

NATIONAL QUALITY FORUM—Evidence (subcriterion 1a)

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

Measure Title: Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities

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:** ³ 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 ⁴ that the measured intermediate clinical outcome leads to a desired health outcome.
- **Process:** ⁵ a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence ⁴ 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 ⁴ that the measured structure leads to a desired health outcome.
- **Efficiency:** ⁶ 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 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. More than half (55.0%) of all patients with end-stage renal disease (ESRD) visit the ED during their first year of dialysis, and patients with ESRD have a mean of 2.7 visits per patient-year [1]. This rate is 6-fold higher than the national mean rates for US adults in the general population [2]. Measures of the frequency of ED use at the dialysis facility level may help efforts to prevent emergent unscheduled care and control escalating medical costs. 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 and emergent dialysis.

****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.

Programs developed to impact dialysis provider practices have been shown to improve intermediate outcomes (reduced catheter vascular access[3], small solute adequacy, anemia management), hospitalization, and mortality.

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. 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.

Low health literacy has been associated with increased use of ED services [7] and some studies have indicated that patient education interventions can reduce ED utilization [8].

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

<p>Source of Systematic Review:</p> <ul style="list-style-type: none"> • Title • Author • Date • Citation, including page number • URL 	
<p>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.</p>	

Grade assigned to the evidence 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 recommendation 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"> Quantity – how many studies? Quality – what type of studies? 	
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. Centers for Disease Control and Prevention. National hospital ambulatory medical care survey: 2011 emergency department summary tables. <http://www.cdc.gov/nchs/fastats/injury.htm> 2011 [cited 2017 January 9].
3. Ng LJ, Chen F, Pisoni RL, Krishnan M, Mapes D, Keen M, Bradbury BD. Hospitalization risks related to vascular access type among incident US hemodialysis patients. *Nephrol Dial Transplant*. 26(11):3659-66, 2011

BACKGROUND: The excess morbidity and mortality related to catheter utilization at and immediately following dialysis initiation may simply be a proxy for poor prognosis. We examined

hospitalization burden related to vascular access (VA) type among incident patients who received some predialysis care.

METHODS: We identified a random sample of incident US Dialysis Outcomes and Practice Patterns Study hemodialysis patients (1996-2004) who reported predialysis nephrologist care. VA utilization was assessed at baseline and throughout the first 6 months on dialysis. Poisson regression was used to estimate the risk of all-cause and cause-specific hospitalizations during the first 6 months.

RESULTS: Among 2635 incident patients, 60% were dialyzing with a catheter, 22% with a graft and 18% with a fistula at baseline. Compared to fistulae, baseline catheter use was associated with an increased risk of all-cause hospitalization [adjusted relative risk (RR) = 1.30, 95% confidence interval (CI): 1.09-1.54] and graft use was not (RR = 1.07, 95% CI: 0.89-1.28). Allowing for VA changes over time, the risk of catheter versus fistula use was more pronounced (RR = 1.72, 95% CI: 1.42-2.08) and increased slightly for graft use (RR = 1.15, 95% CI: 0.94-1.41). Baseline catheter use was most strongly related to infection-related (RR = 1.47, 95% CI: 0.92-2.36) and VA-related hospitalizations (RR = 1.49, 95% CI: 1.06-2.11). These effects were further strengthened when VA use was allowed to vary over time (RR = 2.31, 95% CI: 1.48-3.61 and RR = 3.10, 95% CI: 1.95-4.91, respectively). A similar pattern was noted for VA-related hospitalizations with graft use. **Discussion.** Among potentially healthier incident patients, hospitalization risk, particularly infection and VA-related, was highest for patients dialyzing with a catheter at initiation and throughout follow-up, providing further support to clinical practice recommendations to minimize catheter placement.

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. Green, J. A.;Mor, M. K.;Shields, A. M.;Sevick, M. A.;Arnold, R. M.;Palevsky, P. M.;Fine, M. J.;Weisbord, S. D. Associations of health literacy with dialysis adherence and health resource utilization in patients receiving maintenance hemodialysis. *Am J Kidney Dis.* 2013 62(1):73-80 doi:10.1053/j.ajkd.2012.12.014

BACKGROUND: Although limited health literacy is common in hemodialysis patients, its effects on clinical outcomes are not well understood.

