ORIGINAL RESEARCH

Same-Day Discharge After Elective Percutaneous Coronary Interventions in Ontario, Canada

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***Background*—**To manage overcrowding and bed shortages in Canadian hospitals, same-day discharge (SDD) after percutaneous coronary intervention (PCI) has emerged as a solution to improve resource utilization. However, limited information exists regarding current trends, hospital variation, and safety of SDD PCI in Canada.

***Methods and Results*—**We evaluated outpatients undergoing elective PCI in Ontario, Canada, from October 2008 to March 2016. SDD was defined when patients were discharged on the day of PCI, and non-SDD was defined as those patients who had 1 overnight stay. The primary outcome was 30-day all-cause death or hospitalization for acute coronary syndrome. Inverse probability of treatment weighting with propensity score was used to account for differences in baseline and clinical characteristics between SDD and non-SDD groups. Among 35 972 patients who underwent elective PCI at 17 PCI centers in Ontario, 10 801 patients (30%) had SDD PCI and 25 121 patients (70%) had non-SDD PCI. Substantial hospital variation for SDD PCI was observed, ranging from 0% to 87% during the study period. In the propensity-weighted cohort, SDD patients had no significant difference in 30-day rates of death or hospitalization for acute coronary syndrome (1.3% versus 1.6%; hazard ratio: 0.84 [95% CI, 0.65–1.08]; P=0.17) compared with non-SDD patients. SDD and non-SDD patients also had no significant difference in 30-day rates of mortality or coronary revascularization.

***Conclusions*—**In this large population-based cohort of elective PCI patients, we demonstrated the safety of SDD PCI. Increased adoption of this strategy could lead to improved bed-flow efficiency and substantial savings for the Canadian healthcare system without comprising outcomes. **(*J Am Heart Assoc*. 2019;8:e012131. DOI: 10.1161/JAHA.119.012131.)**

Key Words: discharge • healthcare costs • hospital stay • percutaneous coronary intervention • variation

Percutaneous coronary intervention (PCI) is the most commonly performed invasive cardiac procedure worldwide. It is estimated that >50 000 patients undergo PCI to treat coronary artery disease each year in Canada.[1] Discharging patients on the same day after PCI, also known as *same-day discharge* (SDD) PCI, has gained in popularity in many countries.[2–6] This practice was enabled by advances in stent technology and adjunctive pharmacology and increased use of radial access during PCI procedures, reducing periprocedural myocardial infarction (MI) and vascular access-site complications. Proponents of SDD PCI argue that this practice could shorten hospital length of stay, reduce healthcare costs, and improve patient satisfaction.[6] In contrast, opponents have argued that the added pressure to discharge patients in a short time frame could limit time for recovery, reduce opportunity for patient education, and potentially increase risk of adverse outcomes.

In the Canadian healthcare system, where hospital bed capacity is limited and overcrowding of hospitals occurs commonly to meet the needs of an aging population, widespread adoption of SDD PCI could potentially lead to substantial savings of scarce healthcare resources. Although

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An accompanying Table S1 is available at https://www.ahajournals.org/doi/suppl/10.1161/JAHA.119.012131

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Clinical Perspective

What Is New?

- Same-day discharge after uncomplicated elective percutaneous coronary intervention is a reasonable patient-focused approach that has gained popularity in many parts of the world.
- In Ontario, Canada, we observed increasing utilization of same-day discharge after elective percutaneous coronary intervention over the past decade; however, substantial hospital variation was present.

What Are the Clinical Implications?

- Given the lack of safety concerns associated with this approach, we estimate that increased use of same-day discharge across Ontario would result in substantial reductions in the need for overnight stays in hospitals that are struggling with bed shortages and overcrowding.

several studies have shown that SDD PCI may be safe, they were conducted in highly selected patients at low risk of adverse events.[2–4] Recent reports from the US CathPCI registry among Medicare beneficiaries found low overall prevalence of SDD PCI (5.3%) in the study population.[7,8] SDD PCI has been widely adopted for the majority of PCI patients in some hospitals across Canada; however, whether SDD PCIs are being delivered safely, without compromising clinical outcomes, is unknown. Accordingly, the first objective of our study was to evaluate practice patterns of SDD PCI in Ontario, Canada. Second, we evaluated the safety of patients who were discharged on the same day after PCI, comparing them with patients who were discharged after an overnight stay.

