

## NATIONAL QUALITY FORUM—Evidence (subcriterion 1a)

**Measure Number** (if previously endorsed): Click here to enter NQF number

**Measure Title** Standardized Ratio for Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge for Dialysis Facilities (ED30)

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Click here to enter composite measure #/ title

**Date of Submission:** [9/29/2017](#)

### Instructions

- Complete 1a.1 and 1a.12 for all measures.
- Complete ***EITHER 1a.2, 1a.3 or 1a.4*** as applicable for the type of measure and evidence.
- For composite performance measures:
  - A separate evidence form is required for each component measure unless several components were studied together.
  - If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.
- All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed.
- If you are unable to check a box, please highlight or shade the box for your response.
- Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](#).

**Note:** The information provided in this form is intended to aid the Standing Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF's evaluation criteria.

### 1a. Evidence to Support the Measure Focus

The measure focus is evidence-based, demonstrated as follows:

- **Health outcome:** <sup>3</sup> a rationale supports the relationship of the health outcome to processes or structures of care. Applies to patient-reported outcomes (PRO), including health-related quality of life/functional status, symptom/symptom burden, experience with care, health-related behavior.
- **Intermediate clinical outcome:** a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence <sup>4</sup> that the measured intermediate clinical outcome leads to a desired health outcome.
- **Process:** <sup>5</sup> a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence <sup>4</sup> that the measured process leads to a desired health outcome.
- **Structure:** a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence <sup>4</sup> that the measured structure leads to a desired health outcome.
- **Efficiency:** <sup>6</sup> evidence not required for the resource use component.

### Notes

**3.** Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement.

**4.** The preferred systems for grading the evidence are the U.S. Preventive Services Task Force (USPSTF) [grading definitions](#) and [methods](#), or Grading of Recommendations, Assessment, Development and Evaluation ([GRADE](#)) [guidelines](#).

**5.** Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multistep process, the step with the strongest evidence for the link to the desired outcome should be selected as the focus of measurement. Note: A measure focused only on collecting PROM data is not a PRO-PM.

**6.** Measures of efficiency combine the concepts of resource use and quality (see NQF's [Measurement Framework: Evaluating Efficiency Across Episodes of Care](#); [AQA Principles of Efficiency Measures](#)).

**1a.1. This is a measure of:** (should be consistent with type of measure entered in De.1)

Outcome

- ☒ Health outcome: Emergency department utilization occurring within 30 days of hospital discharge that does not result in hospitalization
  - ☐ Patient-reported outcome (PRO): Click here to name the PRO  
*PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors. (A PRO-based performance measure is not a survey instrument. Data may be collected using a survey instrument to construct a PRO measure.)*
- ☐ Intermediate clinical outcome (e.g., lab value): Click here to name the intermediate outcome
- ☐ Process: Click here to name what is being measured
  - ☐ Appropriate use measure: Click here to name what is being measured
- ☐ Structure: Click here to name the structure
- ☐ Composite: Click here to name what is being measured

**1a.12 LOGIC MODEL** Diagram or briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient's health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

Emergency Department (ED) utilization is an important indicator of patient morbidity and quality of life. Nearly half (46.2%) of ED visits by patients with ESRD result in a hospital admission [1]. The need for acute care after hospital discharge in this population is quite high with 27% of patients being seen in an ED [2] and 36.6% of patients experiencing re-hospitalization [3] in the 30 days after a hospital discharge. This readmission rate is twice that of older Medicare beneficiaries without a diagnosis of kidney disease. The overall aim is to reduce dialysis patients' need for unscheduled acute care in the ED following hospitalization. Post-discharge care by dialysis facilities—and coordination of that care with other providers—has the potential to prevent excessive ED utilization during this time period.

There are numerous dialysis care processes that can influence the likelihood of a patient requiring care in the ED. These processes include:

- (1) Inadequate processes related to fluid management/removal. Inadequate control of total body fluid balance and fluid removal can result in fluid overload and congestive heart failure, increasing the possibility of the need for ED use and emergent dialysis.
- (2) Inadequate infection prevention. Inadequate infection prevention processes, including suboptimal management of vascular access, can lead to bacteremia or septicemia, increasing the possibility of the need for ED use.
- (3) Inadequate management of electrolyte abnormalities. Failure to maintain processes to ensure adequate dialysis and nutritional counseling can lead to hyperkalemia, increasing the possibility of the need for ED use.

