

Effect of Outpatient Visits and Discharge Destination on Potentially Preventable Readmissions for Congestive Heart Failure and Bacterial Pneumonia

Marilyn G. Klug, PhD, and Kyle Muus, PhD, Upper Midwest Rural Health Research Center

Key Findings

- Outpatient visits significantly reduced PPR risk for both congestive heart failure (CHF) and bacterial pneumonia in this population ($p < .01$).
- Patients who had an outpatient visit within 30 days of their discharge reduced their risk of potentially preventable readmission by 27% to 31%.
- Patients from isolated rural areas had the biggest PPR risk reduction (30% for pneumonia and 31% for CHF).
- Only about two-fifths of all patients had evidence of an outpatient visit within 30 days of discharge. Rural and urban patients had substantially the same outpatient visit rates.
- Discharge destination influenced PPR rates: Patients discharged to skilled nursing facility (SNF) and swing beds had the highest PPR rates, even after adjusting for severity.

Background

Potentially preventable readmissions (PPRs) are costly in human and economic terms. PPRs add costs to an already costly disease and potentially contribute to increased anxiety, stress, and depression for patients and their families. Health care spending associated with PPRs has been estimated at \$12 billion–\$17.4 billion per year (MedPAC, 2007; Jencks, Williams, & Coleman, 2009).

Hospital readmissions may indicate one or a combination of factors: poor in-hospital care, insufficient discharge planning, uncoordinated transition care, and/or inadequate follow-up care (Marcantonio et al., 1999; McAlister et al., 2001; Hunt et al., 2002; MedPAC, 2007).

Three quarters of readmissions among Medicare patients may be preventable (MedPAC, 2007). A national

30-day Medicare hospital readmission rate of 17.6% was reported in 2007, using 2005 data; 76% of these readmissions were identified as potentially preventable (MedPAC, 2007).

Successful efforts to reduce preventable readmissions require a clearer understanding of factors that may increase or decrease PPRs. Timely outpatient follow-up care and the destination of the discharged patient have both been suggested as possible factors that could affect potentially preventable readmissions.

Purpose and Approach

This study explored the relationship between PPRs and (a) use of outpatient follow-up care, (b) discharge destination, (c) rural versus urban residence of the patient, and (d) time to follow-up care. These factors were examined in a large population of Medicare patients with a hospital stay for one of these prevalent diagnoses: congestive heart failure and bacterial pneumonia.

CHF is the most common diagnosis among hospitalized Medicare patients (CMS, 2008) and is associated with six-month hospital readmission rates of more than 40% (Krumholz et al., 1997). Bacterial pneumonia has a significant health and economic impact on U.S. residents (American Lung Association, 2007). In 2003, approximately 65,000 people died of pneumonia in the United States (Hoyert, Kung, & Smith, 2005). In 2007, there were approximately 166,000 CHF patients and 267,000 pneumonia patients who sought and received care in U.S. rural hospitals (Stranges et al., 2010).

This study included a total of 1,013,725 pneumonia patients and 1,079,511 CHF patients nationwide. One-third (33%) of the pneumonia patients and 27% of the CHF patients were from rural areas. Medicare Provider Analysis and Review (MedPAR) and outpatient data for years 2006–2007 were analyzed via 3M Potentially Preventable Readmission (PPR) software to exclude readmissions for reasons unrelated to patients' initial admissions.

All outpatient visits (i.e., visits to physicians, physician assistants, clinical social workers, nurse practitioners, independent clinical laboratories, ambulance providers, or free-standing ambulatory surgical centers) from outpatient and carrier files were matched to this sample.

Rates of readmission within 30 days of initial hospitalization were calculated and adjusted for illness demographics, severity, type of initial hospital (urban and rural Prospective Payment System [PPS], and critical access), and residential rurality of patient, using logistic regression. Differences in readmission risk associated with outpatient visits and discharge destinations were also calculated.

