speech Lang Pathol.* 2004 May;13(2):99-113.
- Rigler SK, Webb MJ, Redford L, Brown EF, Zhou J, Wallace D. Weight outcomes among antidepressant users in nursing facilities. *J Am Geriatr Soc.* 2001 Jan;49(1):49-55.
- Rolland Y, Aquino JP, Andrieu S, Beard J, Benetos A, Berrut G, Coll-Planas L, Dartigues JF, Dong B, Forette F, Franco A, Franzoni S, Hornez T, Metais P, Ruault G, Stephan E, Swagerty D, Tolson D, Volicer L, Vellas B, Morley J. Identification of the main domains for quality of care and clinical research in nursing homes. *J Nutr Health Aging.* 2011 May;15(5):410-24.
- Simmons SF, Alessi C, Schnelle JF. An intervention to increase fluid intake in nursing home residents: prompting and preference compliance. *J Am Geriatr Soc.* 2001 Jul;49(7):926-33.

- Simmons SF, Garcia ET, Cadogan MP, Al-Samarrai NR, Levy-Storms LF, Osterweil D, Schnelle JF. The minimum data set weight-loss quality indicator: does it reflect differences in care processes related to weight loss? *J Am Geriatr Soc.* 2003 Oct;51(10):1410-8.
- Simmons SF, Osterweil D, Schnelle JF. Improving food intake in nursing home residents with feeding assistance: a staffing analysis. *J Gerontol A Biol Sci Med Sci.* 2001 Dec;56(12):M790-4.
- Simmons SF, Keeler E, Zhuo X, Hickey KA, Sato H, Schnelle JF. Prevention of Unintentional Weight Loss in Nursing Home Residents: A Controlled Trial of Feeding Assistance. *Journal of the American Geriatrics Society.* 2008;56(8):1466-1473. Sloane PD, Ivey J, Helton M, Barrick AL, Cerna A. Nutritional issues in long-term care. *J Am Med Dir Assoc.* 2008 Sep;9(7):476-85. [68 references]
- Smith PA. Nutrition, hydration, and dysphagia in long-term care: Differing opinions on the effects of aspiration. *J Am Med Dir Assoc.* 2006 Nov;7(9):545-9.
- Stack S, Chertow GM, Johansen KL, Si Y, Tamura MK. Pre-ESRD changes in body weight and survival in nursing home residents starting dialysis. *Clin J Am Soc Nephrol.* 2013 Oct;8(10):1734-40.
- Stratton RJ, King CL, Stroud MA. Malnutrition Universal Screening Tool predicts mortality and length of stay in hospital elderly. *Br J Nutr* 2006; 95: 325-330.
- Sullivan DH, Morley JE, Johnson LE, Barber A, Olson JS, Stevens MR, Yamashita BD, Reinhart SP, Trotter JP, Olave XE. The GAIN (Geriatric Anorexia Nutrition) registry: the impact of appetite and weight on mortality in a long-term care population. *J Nutr Health Aging.* 2002;6(4):275-81.
- Thomas DR, Ashmen W, Morley JE, Evans WJ. Nutritional management in long-term care: development of a clinical guideline. Council for Nutritional Strategies in Long-Term Care. *J Gerontol A Biol Sci Med Sci.* 2000 Dec;55(12):M725-M734.
- Wedick NM, Barrett-Connor E, Knoke JD, Wingard DL. The relationship between weight loss and all-cause mortality in older men and women with and without diabetes mellitus: the Rancho Bernardo study. *J Am Geriatr Soc.* 2002 Nov;50(11):1810-5.
- White et al. Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics Recommended for the Identification and Documentation of Adult Malnutrition (Undernutrition). *Journal of Parenteral and Enteral Nutrition* 2012: Vol 36, Issue 3, pp. 275 – 283
<http://journals.sagepub.com/doi/pdf/10.1177/0148607112440285>