

# Unintended Harm Associated With the Hospital Readmissions Reduction Program

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**Health care expenditures** continue to increase in the United States, and there have been considerable efforts over the past decade to use health policies, financial incentives, and alternative payment models to address this important issue. Starting in 2007, the Centers for



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Medicaid & Medicare Services (CMS) sought to reduce early readmissions for common medical conditions among Medicare beneficiaries. The CMS policy approaches included increasing transparency through public reporting of hospital 30-day risk standardized readmission rates (2007-2009 discharges) starting in 2009 and providing financial incentives tied to readmissions through the Hospital Readmissions Reduction Program (HRRP), passed under the Patient Protection and Affordable Care Act of 2010.<sup>1</sup> The HRRP imposed financial penalties on hospitals based on rates of 30-day risk-standardized hospital readmission for heart failure, acute myocardial infarction, and pneumonia, with up to 3% of a hospital's total Medicare revenue from admissions for any condition (target or nontarget) at risk. In fiscal year 2018, 80% of the hospitals subject to the HRRP have been penalized, amounting to \$564 million in reduced payments by Medicare.<sup>2</sup>

The introduction of the HRRP was associated with reductions in hospital readmissions nationally, and the program has been declared a success and worthy of expansion by policy makers.<sup>3-5</sup> But, the initial reports that evaluated the HRRP presented temporal changes in readmission rates without fully evaluating how those reductions were achieved or whether there were any unintended consequences. From the inception of the 30-day readmission measure for public reporting and the HRRP, significant concerns have been raised regarding whether the 30-day readmission rate is an accurate measure of hospital quality and a valid basis for financial penalties to be applied.<sup>6-9</sup> Because the readmission model is risk adjusted based on administrative claims, concerns have been raised that it cannot adequately adjust for illness severity or medical complexity and is subject to variation in coding, which can result in hospitals being penalized based on the patients they care for rather than the quality of care provided.<sup>6</sup>

This policy has offered strong financial incentives for hospitals to reduce 30-day readmission rates for target conditions, but it has been implemented without any additional resources being provided to hospitals, without the provision of evidence-based guidance on how to safely and effectively achieve the stated readmission goals, and without any prospective testing.<sup>8,9</sup> Although the large financial penalties were

intended to incentivize hospitals to invest in improved transitions of care, these penalties may have instead encouraged restriction of necessary inpatient care within the first 30 days of hospital discharge through inappropriate triage strategies in emergency departments, increased use of observation stays when inpatient admissions would have been warranted, and delayed clinically indicated readmissions just beyond discharge day 30.<sup>8,9</sup>

It now appears that the reductions in readmissions for targeted conditions, including heart failure, acute myocardial infarction, and pneumonia, after the implementation of the HRRP were not the result of improved transitional care quality, which would have decreased unplanned returns to the hospital within the first 30 days. Instead, the apparent reductions were largely driven by unplanned returns to the hospital within 30 days of being directly discharged from the emergency department or coded as observation stays.<sup>5</sup> Because the financial penalties have been applied disproportionately on teaching and safety net hospitals, the HRRP also may have hindered the ability of these hospitals to provide care for vulnerable and sicker populations, who are at the highest risk for poor outcomes.<sup>6,8</sup> Further, the exclusive focus on reducing 30-day hospital readmissions may have diverted the attention and resources of hospitals from other quality improvement efforts and patient safety.<sup>8,9</sup>

Evidence has emerged suggesting the concerns regarding potential unintended consequences of the HRRP may be justified. While associated with reductions in 30-day inpatient readmissions for all 3 initially targeted conditions, the HRRP was also associated with an increase in unadjusted and risk-adjusted postdischarge mortality in patients with heart failure, the patient population potentially most vulnerable to alterations in care.<sup>8-10</sup> Using an interrupted time-series analysis approach, an analysis of clinical data from Get With The Guidelines - Heart Failure linked to Medicare data demonstrated an increase in 30-day and 1-year mortality associated with the implementation of the HRRP.<sup>10</sup> The findings of potential harm were consistent in multiple sensitivity analyses and in all subgroups studied. Evaluation of the full Medicare database also revealed a similar 1.3% absolute increase in 30-day risk-adjusted mortality in patients with heart failure after the implementation of the HRRP starting after 2010,<sup>4,9</sup> whereas previous reports had indicated that from 1999 to 2010, 30-day unadjusted and risk-adjusted mortality rates had been declining.<sup>9</sup> Additional studies have reported an increase in risk-adjusted mortality when analyzed 30 days from hospital admission or 30 days from discharge.<sup>8,11</sup>