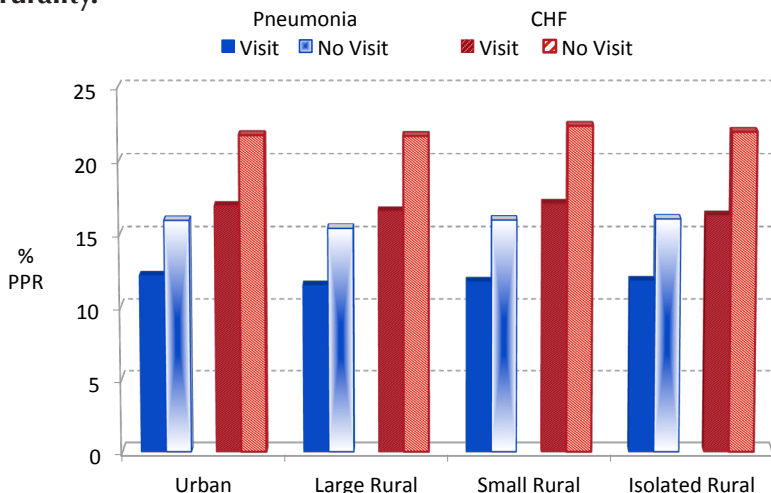
Results

Outpatient Visits

When adjusting for demographics and severity, outpatient visits greatly reduced the risk of PPR in pneumonia and CHF patients (Figure 1).

There was a four to five percentage point increase in prevalence of PPR for patients who had no visit within 30 days of discharge ($p < .01$).

Figure 1. Adjusted prevalence of PPR in patients with bacterial pneumonia and CHF for outpatient visit by rurality.



Patients who had an outpatient visit within 30 days of discharge had a consistent 27% to 31% decreased risk of PPR.

- Strong association was held across both pneumonia and CHF and in urban and rural patients.
- Urban patients with either disease had a decreased PPR risk of approximately 27% (0.729 odds ratio for pneumonia patients and 0.734 odds ratio for urban CHF patients).

Patients living in isolated rural areas had the largest reduced risk of PPR if they had an outpatient visit within 30 days.

- Pneumonia patients from small and isolated rural areas who had outpatient visits had decreased PPR rates of 30%.
- CHF patients from large rural areas who had outpatient visits had a decreased PPR rate of 28%, a 31% reduced PPR rate for CHF patients from isolated rural areas.

About two fifths of patients—rural or urban—receive follow-up outpatient care within 30 days of discharge.

- Forty-two percent of all pneumonia patients received outpatient care within 30 days, 43% for all CHF patients.
- Rural and urban patients had approximately the same outpatient visit rates.

Discharge Destination

Rural patients have different discharge destination patterns than urban patients. PPR rates varied by discharge destination.

- Patients in urban areas had more discharges to home health (CHF: 21% vs. 16%; pneumonia: 16% vs. 11%) and skilled nursing facilities (CHF: 17% vs. 14%; pneumonia: 24% vs. 18%). Patients in small and isolated rural areas had more discharges to swing beds (CHF: 5% vs. 1%; pneumonia: 8% vs. 2%) and routine/home (CHF: 61% vs. 56%; pneumonia: 57% vs. 52%).
- The patient’s discharge destination was strongly associated with PPR: routine (home) discharges had the lowest PPR prevalence (11% pneumonia, 17% CHF), while skilled nursing facilities and swing beds had the highest PPR rates (pneumonia 15%, CHF 17%), even when adjusting for severity.

PPR rates varied by rurality and discharge destination combinations.

- Urban pneumonia and CHF patients discharged to skilled nursing facilities had the highest severity-adjusted PPR rates (17% pneumonia and 23% CHF) compared to rural pneumonia and CHF patients (15% and 20%).
- Rural patients discharged to home health had slightly higher PPR rates compared to urban patients, especially for CHF patients (17% pneumonia, 23% CHF in rural areas; 16% and 21% in urban areas, although many patients for whom home health care was ordered did not receive it within the 30-day, post-discharge period).
- PPR rates for patients discharged to swing beds was consistently higher than routine discharges by 2% to 3%, though varied across rurality for both diseases.

Discharge destination was also associated with time to outpatient visits.

