By C. van Walraven

Risk of Death or Readmission Is Highest for Friday Discharges from Hospital

Ever notice colleagues are especially sluggish at Monday morning meetings? Do you find physicians in your hospital are significantly less likely to attend rounds that occur on Wednesday afternoon? Have you found that public announcements that have the potential to damage to your hospital's reputation seem to be less so when they are released on Friday afternoons?

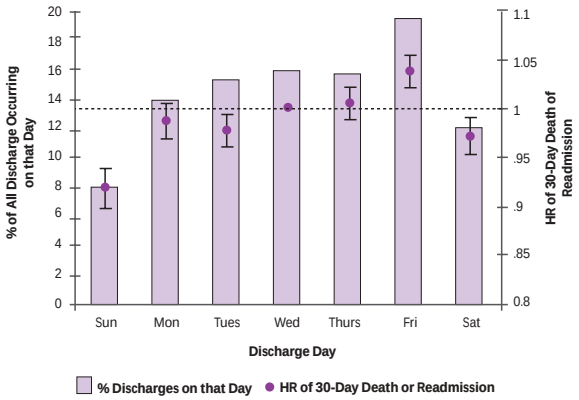
It is no secret to most administrators that the timing of an event or intervention has significant influence upon its outcome or implications. It turns out that patient care is also sensitive to timing. Intensive care unit patients who were discharged to the floor between 10 p.m. and 7 a.m. had an adjusted in-hospital mortality that was 50% higher than that for other patients (Goldfrad and Rowan 2000). Last year, Drs. Bell and Redelmeier from the Institute for Clinical Evaluative Sciences showed that patients admitted on weekends with particular diagnoses had higher in-hospital mortality than those admitted on weekdays (Bell and Redelmeier 2001).

These observations led us to hypothesize that patients who are discharged on Fridays might have a worse outcome (van Walraven and Bell 2002). We know that Friday is the most common hospital discharge day (Basinski 1994). A greater number of discharges could result in patients receiving less discharge instructions from hospital staff (Alibhai et al. 1999), which, in turn, could result in worse outcomes. Perhaps because of decreased staffing on the weekend (Moore 1984) and physician cross-coverage, patients might preferentially be discharged on Friday rather than the subsequent weekend days. This could result in some Friday discharges being less medically stable than those discharged on other days of the week. Finally, new home health and social support services for weekend discharges often do not get initiated until the following Monday. If this occurs to Friday discharges that need these services initiated immediately, poor outcomes might result.

To determine whether or not Friday discharges do worse, we used the CIHI Discharge Abstract Database (DAD) to identify all adult, living hospital discharges to the community between March 1990 and March 2000 in Ontario. Only non-elective admissions were included in the study. The DAD was used to determine, for each patient, factors that could influence the risk of hospital readmission or death. These included patient age, sex, co-morbidities, whether there had been a non-elective hospitalization during the previous six months, hospital length of stay, whether a procedure had been performed and whether a complication occurred. All of these factors have been shown in various other studies to predict death or readmission after discharge from hospital (Deyo et al. 1992). We determined the association of discharge day with the risk of 30-day non-elective hospital readmission (measured using the DAD) or death (measured using the Registered Patient Database) after controlling for all of these factors.

More than 2.4 million patients were included in the study. As expected, Friday was the most common discharge day (Figure 1). Overall, 7.1% of patients had an event (5.4% were readmitted, 1.7% died). Compared to Wednesday (the reference day for the analysis), Friday discharges were significantly more likely to have an event with an increased adjusted relative risk of 4%. Patients who were discharged on days with more discharges appeared to have a greater risk of death or readmission (Figure 1).

Figure 1 Risk of 30-Day Mortality or Hospital Readmission by Day of Hospital Discharge.



This figure presents the proportion of discharges (bars, left vertical axis) for each day of the week (horizontal axis). The hazard ratio (HR) of 30-day death or urgent hospital readmission (diamonds, right vertical axis) with 95% confidence intervals is relative to Wednesday. The HRs are independent of patient factors (including age, sex, co-morbidities and previous hospitalization) and hospitalization factors (including length of stay, presence of a complication or procedure and teaching status of the hospital), but not the volume of discharges on that day.

These observations are interesting for a number of reasons. The pattern of adjusted outcome risk by day is very similar to that for discharge volume. This suggests the possibility that bad outcomes result when physicians and nurses forget important details when they are busy. Friday discharges might also be less stable when discharged. The actual reason for worse outcomes for these patients remains to be determined in further research.

We do not recommend that patients not be discharged on Fridays because the absolute difference in poor outcomes between Friday discharges and those on other days is relatively small. However, like many broad-based quality improvement indicators, the study findings do provide a "flag" indicating that closer examination of Friday discharge practices may be beneficial. At the same time, patient factors (including age, multiple illnesses, and previous hospital utilization) and hospitalization factors (such as length of stay, complications during the hospitalization, and medical vs. surgical admissions) should also be considered as these play a significant role in predicting patient outcomes. By examining these contributing factors and adjusting discharge practices accordingly, it may be possible to proactively address some of the negative outcomes.

Additionally, we do hope that this study stimulates an increase in the investigation of outcomes for patients discharged from hospital. While many studies have examined predictors of rehospitalization, there is a dearth of studies that determine why patients have other bad outcomes after leaving the hospital. With the systematic identification of factors that predict poor post-discharge results, we will be able to design, test and implement interventions that will improve patient care.

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Drs. van Walraven and Bell both contributed to the conception, design, analysis, interpretation of data, drafted and/or revised the manuscript, and gave final approval of the version to be published.

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