



Society for Maternal-Fetal Medicine Special Statement: A critique of postpartum readmission rate as a quality metric

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Hospital readmission is considered a core measure of quality in healthcare. Readmission soon after hospital discharge can result from suboptimal care during the index hospitalization or from inadequate systems for postdischarge care. For many conditions, readmission is associated with a high rate of serious morbidity and potentially avoidable costs. In obstetrics, for postpartum care specifically, hospitals and payers can easily track the rate of maternal readmission after childbirth and may seek to incentivize obstetricians, maternal-fetal medicine specialists, or provider groups to reduce the rate of readmission. However, this practice has not been shown to improve outcomes or reduce harm. There are major concerns with incentivizing providers to reduce postpartum readmissions, including the lack of a standardized metric, a baseline rate of 1% to 2% that is too low to accurately discriminate between random variation and controllable factors, the need for risk adjustment that greatly complicates rate calculations, the potential for bias depending on the duration of the follow-up interval, the potential for the “gaming” of the metric, the lack of evidence that obstetrical providers can influence the rate, and the potential for unintended harm in the vulnerable postpartum population. Until these problems are adequately addressed, maternal readmission rate after a childbirth hospitalization currently has limited utility as a metric for quality or performance improvement or as a factor to adjust provider reimbursement.

Key words: accountability, incentives, Medicare, outcome metrics, process metrics, value

Introduction

In recent years, healthcare networks, hospitals, and payers have become increasingly focused on maximizing the value and quality of their services. “Value” in healthcare is broadly defined by outcomes achieved per dollar spent.¹ Therefore, to maximize value, healthcare systems need to both optimize outcomes and eliminate unnecessary costs. Consequently, healthcare providers, as individuals or groups, are increasingly expected to enter “value-based” agreements or incentive programs that hold them accountable for achieving certain targets according to prespecified quality metrics. A frequently considered metric in such value-based programs is the rate of unplanned readmission after hospital discharge. Readmission is disruptive to patients and their families and is associated with significant morbidity and staggering costs. Among 11.8 million US Medicare beneficiaries who were discharged from a hospital from 2003 to 2004, >2.3 million (19.6%) were rehospitalized within 30 days at an estimated cost of over \$17 billion.² Thus, it is evident that payers, health

systems, providers, and patients should all seek to avoid unnecessary readmissions.

The Centers for Medicare & Medicaid Services (CMS) tracks several risk-adjusted 30-day readmission metrics in its Hospital Readmissions Reduction Program (HRRP)³ and value-based reimbursement programs.⁴ These include an all-causes/all-patients metric⁴ and 6 metrics related to specific medical and surgical diagnoses that predominantly affect the older patient demographic of Medicare beneficiaries.³ CMS reports these metrics publicly on its Hospital Compare website⁵ and uses them to adjust Medicare hospital reimbursement in both fee-for-service and bundled payment models.³ Hospitals are motivated to keep readmission rates low, at least among Medicare beneficiaries, because there are stiff financial penalties if rates are higher than CMS benchmarks.

Maternal readmission after discharge from childbirth hospitalization has become a point of interest for potentially improving value and quality in obstetrics. Payers, eager to reduce costs, and hospitals, seeking to lower their all-cause/all-patient readmission rates, both have an interest in minimizing postpartum readmissions and may therefore propose projects or incentive programs to reduce readmissions after childbirth. However, unlike the CMS

readmission metrics that have been standardized and scrutinized for years, there is no standardized metric for calculating postpartum readmission rates and no agreed-on methodology for its risk adjustment. Furthermore, there is little evidence that the postpartum readmission rate is a valid indicator of the quality of care or that incentivized risk-reduction programs are effective or safe.

This review aims to evaluate the merits and pitfalls of the postpartum readmission rate as a quality metric, especially as applied to differential reimbursement schemes. First, the concept of hospital-wide readmission rate as a quality metric is reviewed. Next, an overview of the HRRP is given because the CMS program provides important general lessons about the benefits, hazards, and limitations of readmission rates, including insights relevant to the specific case of postpartum readmission. Finally, a critique of the notion that postpartum readmission rates should be used to assess, compare, or incentivize providers is presented.