- Using an ANCOVA model, urban patients had outpatient visits sooner than rural patients when adjusting for severity (pneumonia: urban = 5.3 days, rural = 6.0 days, $p < .001$; CHF: urban = 4.9, rural = 5.6, $p < .001$). (Figure 2).

Figure 2. Days to outpatient visit for patients with pneumonia and CHF by residential rurality.

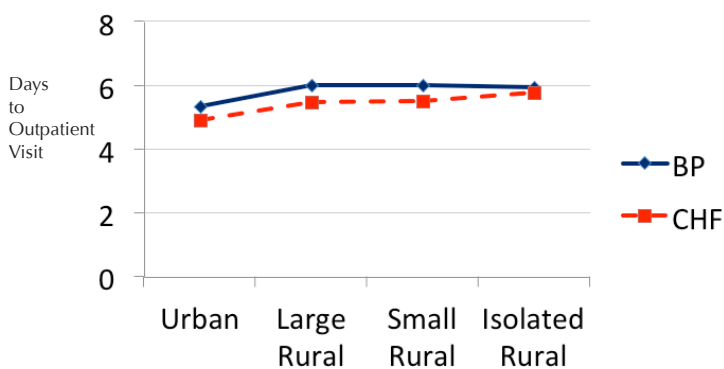
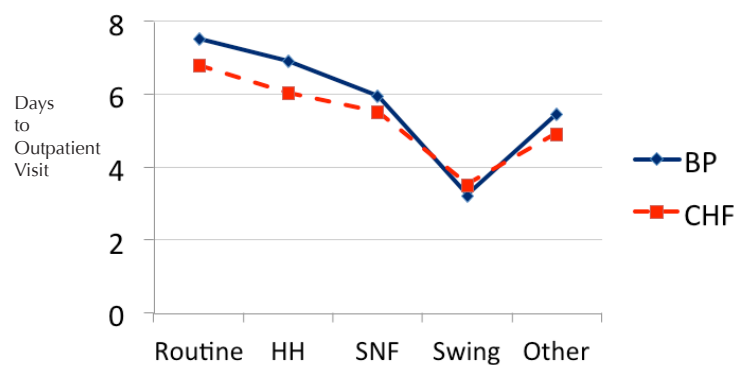


Figure 3. Days to outpatient visit for patients with pneumonia and CHF by discharge destination.



- The adjusted days until visit for the five discharge destinations were all significantly different from each other (pneumonia: routine = 7.5, home health = 6.9, SNF = 6.0, swing bed = 6.2, other = 5.5, $p < .001$; CHF: routine = 6.8, home health = 6.1, SNF = 5.5, swing bed = 3.5, other = 4.9, $p < .001$). (Figure 3).

Policy Implications

These findings emphasize the importance of receiving timely post-discharge outpatient care and appropriate discharge destination for reducing preventable readmissions, especially but not exclusively among rural-based patients. A greater decrease in PPRs for small and isolated rural patients, relative to large rural and urban, is likely due to patients from small and isolated rural areas having higher PPR rates, and thus have more to gain from outpatient visits.

Outpatient follow-up appears to be strongly influential in reducing PPRs—and too many patients don't have outpatient follow-up, regardless of residence. Timely post-discharge follow-up care can promote positive health outcomes for the patient by allowing health care providers to address any emerging health exacerbations, promote compliance with home care instructions, and adjust (as needed) medication regimens and dosages.

Given that fewer than half of the patients in the study had evidence of any kind of outpatient follow-up within 30 days, policy action to encourage appropriate post-discharge follow-up care could have a major impact in improved patient health and reduced PPRs. Any such action should ensure that rural residents have accessible options for follow-up care.

Additional research is needed to determine if alternatives to outpatient care such as telehealth interventions (e.g., telephone contacts with providers to monitor patients' blood pressure and weight) decrease PPR rates, particularly for rural patients. Additional research could also develop an evidence base to identify which types of outpatient interventions are most effective in decreasing PPRs.

