



# Inpatient-outpatient Transitions for Patients with Resident Primary Care Physicians: Access and Readmission

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## ABSTRACT

**BACKGROUND:** Transition from hospitalization to postdischarge care is a vulnerable period for patients. How the experience of this transition differs for patients with resident primary care physicians is unknown.

**METHODS:** In a single, large academic primary care practice, we examined an inception cohort of consecutive hospitalizations and postdischarge visits of hospitalized patients with resident or faculty primary care physicians between 2008 and 2013. We compared patient demographics, readmission risk, and access to outpatient care between resident and faculty primary care physicians by using generalized estimating equations to account for repeated hospitalizations.

**RESULTS:** We documented 8161 hospitalizations among patients with resident primary care physicians and 20,844 hospitalizations among patients with faculty primary care physicians. Hospitalized patients with resident primary care physicians were generally younger, more likely to be on Medicaid, and more likely to be African American ( $P < .001$ ). Patients with resident primary care physicians were less likely to be seen within 7 and 30 days of discharge (adjusted relative risk, 0.83; 95% confidence interval [CI], 0.81-0.93 at 7 days; adjusted relative risk, 0.88; 95% CI, 0.85-0.92 at 30 days) and had an increased risk of readmission within 30 days (adjusted odds ratio, 1.25; 95% CI, 1.13-1.37). They also were considerably less likely to see their own provider at first follow-up (relative risk, 0.55; 95% CI, 0.52-0.59).

**CONCLUSIONS:** Hospitalized patients with resident primary care physicians had lower rates of timely postdischarge follow-up, higher rates of readmission, and a lower likelihood of seeing their own provider than did patients with faculty primary care physicians. These findings highlight the challenges facing academic centers for patients with resident primary care physicians.

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**KEYWORDS:** Ambulatory care; Hospital readmission; Internship and residency

Although academic centers increasingly focus on care transitions, postdischarge adverse events, and preventable readmissions,<sup>1,2</sup> surprisingly little understanding exists about the differences between resident and faculty primary care

physicians and how primary care physician type affects postdischarge access and risk of readmission.<sup>3,4</sup>

Resident physicians serve as primary care physicians for large fractions of patients in academic primary care practices, and continuity clinic is a required and expanding component of internal medicine residency. In 2009, the Accreditation Council for Graduate Medical Education increased its ambulatory care requirement to expand exposure to primary care.<sup>5</sup> Despite this change, the inpatient requirements of many internal medicine residency programs interfere with a cohesive longitudinal care experience for providers and patients.<sup>6</sup>

Resident practices typically differ from those of faculty members. Resident clinics tend to care for more socially disadvantaged populations with a higher disease burden and

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less social support.<sup>6,7</sup> Previous studies have shown mixed effects of resident primary care on the overall quality of and satisfaction with care.<sup>7-11</sup> Adding to the challenges with access, resident patients more frequently miss appointments.<sup>12</sup> Because access to primary care affects ambulatory-sensitive conditions, and thus initial hospital admissions, and subsequent posthospitalization care for patients, the characteristics of a resident primary care practice may be particularly poorly suited to the complex needs of patients after hospitalization.<sup>13</sup>

We know of no studies to date that have examined the associations of primary care physician type on posthospitalization access to postdischarge primary care or on risk of hospital readmission. To address these questions, we examined 29,000 consecutive hospitalizations of patients in our academic practice, more than 8000 of which occurred among patients with resident primary care physicians.

## METHODS

Beth Israel Deaconess Medical Center (BIDMC) is a 618-bed academic medical center in Boston, Massachusetts. Healthcare Associates is the large primary care practice located at the medical center.<sup>14</sup> The practice includes approximately 60 faculty members and 110 residents and cares for 41,000 patients, accounting for 100,000 patient visits annually. It is an integrated primary care practice, geographically located in 2 suites within a single building.

### Beth Israel Deaconess Medical Center Medicine Residency Program

The Internal Medicine Residency Program at the BIDMC includes approximately 150 residents. For the continuity clinic experience, most residents practice at Healthcare Associates. Others practice at other affiliated sites or are preliminary residents, thus reducing the number of residents who practice at Healthcare Associates to 110. By the time of their senior year, a resident panel size is approximately 100 to 120 patients.

First-year residents have weekly continuity clinic with the exception of a few inpatient rotations. Second- and third-year residents had weekly clinics until July 2009, when the yearly schedule was restructured. Since 2009, second- and third-year residents rotate in 3-week blocks, alternating between an inpatient rotation and an outpatient rotation. During inpatient blocks, the residents have no continuity clinics. The structure of the outpatient blocks includes 2 weeks of an elective rotation with weekly continuity clinic and 1 week with daily afternoon sessions of continuity clinic.

Nearly all faculty and all residents admit patients to the Division of General Medicine & Primary Care hospitalist service. At discharge, a hospital-based administrative service schedules follow-up appointments using a standardized algorithm. Patients are preferentially scheduled with their primary care doctor if available. If a primary care physician appointment is not available in the requested time, patients with resident primary care physicians are scheduled with another resident supervised by a common preceptor and then with a faculty physician if no resident appointment is available. Patients with faculty primary care doctors are scheduled with another faculty member if their own primary care physician is not available and then with a resident supervised by the faculty member.

## CLINICAL SIGNIFICANCE

- Patients with resident primary care doctors had less timely postdischarge primary care access at both 7 and 30 days in a large academic practice.
- Patients with resident primary care doctors had 20% to 25% higher odds of 30-day readmission than those with faculty primary care doctors.
- The higher readmission rate among resident patients is important for academic medical centers because they are more likely to be penalized under the readmission penalty program through the Center for Medicare Services.

## Covariates and Outcomes

We used standard administrative data to extract patient demographic characteristics, including age, sex, and race/ethnicity, which we coded as white, black, Hispanic, Asian, and other. We used ZIP code of

residence to estimate proximity to BIDMC; we assigned indicator variables for each of the 10 most common ZIP codes and an additional category for all others. Insurance status was categorized as private insurance, Medicaid/free care, Medicare, and other, including self-insurance, worker's compensation, and others. Language was classified as English or other. We used the index admission before each posthospitalization visit to ascertain discharge location (home, home with services, nursing facility), length of stay, number of discharge medications, number of hospitalizations in the prior year, and discharging service (medicine or other). We imputed case-mix index for patients for whom we did not have the case mix index, using length of stay, number of annual hospitalizations, discharge from the medical service, sex, and age. We included both standard inpatient and observation-level discharges.

To assess the accuracy of primary care physician designation in our administrative data, we examined the medical records from a random sample of 50 hospitalizations from the larger cohort. Among these hospitalizations, 94% of patients attributed to attending primary care physicians had a true attending primary care physician at Healthcare Associates, and 93% of patients attributed to resident primary care physicians had a resident primary care physician.

## Statistical Analysis

We evaluated the Healthcare Associates resident practice in several ways. First, we described the demographic characteristics of the discharge patients with resident primary care

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