STUDY DESIGN: Observational study.

SETTING & PARTICIPANTS: 260 maintenance hemodialysis patients enrolled in a randomized clinical trial of symptom management strategies from January 2009 through April 2011.

PREDICTOR: Limited health literacy.

OUTCOMES: Dialysis adherence (missed and abbreviated treatments) and health resource utilization (emergency department visits and end-stage renal disease [ESRD]-related hospitalizations).

MEASUREMENTS: We assessed health literacy using the Rapid Estimate of Adult Literacy in Medicine (REALM) and used negative binomial regression to analyze the independent associations of limited health literacy with dialysis adherence and health resource utilization over 12-24 months.

RESULTS: 41 of 260 (16%) patients showed limited health literacy (REALM score, ≤ 60). There were 1,152 missed treatments, 5,127 abbreviated treatments, 552 emergency department visits, and 463 ESRD-related hospitalizations. Limited health literacy was associated independently with an increased incidence of missed dialysis treatments (missed, 0.6% vs 0.3%; adjusted incidence rate ratio [IRR], 2.14; 95% CI, 1.10-4.17), emergency department visits (annual visits, 1.7 vs 1.0; adjusted IRR, 1.37; 95% CI, 1.01-1.86), and hospitalizations related to ESRD (annual hospitalizations, 0.9 vs 0.5; adjusted IRR, 1.55; 95% CI, 1.03-2.34).

LIMITATIONS: Generalizability and potential for residual confounding.

CONCLUSIONS: Patients receiving maintenance hemodialysis who have limited health literacy are more likely to miss dialysis treatments, use emergency care, and be hospitalized related to their kidney disease. These findings have important clinical practice and cost implications.

8. Morgan, S. R.;Chang, A. M.;Alqatari, M.;Pines, J. M. Non-emergency department interventions to reduce ED utilization: a systematic review. *Acad Emerg Med.* 2013 20(10):969-85 doi:10.1111/acem.12219

OBJECTIVES: Recent health policy changes have focused efforts on reducing emergency department (ED) visits as a way to reduce costs and improve quality of care. This was a systematic review of interventions based outside the ED aimed at reducing ED use.

METHODS: This study was designed as a systematic review. We reviewed the literature on interventions in five categories: patient education, creation of additional non-ED capacity, managed care, prehospital diversion, and patient financial incentives. Studies written in English, with interventions administered outside of the ED, and a comparison group where ED use was an outcome, were included. Two independent reviewers screened search results using MEDLINE, Cochrane, OAlster, or Scopus. The following data were abstracted from included studies: type of intervention, study design, population, details of intervention, effect on ED use, effect on non-ED health care use, and other health and financial outcomes. Quality of individual articles was assessed using Grading of Recommendations Assessment, Development, and Evaluation (GRADE) guidelines.

RESULTS: Of 39 included studies, 34 were observational and five were randomized controlled trials. Two of five studies on patient education found reductions in ED use ranging from 21% to 80%. Out of 10 studies of additional non-ED capacity, four showed decreases of 9% to 54%, and one a 21% increase. Both studies on prehospital diversion found reductions of 3% to 7%. Of 12 studies on managed care, 10 had decreases ranging from 1% to 46%. Nine out of 10 studies on patient financial incentives found decreases of 3% to 50%, and one a 34% increase. Nineteen studies reported effect on non-ED use with mixed results. Seventeen studies included data on health outcomes, but 13 of these only included data on hospitalizations rather than morbidity and mortality. Seven studies included data on cost outcomes. According to the GRADE guidelines, all studies had at least some risk of bias, with four moderate quality, one low quality, and 34 very low quality studies.

CONCLUSIONS: Many studies have explored interventions based outside the ED to reduce ED use in various populations, with mixed evidence. Approximately two-thirds identified here showed reductions in ED use. The interventions with the greatest number of studies showing reductions in ED use include patient financial incentives and managed care, while the greatest magnitude of reductions were found in patient education. These findings have implications for insurers and policymakers seeking to reduce ED use.