Methods

The authors declare that all data and supporting materials have been provided with the published article. The data set from this study is held securely in coded form at ICES. Although data-sharing agreements prohibit ICES from making the data set publicly available, access may be granted to those who meet prespecified criteria for confidential access, available online (https://www.ices.on.ca/DAS).

Data Sources

Clinical data on all PCI procedures were obtained from the CorHealth Ontario Cardiac Registry, which has a mandate to collect data on all patients undergoing invasive cardiac procedures in Ontario. Coordinators at each of the 17 cardiac centers with PCI capability gathered data on demographics, clinical characteristics, procedural characteristics (including stent type and location), and relevant comorbid conditions. The cardiac registry was then linked to the various longitudinal administrative data sets using unique encoded identifiers and analyzed at ICES to protect patient confidentiality. Administrative data sources used in our study included the Canadian Institute for Health Information (CIHI) Discharge Abstract Database, the Same Day Surgery Database, and the National Ambulatory Care Reporting System to identify additional risk factors, comorbidities, emergency room assessments, and hospitalizations. The Registered Persons Database, which captures health insurance coverage of all Ontarians, was used to determine the vital status of patients.

Study Population

The study cohort included patients aged >18 years who had an elective outpatient (from home) PCI procedure in Ontario from October 1, 2008, to March 31, 2016 (Figure 1). Patients who had invalid health card numbers, who were not Ontario residents, or who had aborted PCI procedures were excluded. We also excluded patients for whom we were unable to link the cardiac registry to administrative records because of the inability to determine patient outcomes. For patients who had multiple PCI procedures during the study period, the first procedure was considered the index event for study inclusion. Because the intention was to study those patients who were eligible for SDD, patients who died during the hospitalization after PCI were excluded. We also excluded patients who had >1 overnight stay, because it likely reflected complications after PCI. The inclusion of such patients would have created a higher risk cohort of patients who had complications or comorbidities and thus, practically, would not have been eligible for SDD PCI.

Definitions

SDD PCI patients were defined as patients who were discharged home on the same day as the procedure. The comparison group was composed of non-SDD PCI patients who had an overnight stay and were discharged the following day.

Outcomes

The prespecified primary outcome of our study was a composite end point consisting of all-cause mortality and hospital readmission due to acute coronary syndrome (ACS) at 30 days after PCI. The diagnosis of ACS included MI and unstable angina, identified by *International Classification of Diseases, Tenth Revision (ICD-10)*, disease codes (I20, I21, I22, I23.82, I24) in the CIHI databases.[9] Secondary outcomes included the primary end point at 1 year and 30-day and 1-year all-cause mortality, all-cause hospitalization, and coronary revascularization.