Is Hospital Readmission Rate a Quality Metric?

It seems obvious that readmission soon after hospital discharge may reflect deficiencies in either the care given during the index hospitalization or in the system for postdischarge follow-up care. For example, delayed infection after surgery or bladder catheterization may be caused by inadequate antibiotic prophylaxis or suboptimal antiseptic technique. Hospital-acquired pathogens such as methicillin-resistant *Staphylococcus aureus* or airborne viruses may reflect poor infection-control procedures. Complications from foreign bodies unintentionally retained after surgery clearly reflect a quality-of-care issue. Discharging a patient too early, before the underlying disease process is fully treated, may result in the need for readmission. Suboptimal discharge teaching may increase the risk of readmission because of poor patient understanding and adherence to medication instructions, wound care, follow-up visits, or other aspects of self-management. Flawed medication reconciliation processes may result in adverse medication interactions that trigger the need for readmission. Inadequate coordination of care or lack of community resources for follow-up care may result in complications that require readmission. These issues may be exacerbated by failing to address social determinants of health such as lack of transportation or inability to obtain childcare or leave work to attend follow-up visits, all of which may disparately affect vulnerable groups defined by race or socioeconomic conditions.

However, not all readmissions reflect deficiencies in care during the index hospitalization or in the outpatient follow-up care system. Many are caused by the onset of new diseases unrelated to the original hospitalization or progression of chronic disease, irrespective of the care given. It is estimated that only 9% to 48% of readmissions are associated with substandard care during the index hospitalization, such as incomplete treatment of the main problem, unstable status at discharge, or inadequate postdischarge care.⁶ Most

readmissions are thus attributable to unmodifiable causes and are judged to be unpreventable. The high proportion of unpreventable readmissions greatly limits the usefulness of readmission rate as a quality metric.^{6,7} It also means that the goal cannot realistically be a zero rate of readmission, but rather that targets must be set thoughtfully on the basis of benchmarking and risk adjustment.

Although CMS considers its readmission metrics to be “outcome” measures, hospital readmission is actually a process rather than a health outcome. The readmission process does not add value unless it can be shown to drive improvement in actual clinical patient outcomes such as mortality, severe morbidity, or patient functional status.⁸ Indeed, “cost reduction without regard to the outcomes achieved is dangerous and self-defeating, leading to false ‘savings’ and potentially limiting effective care.”¹ If a patient dies after being sent home from a postdischarge emergency visit rather than being readmitted, the readmission rate may be reduced but the patient outcome is clearly worse. Therefore, readmission rate by itself does not adequately reflect the care given unless it is accompanied by balancing metrics such as rates of mortality or severe morbidity.

The *raison d’être* for hospitals and healthcare providers is to improve outcomes by providing care, not denying it. Readmission is appropriate care in many circumstances, so programs that discourage readmission may have unintended consequences, especially if they are not thoughtfully approached and tracked. Programs intended to increase value should be weighted so that mortality and other health outcomes matter more than processes like readmission.⁹ Yet, it has been estimated that under the CMS HRRP, a hospital’s incentive for reducing readmissions is 6 to 10 times greater than the incentive for reducing mortality.⁹

Although questions about the utility of using readmission rates as quality metrics have persisted for more than 20 years,^{6,7,9} hospitals and health systems remain keenly focused on readmission rates because the HRRP imposes financial penalties for rates that are deemed too high.

Overview of the Hospital Readmissions Reduction Program

Establishment of the HRRP was mandated by the Patient Protection and Affordable Care Act of 2010 (ACA).³ The ACA requires CMS to reduce payments to hospitals participating in the Inpatient Prospective Payment System if they have excess readmissions. CMS states that the program “encourages hospitals to improve communication and care coordination to better engage patients and caregivers in discharge plans and, in turn, reduce avoidable readmissions. The program supports the national goal of improving healthcare for Americans by linking payment to the quality of hospital care.”