**\*\*RESPOND TO ONLY ONE SECTION BELOW -EITHER 1a.2, 1a.3 or 1a.4) \*\***

**1a.2 FOR OUTCOME MEASURES including PATIENT REPORTED OUTCOMES-** State the rationale supporting the relationship between the health outcome (or PRO) to at least one healthcare structure, process (e.g., intervention, or service).

Among Medicare beneficiaries, 30% of hospital admissions that originate in the ED are for diagnoses that are often dialysis related such as complications of vascular access, congestive heart failure/fluid overload, septicemia, and hyperkalemia [1]. Recent research points to many additional opportunities to further reduce unnecessary ED use in this population.

While interventions to decrease the frequency of ED use in the post-hospitalization period have not been tested specifically in the dialysis patient population [3], there are effective interventions reported in this population to reduce hospital re-admission. Acknowledging the strong association between ED encounters and subsequent hospitalization, these dialysis facility interventions would likely be effective in preventing outpatient ED encounters as well.

Given the association between missed dialysis treatments and increased risk of an ED visit [4], dialysis facility interventions that improve adherence to the treatment schedule would be expected to decrease ED utilization, particularly in the post-acute care period. Other interventions, such as telehealth, have been demonstrated to reduce ED utilization in high-risk dialysis patients [5]. In the general population, outpatient ED visits were reported to have increased more slowly for Medicare patients being treated by patient-centered medical home practices when compared to non-patient-centered medical homes[6]. While similar data are lacking in the ESRD patient population, the current Comprehensive ESRD Care (ESRD Seamless Care Organization, ESCO) model may provide similar infrastructure to reduce ED utilization. Finally, other critical activities in the post-hospitalization period focus on medication reconciliation as well as appraisal of the target weight and volume management. This is particularly important since heart failure has been implicated as one of the most frequent reasons for an ED visit within 30 days of hospital discharge [7].

**1a.3. SYSTEMATIC REVIEW(SR) OF THE EVIDENCE (for INTERMEDIATE OUTCOME, PROCESS, OR STRUCTURE PERFORMANCE MEASURES)** If the evidence is not based on a systematic review go to section 1a.4) If you wish to include more than one systematic review, add additional tables.

What is the source of the systematic review of the body of evidence that supports the performance measure? A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data. (IOM)

- ☐ Clinical Practice Guideline recommendation (with evidence review)
- ☐ US Preventive Services Task Force Recommendation
- ☐ Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*)
- ☐ Other

<b>Source of Systematic Review:</b> <ul style="list-style-type: none"> <li>• Title</li> <li>• Author</li> </ul>	
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<ul style="list-style-type: none"> <li>• <b>Date</b></li> <li>• <b>Citation, including page number</b></li> <li>• <b>URL</b></li> </ul>	
Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR.	
Grade assigned to the <b>evidence</b> associated with the recommendation with the definition of the grade	
Provide all other grades and definitions from the evidence grading system	
Grade assigned to the <b>recommendation</b> with definition of the grade	
Provide all other grades and definitions from the recommendation grading system	
Body of evidence: <ul style="list-style-type: none"> <li>• Quantity – how many studies?</li> <li>• Quality – what type of studies?</li> </ul>	
Estimates of benefit and consistency across studies	
What harms were identified?	
Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR?	

#### 1a.4 OTHER SOURCE OF EVIDENCE

*If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.*

**1a.4.1 Briefly SYNTHESIZE the evidence that supports the measure.** A list of references without a summary is not acceptable.

**1a.4.2 What process was used to identify the evidence?**

**1a.4.3. Provide the citation(s) for the evidence.**

1. Lovasik, B.P., et al., Emergency Department Use and Hospital Admissions Among Patients With End-Stage Renal Disease in the United States. *JAMA Intern Med*, 2016. 176(10): p. 1563-1565.

2. United States Renal Data System. 2016 USRDS annual data report: Epidemiology of kidney disease in the United States. Volume 2, Chapter 5. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2016.
3. Mathew, A. T.; Strippoli, G. F.; Ruospo, M.; Fishbane, S. Reducing hospital readmissions in patients with end-stage kidney disease. *Kidney Int.* 2015 88(6):1250-1260 doi:10.1038/ki.2015.307.

