



Hospitalizations for ambulatory care sensitive conditions across primary care models in Ontario, Canada



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ABSTRACT

The study analyzes the relationship between the risk of a hospitalization for an ambulatory care sensitive condition (ACSC), and the primary care payment and the organizational model used by the patient (fee-for-service, enhanced fee-for-service, blended capitation, blended capitation with interdisciplinary teams). The study used linked patient-level health administrative databases and census data housed at the Institute for Clinical Evaluative Sciences in Ontario. Since the province provides universal health care, the data capture all patients in Ontario, Canada's most populous province, with about 13 million inhabitants. All Ontario patients diagnosed with an ACSC prior to April 1, 2012, who had at least one visit with a physician between April 1, 2012, and March 31, 2013, were included in the study ($n = 1,710,310$). Each patient was assigned to the primary care model of his/her physician. The different models were categorized as Fee-for-Service (FFS), enhanced-FFS, blended capitation, and interdisciplinary team. A logistic regression was used to model the risk of having an ACSC hospitalization during the one-year observation period. Adjustments were made for patient characteristics (age, sex, health status, and socio-economic status) and for the geographic location of the practice. Using patients belonging to FFS models as the reference group, the risk of an ACSC hospitalization was higher for patients belonging to the blended-capitation model using interdisciplinary teams (Adjusted Odds Ratio [AOR] = 1.06, 95% confidence interval [CI] = 1.00–1.12) and lower for enhanced-FFS (AOR = 0.78, CI = 0.74–0.82) and blended capitation patients (AOR = 0.91, CI = 0.86–0.96). Using patients with hypertension as the reference group, the odds of an ACSC hospitalization were much higher for patients with any other ACSC and increased with patients' morbidity. The risk was lower for patients of higher socio-economic status (AOR = 0.63, CI = 0.60–0.67) in the highest neighborhood income quintile.

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1. Introduction

Hospitalizations due to ambulatory care sensitive conditions (ACSCs) are considered potentially preventable because they are related to conditions that should not require hospitalizations, if

they are appropriately treated and managed in a primary care setting (Billings et al., 1993; Bindman et al., 2008; Brown et al., 2001; Caminal et al., 2004; Chen et al., 2009; Laditka et al., 2005). Recent systematic reviews examined the literature on ACSC hospitalizations, and the findings support the validity of a hospitalization rate as an indicator of the quality of primary care as long as adequate adjustment is made for variation in patient characteristics (Eggle et al., 2014; Rosano et al., 2013a).

The rate of ACSC hospitalizations has been used as an indicator of both access to and effectiveness of primary care. The rate is also used as a measure of the effectiveness of new policies aimed at

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strengthening the primary care sector (Brown et al., 2001; Burgdorf, 2014; Ibanez-Beroiz et al., 2014; Nedel et al., 2008; Rubinstein et al., 2014; Sundmacher and Kopetsch, 2015). In cross-country comparisons, ACSC hospitalization rates were lower in the health systems with a stronger primary care sector (as opposed to a hospital-centric health care system) and in systems where the primary care physicians had a more important role, including as a gatekeeper to specialist services (Rosano et al., 2013a,b). In the United States, a higher rate of ACSC hospitalizations was observed in regions with a lower supply of primary care physicians (Laditka et al., 2005) and amongst people facing financial barriers, such as people with no health care insurance who have to pay out-of-pocket for primary care visits (Billings et al., 1993). Similar results were found in countries with universal health care insurance: visits to the emergency department and admissions for ACSCs were found to be higher for low-income people (Huntley et al., 2014; Roos et al., 2005), despite their higher utilization of primary care services (Roos et al., 2005).

Both primary care practice models and physician remuneration are considered important determinants of patient access to care for ACSCs. For example, in the United States, the patient-centered medical home model has been associated with lower ACSC hospitalization rates (Yoon et al., 2013). Aside from the practice characteristics, physician payment alone may provide different incentives for appropriate care management of patients with ACSCs. Fee-for-Service (FFS) remuneration has been criticized for incentivizing short visits that might not be sufficient to appropriately care for complex chronic conditions, however FFS does incentivize additional visits by the same physician. The FFS payment method has generally been associated with an overprovision of care (Brosig-Koch et al., 2015; Gosden et al., 2000). In contrast, capitation payment does not penalize physicians for having longer patient visits but does incentivize referrals to other care providers as opposed to additional visits with the same primary care physician (Liddy et al., 2014).