CMS analyzes 3 types of readmission: all-cause, unplanned, and potentially preventable.¹⁰ Unplanned and potentially preventable readmissions are defined by complex algorithms that analyze diagnosis and procedure

codes from both the index hospitalization and the rehospitalization. Only preventable readmissions are amenable to potential improvement, but the HRRP financial penalties are based on the all-cause rates. The CMS algorithm scores about 63% of readmissions as potentially preventable, higher than other estimates.⁶

All-cause readmission rates for Medicare recipients nationwide declined steadily after the passage of the ACA, from 17.7% in 2009 to 15.1% in 2019, an absolute reduction of 2.6%.^{10,11} Readmission rates for the 6 specific conditions tracked under the HRRP have also shown an absolute decline of approximately 2%.¹⁰ The magnitude of the decline (relative risk [RR], 0.85) is similar to the RR of 0.82 reported in a meta-analysis of earlier intervention trials.¹² CMS estimated that the HRRP saved \$556 million in 2018 by penalizing hospitals with high readmission rates.¹⁰

Concerns have been raised that the observed reduction in readmissions under HRRP may not actually reflect improved care but rather hospitals “gaming” the metrics. Gaming implies the use of strategies that improve the metric without improving the underlying care or clinical outcomes. The variety of potential gaming strategies includes upcoding the severity of illness in the index hospitalization to yield a more favorable risk adjustment,¹³ keeping patients on observation status rather than readmitting them, delaying readmission until after the 30-day window, and discouraging providers from readmitting patients who might benefit from rehospitalization.^{13,14} Despite the potential for abuse, however, there is evidence that these gaming practices are not widespread.^{10,15,16}

The potential for unintended harm has concerned several investigators who reported that lower readmission rates are associated with higher mortality rates, especially among patients with heart failure.^{17–22} The increased mortality is found among those not readmitted, suggesting that some deaths might have been preventable if the patients had been readmitted.²⁰ However, the apparent excess in mortality is found only in raw mortality rates and not confirmed in risk-adjusted rates.^{10,20}

Penalties for high readmission rates have been disproportionately levied against large hospitals, teaching hospitals, and safety-net hospitals.²³ It is not clear to what extent the higher readmission rates at these types of facilities are attributable to differences in quality of care, differences in the medical complexity (case mix), or differences in the socioeconomic mix of the patient population. Safety-net hospitals may have less access to high-quality after-hospital care.²⁴ They may have a higher proportion of patients from disadvantaged groups, who are more likely to be discharged to an institution rather than to home²⁵ and who have higher readmission rates.²⁶ Safety-net hospitals may have a disproportionate number of patients with social and cultural challenges such as poor language skills, low health literacy, or lack of access to food, housing, and transportation.^{27,28} To address the inequity of disproportionately penalizing hospitals that provide care to the most vulnerable

patients, the 21st Century Cures Act of 2016 requires CMS to benchmark each hospital’s performance compared with hospitals with similar characteristics, rather than all other hospitals.³ The new benchmarking methodology went into effect in 2019, so whether it mitigates the problem is still unknown.

Maternal Postpartum Readmission Metrics

Experience with the CMS readmission metrics provides a background for assessing the merits of potential postpartum readmission metrics. Several considerations are summarized in the [Table](#).

Because of its apparent simplicity, the postpartum readmission rate is a tempting target for hospitals or payers either as a quality metric or as a benchmark for value-based contracting. It seems straightforward to calculate the rate based on claims data available to both hospitals and payers. The denominator is the number of persons hospitalized for childbirth, and the numerator is the number of those readmitted within a given number of days postpartum.