ESKD patients have a large burden of disease, with high rates of readmission to hospital compared with the general population. A readmission after an acute index hospital discharge is either planned or unplanned. A proportion of unplanned readmissions are potentially avoidable, and could have been prevented with optimized transitional care. Readmissions pose financial cost to the health care system and emotional cost to patients and caregivers. In other chronic diseases with high readmission risk, such as congestive heart failure, interventions have improved transitional care and reduced readmission risk. In reviewing the existing literature on readmissions in ESKD, the definition and risk of readmission varied widely by study, with many potentially associated factors including comorbid diseases such as anemia and hypoalbuminemia. An ESKD patient's requisite follow-up in the outpatient dialysis facility provides an opportunity to improve transitional care at the time of discharge. Despite this, our review of existing literature found no studies which have tested interventions to reduce the risk of readmission in ESKD patients. We propose a framework to define the determinants of avoidable readmission in ESKD, and use this framework to define a research agenda. Avoidable readmissions in ESKD patients is a topic prime for in-depth study, given the high-risk nature in this patient population, financial and societal costs, and potential for risk modification through targeted interventions.

4. Chan, K. E.; Thadhani, R. I.; Maddux, F. W. Adherence barriers to chronic dialysis in the United States. *J Am Soc Nephrol.* 2014 25(11):2642-8 doi:10.1681/asn.2013111160

Hemodialysis patients often do not attend their scheduled treatment session. We investigated factors associated with missed appointments and whether such nonadherence poses significant harm to patients and increases overall health care utilization in an observational analysis of 44 million hemodialysis treatments for 182,536 patients with ESRD in the United States. We assessed the risk of hospitalization, emergency room visit, or intensive-coronary care unit (ICU-CCU) admission in the 2 days after a missed treatment relative to the risk for patients who received hemodialysis. Over the 5-year study period, the average missed treatment rate was 7.1 days per patient-year. In covariate adjusted logistic regression, the risk of hospitalization (odds ratio [OR], 3.98; 95% confidence interval [95% CI], 3.93 to 4.04), emergency room visit (OR, 2.00; 95% CI, 1.87 to 2.14), or ICU-CCU admission (OR, 3.89; 95% CI, 3.81 to 3.96) increased significantly after a missed treatment. Overall, 0.9 missed treatment days per year associated with suboptimal transportation to dialysis, inclement weather, holidays, psychiatric illness, pain, and gastrointestinal upset. These barriers also associated with excess hospitalization (5.6 more events per patient-year), emergency room visits (1.1 more visits), and ICU-CCU admissions (0.8 more admissions). In conclusion, poor adherence to hemodialysis treatments may be a substantial roadblock to achieving better patient outcomes. Addressing systemic and patient

barriers that impede access to hemodialysis care may decrease missed appointments and reduce patient morbidity.

5. Minatodani, D. E.;Berman, S. J. Home telehealth in high-risk dialysis patients: a 3-year study. *Telemed J E Health*. 2013 19(7):520-2 doi:10.1089/tmj.2012.0196

**OBJECTIVE:** This study is a continuation of a previous pilot project that demonstrated improved health outcomes and significant cost savings using home telehealth with nurse oversight in patients with end-stage renal disease undergoing chronic dialysis. We are reporting the results of a larger sample size over a 3-year study period to test the validity of our original observations. **SUBJECTS AND METHODS:** Ninety-nine patients were included in this study; 43 (18 females, 25 males) with a mean age of 58.6 years were enrolled in the remote technology (RT) group, and 56 (26 females, 30 males) with a mean age of 63.1 years were enrolled in the usual-care (UC) group. Health resource outcome measures included hospitalizations, emergency room (ER) visits, and number of days hospitalized. Economic analysis was conducted on hospital and ER charges.

**RESULTS:** Hospitalizations (RT, 1.8; UC, 3.0), hospital days (RT, 11.6; UC, 25.0), and hospital and ER charges (RT, \$66,000; UC, \$157,000) were significantly lower in the RT group, as were hospital and ER charges per study day (RT, \$159; UC, \$317).