The literature on ACSC hospitalizations is limited in relation to specific characteristics at the practice level that could affect the quality of primary care delivery, in terms of the method of payments to primary care physicians and in terms of organizational characteristics of the primary care practice, such as whether the practice provides interdisciplinary care to address the diverse health needs of patients. In addition, most studies have only examined ACSCs at the population level, measuring rates in specific population groups or in comparing regions. To our knowledge, this is the first study to look at how a primary care model may affect the likelihood of an ACSC hospitalization for a patient, in a context of universal health insurance for physician and hospital services.

The Canadian province of Ontario offers an important opportunity to examine the relationship between physician remuneration and practice model and patient ACSC hospitalizations in the context of universal health insurance for physician and hospital services. Ontario has actively reformed primary care payment starting in 2004 and has evolved to have a variety of common payment and practice models for primary care.

Patients can choose to see any physician. Physicians in Ontario can decide the model they wish to practice in and can be identified according to their payment models (FFS, enhanced-FFS, and blended capitation). The enhanced-FFS and blended capitation mechanisms are based on patients being enrolled with their physician. Enrolment is optional on both the physician's and the patient's sides but not available for FFS physicians. Physicians are paid on a FFS basis for seeing patients who are not enrolled with them. In 2010, 26% of Ontarians were not enrolled with a physician (i.e. their physician was paid on a FFS basis for the care), 33% were

enrolled with a physician in enhanced-FFS, 35% were enrolled with a physician in a blended capitation payment model and the remaining 5% were patients of other unique models of primary care (Glazier et al., 2012).

Enhanced-FFS is a model that mixes FFS with additional payments for enrolled patients for the provision of specific services which are related mostly to prevention and disease management. The enhanced-FFS model has been associated with better continuity of care compared with the pure FFS model (Kralj and Kantarevic, 2012). Ontario has implemented blended-capitation that provides additional payments for a list of specific services, such as chronic disease management. Because capitation rates in Ontario are only age and sex adjusted, patients enrolled are likely to be healthier and to require minimum care (Glazier et al., 2012; Rudoler et al., 2015b). It is possible that the payment incentives in the blended capitation model may lead to the provision of less patient care than is necessary and to a greater likelihood of an ACSC hospitalization compared to those in FFS models, all else being equal. On the other hand, the incentives for providing chronic disease management and requirements for after-hours care to improve access (Haggerty et al., 2008) could counter balance that effect.

Physicians working in a blended-capitation model were able to form interdisciplinary teams called Family Health Teams (FHTs) which offer multiple theoretical advantages, such as patient education in managing their condition and a higher quality of care (Lin et al., 2004; Russell et al., 2009; Sommers et al., 2000). FHTs are considered to adhere to the seven principles of the patient-centered medical home (PCMH) model, i.e., a personal physician, physician-directed medical practice, whole-person orientation, coordination and integration of care, quality and safety, enhanced access, and payment reflective of the value for patients (Rosser et al., 2011). Given the empirical evidence about better quality of care in an interdisciplinary team setting, one may expect to find lower odds of ACSC hospitalizations for patients in FHTs, as compared to patients in FFS.

Physicians have no incentives to avoid ACSC hospitalizations for their patients under any of the models.

2. Methods

The study period is April 1, 2012, to March 31, 2013, which was the most recent fiscal year for which the data was available at the time of the analysis. We adopted the Canadian Institute for Health Information (CIHI, 2012) definition of ACSC hospitalizations as those related to seven chronic conditions: angina, asthma, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), diabetes, grand mal status and other epileptic convulsions,¹ and hypertension. The study population consisted of all Ontarians aged 18 to 74 previously diagnosed with these conditions. An ACSC diagnosis was defined by at least two physician billings or one acute hospital admission record with one of the seven conditions mentioned above between April 1, 2010 and March 31, 2012, i.e. in the 24-month period prior to the year under study. This is the method used in Ontario to determine the prevalence and the incidence of chronic diseases (Hux and Tang, 2003). Individuals who died during the study period were excluded.

2.1. Data sources and variables

This study was conducted at the Institute for Clinical Evaluative

¹ Hereafter referred to as epilepsy for the sake of simplicity.

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