The overall rate of maternal postpartum readmission has typically been 1% to 2% in various reports during the past 2 decades,^{29–46} much lower than the 10% to 30% rates in the HRRP.^{2,10,11} The postpartum readmission rate is undoubtedly lower because obstetrical patients are younger and healthier as a group and because the index hospitalization most often involves a normal physiological process (childbirth) rather than a serious disease. The low rate presents a challenge in comparing readmission rates among provider groups, individual obstetrical providers, facilities, and time periods. For a provider who delivers 100 patients with 2 postpartum readmissions during a given year, the readmission rate appears to be 2%, but the 95% confidence interval ranges from 0.35% to 7.7%; in other words, wide year-to-year fluctuations in the provider’s readmission rate can be the result of random variation rather than the provider’s quality of care. In comparing 2 provider groups with typical readmission rates of 2% and 4% (a 2-fold relative difference), power estimates indicate that both groups would need to have >1140 births per year to yield an 80% chance that the difference will reach statistical significance. If a payer wants to incentivize a group to reduce its readmission rate from 3% to 2%, >3500 deliveries per year would be needed for the difference to have an 80% chance of reaching statistical significance. In summary, low readmission rates imply that there is insufficient precision to assess individual differences or changes over time unless the rates are based on a large number of births.

There are many known risk factors and comorbidities associated with higher rates of postpartum readmission. These include maternal medical conditions (hypertensive disorders, diabetes, asthma, obesity, sickle cell disease, depression, and other psychiatric disorders), pregnancy and birth conditions (cesarean delivery, operative vaginal birth, preterm birth, multifetal pregnancy, long labor,

TABLE

Considerations regarding the use of maternal postpartum readmission rate as a quality metric

Topic	Considerations
Intuitive rationale	Obvious that readmission rate can be increased if there is suboptimal care during birth hospitalization or suboptimal postdischarge follow-up
Intuitive simplicity	Rate can easily be calculated from diagnosis and procedure codes in claims data (see caveat under "risk factors" below)
Low baseline rate	<ul style="list-style-type: none"> • A 1% to 2% typical baseline rate means poor precision (wide confidence intervals) unless rate depends on a large number of births, making the metric not useful for assessing individuals or provider groups • Not much room for improvement
Risk factors, confounders	<ul style="list-style-type: none"> • More than 20 known risk factors associated with increased readmission rate • Appropriate assessment of rate requires complex multivariable statistical analysis, which may be beyond the capabilities of providers, hospitals, or payers
Readmission diagnoses	<ul style="list-style-type: none"> • Widely varying reasons for readmission • No validated algorithm for distinguishing preventable from nonpreventable readmissions • Insufficient baseline data to determine the percentage of readmissions that are potentially preventable
Predictability of readmission	<ul style="list-style-type: none"> • Models based on blood pressure during index hospitalization and other clinical characteristics have moderate predictive accuracy • Predictability does not imply preventability of readmission
Duration of at-risk interval	<ul style="list-style-type: none"> • Endorsed hospital-wide metrics: 30 d postdischarge • Traditional duration of puerperium: 42 d postbirth • In some studies: 60 d or more • Potential bias in using postbirth vs postdischarge interval • No standardized metric
Potential for "gaming"	<ul style="list-style-type: none"> • Upcoding • Using observation status rather than admission status • Delay readmission until after the interval specified in metric • Deny readmission to patients who need to be hospitalized
Potential for unintended adverse outcomes	Avoidance of readmission for patients with indications for admission may result in: <ul style="list-style-type: none"> • Death • Stroke • Sepsis • Pulmonary embolism • Other severe maternal morbidity
Effect on hospital-wide readmission metric	<ul style="list-style-type: none"> • The 6 specific conditions tracked by HRRP for Medicare beneficiaries are rare in obstetrical patients • NQF #1789 is limited to Medicare beneficiaries ≥ 65 y • Virtually no obstetrical patients meet these criteria, therefore maternal postpartum readmissions have negligible effects on hospital-wide metrics tracked by CMS
Strategies to reduce postpartum readmission rate	<ul style="list-style-type: none"> • Increasing length of stay during index hospitalization unlikely to be cost-effective • Paucity of evidence that rate can be reduced by improving discharge teaching, medication reconciliation, and coordination of postdischarge care • Opportunities to consider optimizing postpartum care through modified intervals, telehealth, doula support, home visit

CMS, Centers for Medicare and Medicaid Services; HRRP, Hospital Readmission Reduction Program; NQF, National Quality Forum.