**CONCLUSIONS:** The results support our previous findings, that is, home telehealth can contribute to improved health outcomes and cost of care in high-risk dialysis patients.

6. Pines, J. M.;Keyes, V.;van Hasselt, M.;McCall, N. Emergency department and inpatient hospital use by Medicare beneficiaries in patient-centered medical homes. *Ann Emerg Med*. 2015 65(6):652-60 doi:10.1016/j.annemergmed.2015.01.002

**STUDY OBJECTIVE:** Patient-centered medical homes are primary care practices that focus on coordinating acute and preventive care. Such practices can obtain patient-centered medical home recognition from the National Committee for Quality Assurance. We compare growth rates for emergency department (ED) use and costs of ED visits and hospitalizations (all-cause and ambulatory-care-sensitive conditions) between patient-centered medical homes recognized in 2009 or 2010 and practices without recognition.

**METHODS:** We studied a sample of US primary care practices and federally qualified health centers: 308 with and 1,906 without patient-centered medical home recognition, using fiscal year 2008 to 2010 Medicare fee-for-service data. We assessed average annual practice-level payments per beneficiary for ED visits and hospitalizations and rates of ED visits and hospitalizations (overall and ambulatory-care-sensitive condition) per 100 beneficiaries before and after patient-centered medical home recognition, using a difference-in-differences regression model comparing patient-centered medical homes and propensity-matched non-patient-centered medical homes.

**RESULTS:** Comparing patient-centered medical home with non-patient-centered medical home practices, the rate of growth in ED payments per beneficiary was \$54 less for 2009 patient-centered medical homes and \$48 less for 2010 patient-centered medical homes relative to non-patient-centered medical home practices. The rate of growth in all-cause and ambulatory-care-

sensitive condition ED visits per 100 beneficiaries was 13 and 8 visits fewer for 2009 patient-centered medical homes and 12 and 7 visits fewer for 2010 patient-centered medical homes, respectively. There was no hospitalization effect.

CONCLUSION: From 2008 to 2010, outpatient ED visits increased more slowly for Medicare patients being treated by patient-centered medical home practices than comparison non-patient-centered medical homes. The reduction was in visits for both ambulatory-care-sensitive and non-ambulatory-care-sensitive conditions, suggesting that steps taken by practices to attain patient-centered medical home recognition such as improving care access may decrease some of the demand for outpatient ED care.

7. Harel, Z.;Wald, R.;McArthur, E.;Chertow, G. M.;Harel, S.;Gruneir, A.;Fischer, H. D.;Garg, A. X.;Perl, J.;Nash, D. M.;Silver, S.;Bell, C. M. Rehospitalizations and Emergency Department Visits after Hospital Discharge in Patients Receiving Maintenance Hemodialysis. *J Am Soc Nephrol*. 2015 26(12):3141-50 doi:10.1681/ASN.2014060614

Clinical outcomes after a hospital discharge are poorly defined for patients receiving maintenance in-center (outpatient) hemodialysis. To describe the proportion and characteristics of these patients who are rehospitalized, visit an emergency department, or die within 30 days after discharge from an acute hospitalization, we conducted a population-based study of all adult patients receiving maintenance in-center hemodialysis who were discharged between January 1, 2003, and December 31, 2011, from 157 acute care hospitals in Ontario, Canada. For patients with more than one hospitalization, we randomly selected a single hospitalization as the index hospitalization. Of the 11,177 patients included in the final cohort, 1926 (17%) were rehospitalized, 2971 (27%) were treated in the emergency department, and 840 (7.5%) died within 30 days of discharge. Complications of type 2 diabetes mellitus were the most common reason for rehospitalization, whereas heart failure was the most common reason for an emergency department visit. In multivariable analysis using a cause-specific Cox proportional hazards model, the following characteristics were associated with 30-day rehospitalization: older age, the number of hospital admissions in the preceding 6 months, the number of emergency department visits in the preceding 6 months, higher Charlson comorbidity index score, and the receipt of mechanical ventilation during the index hospitalization. Thus, a large proportion of patients receiving maintenance in-center hemodialysis will be readmitted or visit an emergency room within 30 days of an acute hospitalization. A focus on improving care transitions from the inpatient setting to the outpatient dialysis unit may improve outcomes and reduce healthcare costs.