Since 2008, the Centers for Medicare and Medicaid Services have publicly reported risk standardized 30-day readmission rates for patients hospitalized with heart failure, acute myocardial infarction (AMI), and pneumonia. Over the next few years, the portfolio of readmission measures will expand to include patients with a broad range of medical and surgical conditions. Furthermore, under the Hospital Readmissions Reduction Program of the Affordable Care Act, hospitals with higher-than-average readmission rates will be subject to a payment penalty. The stakes are high for hospitals, with millions of dollars of Centers for Medicare and Medicaid Services payments at risk, and hospitals are trying to identify and implement effective strategies for reducing readmissions.

One promising approach to reducing 30-day readmissions has been to increase rates of follow-up occurring within 7 days of hospital discharge. In 2010, Hernandez et al examined a population of heart failure patients and demonstrated that hospitals with a higher proportion of patients seen within 7 days of discharge had statistically and clinically significantly lower 30-day readmission rates compared with hospitals that had the lowest proportions of patients seen soon after discharge. Intuitively, this finding makes a lot of sense. Early follow-up appointments provide an opportunity for clinicians to reassess the patient’s condition and address any outstanding issues regarding medications, patient education, and need for additional testing. Furthermore, ensuring that patients have appropriate follow-up (although not necessarily within 7 days) has been a central component of care transition programs shown previously to reduce readmission rates. For clinicians and hospitals struggling to reduce readmission rates, this article was a welcome relief. Finally, we had a strategy that was effective, easy to implement, required relatively few additional resources, and, perhaps most importantly, was scalable to a variety of patient populations. In large part because of this study, many hospitals have embarked on efforts to prioritize early follow-up, in some cases setting up clinics specifically designed to meet this new expectation.

In this context, the findings of Hess et al published in the current issue of *Circulation* are an unwelcome but important wake up call. In this study, the authors asked the very reasonable question of whether these results were generalizable to different patient populations, in this case patients hospitalized with non-ST-segment elevation myocardial infarction. To minimize confounding, the investigators took advantage of the natural variation in hospital rates of early follow-up and analyzed outcomes at the hospital level rather than the patient level. Their approach was almost identical to that of Hernandez et al, but the results were stunningly negative. Higher rates of early follow-up among patients with AMI were not associated with differences in 30-day readmission rates. In fact, it is hard to imagine a more completely and consistently negative study. Not only was the overall association negative (adjusted odds ratio per 5% increase in rate of early follow-up was 0.99 [95% CI, 0.97–1.02]), but it was also absent in every possible subgroup analysis.

Was this an issue of inadequate sample size? With >26000 patients in the analysis, it would be hard to imagine they lacked statistical power, but gauging this is more challenging for hospital-level than patient-level analyses. The ability to detect clinically meaningful differences depends not only on the number of patients and underlying event rate but on the number of hospitals, the distribution of patients within those hospitals, and the amount of variation between hospitals with regard to the exposure of interest. As more health services researchers take advantage of natural variation to conduct comparative effectiveness research, we will need to develop a new set of ground rules so that investigators can determine a priori whether this approach is appropriate given their data. In this case, even in the absence of formal power calculations, it is reasonable to assume that the study had adequate statistical power if for no other reason than the fact that they had similar numbers of patients and hospitals to the study by Hernandez et al and comparable variation in hospital rates of early follow-up.

Similarly, the conflicting results cannot be attributed to methodology, because the analytic approaches were virtually identical. So what was driving the differences in results? The authors speculate that the factors responsible for readmission may differ by condition, and this explanation has some face validity. Early follow-up may be more important in patients with heart failure than in patients with AMI in that it provides an opportunity to maintain or improve the delicate balance of volume status. Nevertheless, more than a quarter of the patients included in the current analysis had concomitant heart failure, and many patients had multiple comorbidities. As such, many of the putative benefits of early physician follow-up—reconciling medication errors, reinforcing patient

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education, and developing a plan if symptoms should recur—should have benefited patients with AMI.

Of note, in the study by Hernandez et al., there was no dose response observed with progressively higher rates of early physician follow-up. The harm associated with low rates of early follow-up was only observed among patients treated at hospitals in the lowest quartile of early follow-up, and readmission rates did not differ among the second, third, and fourth quartiles. This finding raises the possibility of a threshold effect. Hospitals and healthcare systems may need to have enough capacity to accommodate early follow-up when necessary but not necessarily expand their capacity to see every patient within 7 days. From this perspective, the findings of Hess et al. start to look more similar than different in that readmission rates were largely comparable irrespective of hospital rates of early follow-up. The threshold for harm for patients with AMI may simply be lower than that of patients with heart failure and may have been undetectable given the way that the investigators categorized hospitals.

At the end of the day, the findings of Hess et al. challenge one of our assumptions about how we can effectively reduce readmission rates. The surprising and somewhat inexplicable results place clinicians, hospitals, and healthcare organizations in a tough position to which there are 3 potential responses: (1) abandoning early follow-up as a strategy to reduce readmissions; (2) selectively promoting early follow-up in patients with specific conditions; or (3) ignoring the uncertainty and promoting early follow-up for all of the patients discharged from the hospital. The decision is not inconsequential. Although promoting early follow-up seems like a relatively benign intervention, there are opportunity costs, particularly in health systems where resources and outpatient capacity are limited. Putting these studies into perspective, in the absence of a clear and consistent finding of the effectiveness of early follow-up on lowering readmission rates, providing early follow-up for all or even most patients is probably unnecessary. Nevertheless, we need strategies to smooth the transition from the inpatient to the outpatient setting, and early follow-up may be important and effective when used selectively for patients at highest risk of readmission. So is early follow-up the baby or the bathwater? At this point it is too early to tell. What is clear is that we need investigators to continue to challenge our assumptions until we finally develop a toolbox of effective (and cost-effective) strategies to reduce readmission rates.

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