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postpartum hemorrhage, fever, or severe maternal morbidity during the birth hospitalization), older maternal age, smoking, other substance use disorders, and social determinants of health (experienced racism, public insurance status, low income, birth at a "safety-net" hospital).^{29,33,35,37,43–61} The RR of readmission or adjusted

odds ratio for some of these factors is 3 or more. Therefore, appropriate assessment of the postpartum readmission rate should include either stratification or statistical adjustment for these confounders and covariates, which adds tremendous complexity to the calculation. Diagnosis and procedure codes for each risk factor must be captured for every

case and then entered into a multivariable model such as logistic regression. Many hospitals and some payers lack the statistical expertise to do this properly. Providers rarely have this capability.

Common indications for postpartum readmission include hypertensive disorders, delayed postpartum hemorrhage, infections (wound, uterus, urinary tract, nonurogenital), psychiatric problems, and diabetes.^{31,33,54,56} The relative frequencies of these vary between different reports. Less common indications include venous thromboembolism (VTE), peripartum cardiomyopathy, sickle cell crisis, and other medical and surgical diagnoses.^{31,49,53,62}

It is not readily apparent which of the many reasons for readmission might be classified as potentially preventable. For hypertensive disorders, for example, some readmissions may be patients with chronic hypertension, gestational hypertension, or preeclampsia during the birth hospitalization. If such patients have exemplary discharge teaching, appropriate medication management, and close postpartum follow-up, they may be less likely to require readmission.⁶³ Conversely, the American College of Obstetricians and Gynecologists recommends that patients with severe hypertension during hospitalization be seen within 3 days after discharge,⁶³ in part to detect exacerbations of hypertension that are common during the first few days. Earlier detection might actually increase the rate of readmission. Moreover, some readmissions for hypertension occur in individuals who have no antecedent history of hypertension or preeclampsia.^{51,61} It is difficult to see how such readmissions might be prevented. In the absence of a validated algorithm, distinguishing preventable from non-preventable readmissions would require manual chart review and subjective judgments. At present, there is not sufficient baseline data to know what percentage of postpartum readmissions are potentially preventable. If most readmissions are not preventable, it would seem futile to devote resources toward quality improvement efforts and inappropriate to differentially compensate providers based on their readmission rates.

Prediction of postpartum readmission among patients with hypertensive disorders has been attempted based on inpatient blood pressure values⁶⁴ and other clinical characteristics.⁶⁵ In both studies, the prediction models had C-statistics of 0.8 to 0.85, translating to 80% sensitivity at a false-positive rate of 30% to 40%. It is not immediately obvious how one might use the prediction to guide management. We are not aware of evidence that the postpartum readmission rate can be altered by delaying discharge, increasing antihypertensive medication, or increasing the frequency of follow-up.

There is no standardized definition of the follow-up interval used in the calculation of postpartum readmission rates. Many of the reports cited above were based on readmissions within 42 days postbirth, the traditional duration of the puerperium; others were based on 30 days postdischarge, analogous to the CMS hospital-wide

metrics, and a few were based on other intervals ranging from 28 days to 1 year. Intuitively, shorter intervals are more likely to reflect readmissions related to the birth and longer intervals are more likely to be because of unrelated conditions. Most postpartum readmissions cluster within the first 2 weeks,^{30,32,57} so the difference between using a 30-day vs 42-day interval is likely small. A small but potentially important bias is introduced by using postbirth intervals rather than post-discharge intervals. Patients are only at risk of readmission after they have been discharged; therefore, those with a longer length of postpartum stay during the index hospitalization (eg, cesarean delivery, severe maternal morbidity, severe hypertension) will have a shorter at-risk period if the rate is calculated depending on postbirth days.⁶⁶ There is a clear need for a standardized metric if one is to be used at all.