Home health care appeared to have less of an effect on reducing PPRs in rural areas relative to urban areas. Also, many rural patients were discharged to home health but had not received one visit within 30 days of discharge. Though funding may be available for home health care in rural areas, implementation of that care in remote regions can be difficult. Further work needs to be done to find ways to assist rural home health care workers in effectively and efficiently providing care to remote patients.

Despite relatively low patient severity and timely outpatient visits, swing bed destination was associated with higher PPR risk, especially for pneumonia patients. Consequently, the relationship of swing bed discharges and readmission rates warrants further investigation, especially in light of the large increase in the number of critical access hospitals in recent years (Race et al., 2011; Reiter & Freeman, 2011) and the importance of swing beds as a post-acute care option in rural areas (especially those areas without SNFs).

References

- American Lung Association. (2007). *Pneumonia fact sheet*. New York: Author. Retrieved from <http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=35692>.
- Centers for Medicare and Medicaid Services. (2008). *Medicare ranking for all short-stay hospitals by discharges fiscal year 2005 versus 2004*. Baltimore, MD: Author.
- Hoyert, D. L., Kung, H., & Smith, B. L. (2005). *Deaths: preliminary data for 2003*. *National Vital Statistics Reports*, 53(15). Hyattsville, MD: National Center for Health Statistics.
- Hunt, S. A., Baker, D. W., Chin, M., Cinquegrani, M. P., Feldman, A. F., Francis, G. S., . . . Smith, S. C. (2002). ACC/AHA guidelines for the evaluation and management of chronic heart failure in the adult. *Journal of Heart and Lung Transplantation*, 21, 189–203.
- Jencks, S. F., Williams, M. V., & Coleman, E. A. (2009). Rehospitalizations among patients in the Medicare Fee-for-Service Program. *New England Journal of Medicine*, 360, 1418–1428.
- Krumholz, H. M., Parent, E. M., Tu, N., Vaccarino, V., Wang, Y., Radford, M. J., & Hennen, J. (1997). Readmission after hospitalization for congestive heart failure among Medicare beneficiaries. *Archives of Internal Medicine*, 157(1), 99–104.
- Marcantonio, E. R., McKean, S., Goldfinger, M., Kleefield, S., Yurkofsky, M., & Brennan, T. A. (1999) Factors associated with unplanned hospital readmission among patients 65 years of age and older in a Medicare managed care plan. *American Journal of Medicine*, 107(1), 13–17.
- McAlister, F. A., Lawson, F. M., Teo, K. K., & Armstrong, P. W. (2001). A systematic review of randomized trials of disease management programs in heart failure. *American Journal of Medicine*, 110(5), 378–384.
- MedPAC. (2007). Report to Congress: *Promoting greater efficiency in Medicare*. Washington, DC: Author.
- Race, M., Gale, J., & Coburn, A. (2011, March). *Provision of long term care services by critical access hospitals: Are things changing?* Portland, ME: Maine Rural Health Research Center, University of Southern Maine.
- Reiter, K. L., & Freeman V. A. (2011). *Trends in skilled nursing facility and swing bed use in rural areas following the Medicare Modernization Act of 2003*. Chapel Hill, NC: North Carolina Rural Health Research & Policy Analysis Center Cecil G. Sheps Center for Health Services Research.

EFFECT OF OUTPATIENT VISITS AND DISCHARGE DESTINATION ON POTENTIALLY PREVENTABLE READMISSIONS FOR CONGESTIVE HEART FAILURE AND BACTERIAL PNEUMONIA

Stranges, E., Holmquist, L., & Andrews, R. M. (2010, January). *Inpatient stays in rural hospitals, 2007*. Rockville, MD: Agency for Healthcare Research and Quality.

Additional Information

The information in this policy brief is based on Upper Midwest Rural Health Research Center Final Report #14 by Marilyn G. Klug, PhD, and Kyle Muus, PhD.

Support for this Policy Brief was provided by the Office of Rural Health Policy, Health Resources and Services Administration, PHS Grant No. 5U1CRH03717-02-00.

For more information, contact: Marilyn Klug, marilyn.klug@med.und.edu.