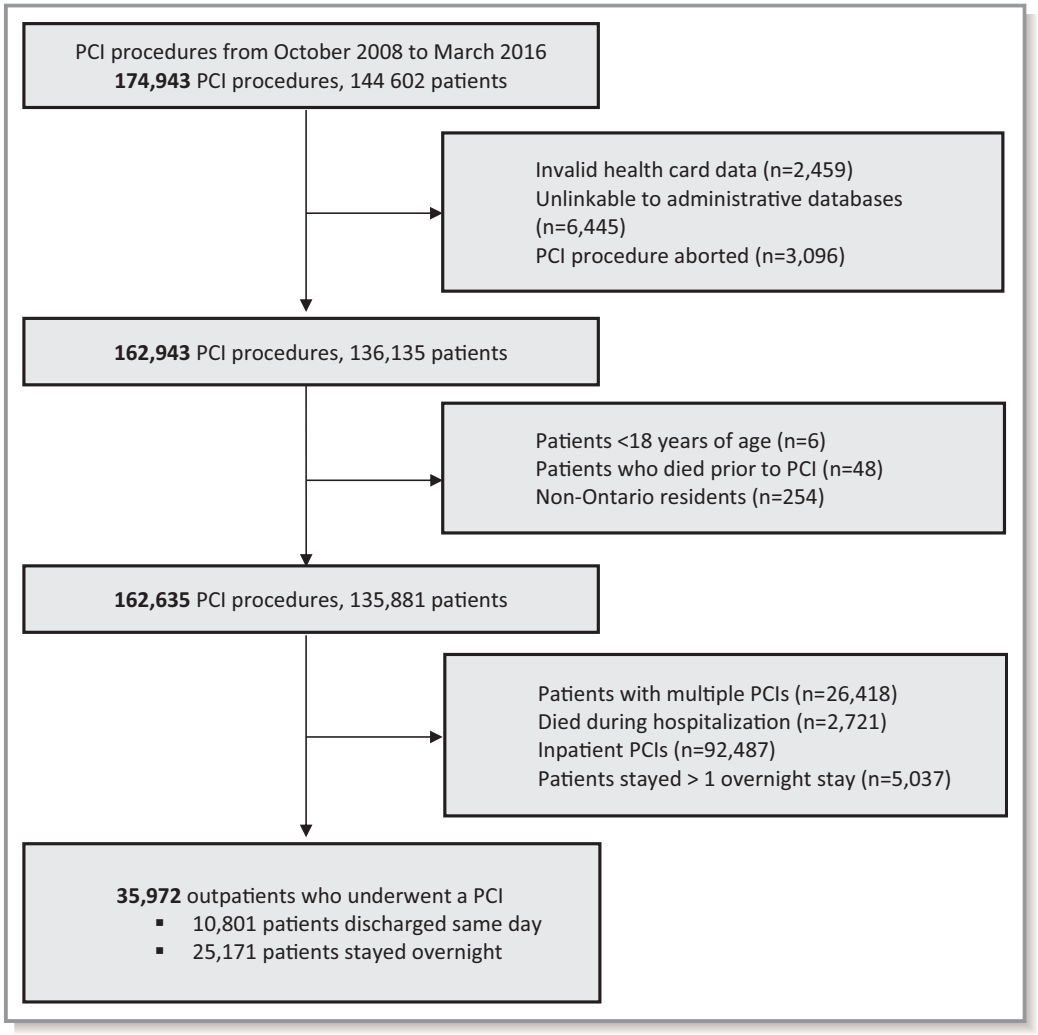

Figure 1. Cohort selection. PCI indicates percutaneous coronary intervention.

Statistical Analysis

We first examined temporal trends in the practice of SDD PCI by examining yearly utilization rates in Ontario during the study period. Linear regression was used to examine secular trends using the SDD PCI rate as the dependent variable and the calendar year of the procedure as the independent variable. Second, we examined potential hospital variation by calculating rates of SDD PCI at each Ontario PCI center.

In comparing the clinical outcomes of patients who had SDD and overnight stay, we assessed the demographic and clinical characteristics of these groups using the χ^2 test for categorical variables and the Wilcoxon rank-sum test for continuous variables. To adjust for potential confounding between the treatment groups, we used the inverse probability of treatment weighting with the propensity score to account for observed systematic differences in baseline covariates.[10–12] The propensity score was estimated with multiple logistic regression analysis including the following characteristics, which were selected on the basis of clinical knowledge: demographics (age, sex), clinical characteristics (Canadian Cardiovascular Society [CCS] angina classification, number of diseased vessels, left ventricular ejection fraction, stent type, serum creatinine), prior cardiac comorbidities (hypertension, diabetes mellitus, hyperlipidemia, smoking, MI, heart failure, coronary revascularization), medical comorbidities (chronic obstructive pulmonary disease, cerebrovascular disease, peripheral vascular disease), and the Charlson comorbidity index. We did not adjust for radial access and hospital characteristics because these factors were likely associated with SDD PCI.