In contrast, other studies have reached different conclusions. An analysis of Medicare data at the hospital level reported a small inverse correlation between hospitals' 30-day risk-adjusted readmission rates and 30-day risk-adjusted postdischarge mortality rates for heart failure.<sup>4</sup> Nevertheless, the hospitals in which readmission declined still had an absolute increase in 30-day postdischarge risk-adjusted mortality among patients with heart failure after the implementation of the HRRP. A Medicare Payment Advisory Committee analysis found an increased mortality rate in patients with heart failure, even when in-hospital deaths were included.<sup>5</sup> However, this report contended that the increase in mortality was caused by a marked increase in illness severity over time for patients who were admitted, even though unadjusted in-hospital mortality was declining over time without change in the length of stay. Khera et al reported an increase in unadjusted and risk-adjusted 30-day postdischarge mortality rate for patients with heart failure; however, the authors concluded that the increase in mortality began before the HRRP implementation in 2010 without significant slope change and thus was unrelated to the policy.<sup>12</sup> However, the period used for comparison before the HRRP in this study was January 2006 to March 2010, which encompasses a time during which the 30-day readmission metric was announced and public reporting had already begun.

In this issue of *JAMA*, to help address the uncertainty regarding changes in mortality associated with the implementation of the HRRP, Wadhera and colleagues<sup>13</sup> report findings from a patient-level analysis that included 8.3 million hospitalizations of Medicare beneficiaries for heart failure, acute myocardial infarction, and pneumonia. The authors analyzed patient outcomes for 4 different periods from April 1, 2005, to March 31, 2015, and, to account for potential differences in case-mix severity between study periods, used a propensity score approach to standardize the study population among the different periods.<sup>13</sup>

Among patients with heart failure (3.2 million hospitalizations and 270 517 deaths within 30 days of discharge), there was an increase in 30-day postdischarge mortality that began before the HRRP announcement (although during the period in which the readmission measure was used for public reporting).<sup>13</sup> Compared with the baseline trends in mortality for heart failure, the announcement and implementation of the HRRP were independently associated with a significant acceleration in the increase in 30-day postdischarge mortality, with a 0.49% increase between the change from 2007 to 2010 and 2010 to 2012 after the announcement of the HRRP (difference in change, 0.22%;  $P = .01$ ) and a 0.52% increase between the change from 2010 to 2012 and 2012 to 2015 after the implementation (difference in change, 0.25%;  $P = .001$ ).<sup>13</sup>

Among patients with acute myocardial infarction (1.8 million hospitalizations and 128 088 deaths within 30 days of dis-

charge), the HRRP announcement was associated with a decline in postdischarge mortality (0.18% increase before the announcement vs 0.08% decline following the announcement; difference in change,  $-0.26\%$ ;  $P = .01$ ) and did not significantly change after the HRRP implementation. Among patients with pneumonia (3.0 million hospitalizations and 246 154 deaths within 30 days of discharge), the 30-day postdischarge mortality rate was stable before the announcement of the HRRP, but significantly increased following the HRRP announcement (0.26% increase; difference in change, 0.22%;  $P = .01$ ) and implementation (0.44% increase; difference in change, 0.40%;  $P < .001$ ).<sup>13</sup>

The analysis also demonstrated that the overall increase in mortality associated with the HRRP was mainly driven by patients who were not readmitted to the hospital, but who died within 30 days of discharge.<sup>13</sup> This finding, in particular, enhances the likelihood of a causal relationship between the HRRP financially incentivized restricting of inpatient readmissions and the harm observed. Multiple sensitivity analyses, including regression analyses and analyses that accounted for changes in hospice use, yielded consistent findings.<sup>13</sup> Even when inpatient deaths were accounted for, with analyses of mortality in the first 45 days from admission, additional mortality increases among patients with heart failure were observed to be associated with the HRRP announcement. However, in the analysis of mortality within 45 days of admission, the increase in mortality observed among patients with pneumonia was attenuated and no longer statistically significant. The authors appropriately acknowledge the limitations of the analyses, including the observational nature of the research, the use of administrative data to risk adjust, and the potential for changes in severity coding over time to influence the findings.

This study provides important new insights into the association of the HRRP with increases in mortality among patients hospitalized for heart failure, and raises additional concerns regarding potential unintended harms among patients with pneumonia. Irrespective of the intent of the policy, there is no evidence that patients have benefited from the HRRP. Yet, taken together with previous studies<sup>4,10,11</sup> there is now independently corroborated evidence that the HRRP was associated with increased postdischarge mortality among patients with heart failure and new evidence that the HRRP was associated with increased mortality among patients hospitalized for pneumonia. In light of these findings, it is incumbent upon Congress and CMS to initiate an expeditious reconsideration and revision of this policy. Alternative strategies can be deployed to more effectively achieve the goal of reducing avoidable readmissions, improve patient-prioritized outcomes like health status, while better protecting patients from unintentional harms, including preventable deaths.

#### ARTICLE INFORMATION

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**Conflict of Interest Disclosures:** Dr Fonarow reports research support from the National

Institutes of Health, consulting with Abbott, Amgen, Janssen, Novartis, and Medtronic, and serving as a Get With The Guidelines Steering Committee member.

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