As with hospital-wide metrics, the potential for “gaming” the metric exists if providers are financially incentivized to reduce postpartum readmission rates. Possible gaming strategies include overstatement of comorbidities to improve risk adjustment statistics, placing patients on observation status rather than admission status, and in some cases, delaying readmission until after the defined interval has elapsed. The worst gaming involves avoiding a medically necessary readmission in a patient who might benefit from it, such as a patient with severe hypertension, infection, or VTE. In such cases, relegating the patient to outpatient management in lieu of readmission may result in stroke, sepsis, pulmonary embolism, or death. Fundamentally, the pressure to avoid postpartum readmissions is at odds with efforts to reduce maternal mortality and morbidity by educating patients to seek prompt evaluation of urgent warning symptoms and imploring providers not to minimize the seriousness of postpartum symptoms.^{67–69}

Hospitals may assume that reducing the postpartum readmission rate will help reduce the hospital-wide all-cause readmission metric calculated and reported by CMS for some of its reimbursement programs. However, the CMS all-cause metric is limited to Medicare beneficiaries ≥ 65 ,⁴ effectively excluding obstetrical patients. Furthermore, the 6 diagnosis-specific conditions in the HRRP³ are rare in obstetrical patients. Therefore, postpartum readmissions are unlikely to have any effect on hospital-wide readmission rates as measured by CMS.

Improving Postpartum Readmission Rates

One approach to evaluating opportunities for quality improvement is to evaluate whether there are variations among providers or hospitals.^{10,70} Interhospital comparisons show postpartum readmission rates ranging from $<0.3\%$ to 5% (median, 1.01%).³⁴ However, patient factors account for most of the interhospital variance, with only 0.11% of the variance attributable to hospital-level factors.³⁵ Hospitals with high postpartum readmission rates tend to have more patients whose social determinants of

health (insurance, income, race/ethnicity) would place them at higher risk. In other words, financial incentives based on readmission metrics may penalize facilities or providers with certain patient characteristics even though they may provide high-quality care.³⁵ Risk adjustment may mitigate this tendency but is unlikely to completely eliminate it.

There is a paucity of evidence at this time that providers can reduce the postpartum readmission rate through quality improvement efforts. One idea is that increasing the postpartum length of stay during the birth hospitalization may provide more opportunity for discharge teaching and coordination of care and for optimizing the medical management of hypertension, diabetes, puerperal infections, and other conditions. Some studies have found that longer lengths of stay are associated with lower postpartum readmission rates,^{30,45} but others have found no such association.^{42,60,71} Moreover, even if increasing the average length of stay by 1 day reduced the postpartum readmission rate from 2% to 0%, this would probably not be cost-effective because 100 additional inpatient days during the birth hospitalization would be needed to prevent 2 postpartum readmissions.

More likely strategies to reduce readmissions, with lower risk for harm or unintended ill effects, would be to focus on the discharge process and the transition to outpatient care. Promising ideas include culturally appropriate discharge teaching using proven techniques such as teach-back, patient-friendly discharge materials, coordination of outpatient follow-up while the patient is still hospitalized, and emphasis on the importance of adherence to medications and follow-up care. Telehealth, doula support, home visits, and modified intervals for earlier and ongoing postpartum care may also provide opportunities for improvement.⁶⁷ Although there is somewhat limited evidence that such strategies may reduce hospital-wide readmission,^{12,72,73} we are not aware of evidence that they can affect the rate of postpartum readmission specifically. Future research is needed to evaluate whether these interventions are truly effective and safe.

Conclusion

There are fundamental problems with using maternal postpartum readmission rates as a quality metric, especially for driving differential reimbursement. There is currently no evidence that using the readmission rate in this way will improve outcomes, and there are serious concerns about the potential for harm. We agree with the conclusion reached by Clarke almost 20 years ago: "The time must come when we give up measuring unsatisfactory performance indicators simply because they are available and, instead, concentrate harder on allowing for the known valid measures of the quality of care to be collected as a matter of routine."⁷ Payers and watchdog groups should resist the temptation to use postpartum readmission metrics just because the data are readily available. Providers, provider groups, and hospitals should resist any proposed

reimbursement structures that tie financial incentives to reductions in the postpartum readmission rate. ■

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