Patients were then weighted by the inverse of the probability of receiving the treatment that they actually received. The balance of baseline covariates between the treatment groups in the weighted cohort was assessed by computing weighted standardized differences, with differences of <0.1 indicating good balance. The effect of SDD on the hazard of clinical outcomes was then estimated using a Cox proportional hazards model in which the hazard of the outcome was regressed on the overnight stay group as the

Table 1. Demographic and Clinical Characteristics of PCI Outpatients, After IPTW Adjustment*

Characteristic	Overnight Stay n=25 171	SDD n=10 801	Standard Difference
Demographics, %			
Age, y, mean	65.5	65.4	0.0127
Male sex	73.4	73.1	0.0081
Cardiac risk factors, %			
Diabetes mellitus	32.1	32.2	0.0028
Hypertension	70.3	70.1	0.0045
Hyperlipidemia	76.0	75.5	0.0103
Current smoker	19.4	19.1	0.0092
Prior comorbidities, %			
History of MI	22.3	22.6	0.0073
History of congestive heart failure	4.3	4.1	0.0080
Previous PCI	20.1	20.2	0.0009
Previous coronary artery bypass grafting	14.8	14.5	0.0069
Peripheral vascular disease	7.8	7.8	0.0014
History of cerebrovascular disease	5.9	6.1	0.0111
Chronic obstructive pulmonary disease	5.3	5.5	0.0077
Renal disease	3.3	3.3	0.0014
Dialysis	1.5	1.5	0.0013
Charlson comobidity index, mean	0.71	0.73	0.0137
Clinical and procedure characteristics, %			
CCS class			
0	12.8	13.2	0.0099
1	13.3	13.6	0.0068
2	36.8	36.2	0.0106
3	25.9	25.4	0.0125
4	2.5	2.6	0.0045
LVEF			
20–34%	3.1	3.1	0.0026
35–49%	10.4	10.5	0.0059
<20%	0.6	0.7	0.0109
≥50%	53.7	54.7	0.0215
Creatinine, mmol/L			
0–120	75.7	75.9	0.0051
121–180	6.0	5.8	0.0069
≥181	1.9	2.0	0.0073
Missing	16.4	16.3	0.0042
PCI group			
Same-sitting PCI	59.1	58.0	0.0208
Scheduled PCI	40.5	41.5	0.0209
Staged PCI	0.4	0.4	0.0009
Number of diseased vessels			
2	17.0	16.7	0.0081
3	7.8	7.7	0.0039
Drug-eluting stent	65.2	64.4	0.0162
Radial access site	37.5	56.4	0.3842

CCS indicates Canadian Cardiovascular Society; IPTW, inverse probability of treatment weighted; LVEF, left ventricular ejection fraction; MI, myocardial infarction; PCI, percutaneous coronary intervention; SDD same-day discharge.
*A weighted propensity model was used to compare groups, which included the following variables: age (continuous), sex, CCS class, PCI type, LVEF, creatinine, diabetes mellitus, hypertension, hyperlipidemia, smoking, chronic obstructive pulmonary disease, MI, congestive heart failure, cerebrovascular disease, peripheral vascular disease, previous PCI, previous coronary artery bypass grafting, Charlson comobidity index, number of diseased vessels, stent type.

reference. The inverse probability treatment weights were incorporated, and a robust variance estimator was used.

The use of data in this project was authorized under section 45 of Ontario's Personal Health Information Protection Act, which does not require review by a research ethics board. SAS v9.3 (SAS Institute) was used to conduct statistical analyses. A 2-sided *P* value of <0.05 was considered statistically significant.

Results

Creation of the Study Cohort

From October 1, 2008, to March 31, 2016, a total of 35 972 patients underwent an elective outpatient PCI procedure at 17 PCI centers in Ontario (Figure 1). Of these patients, 10 801 (30%) were discharged home on the same day after PCI (SDD) and 25 121 patients (70%) stayed in the hospital overnight (non-SDD).

Baseline Characteristics and Procedural Characteristics

Before propensity matching, the 2 study groups differed such that the SDD group had more current smokers, more CCS class 2 angina, less prior MI or bypass surgery, more same-sitting (ad hoc) PCI, more drug-eluting stent use, and more radial access compared with the non-SDD group (Table S1). After propensity weighting analysis was performed, the

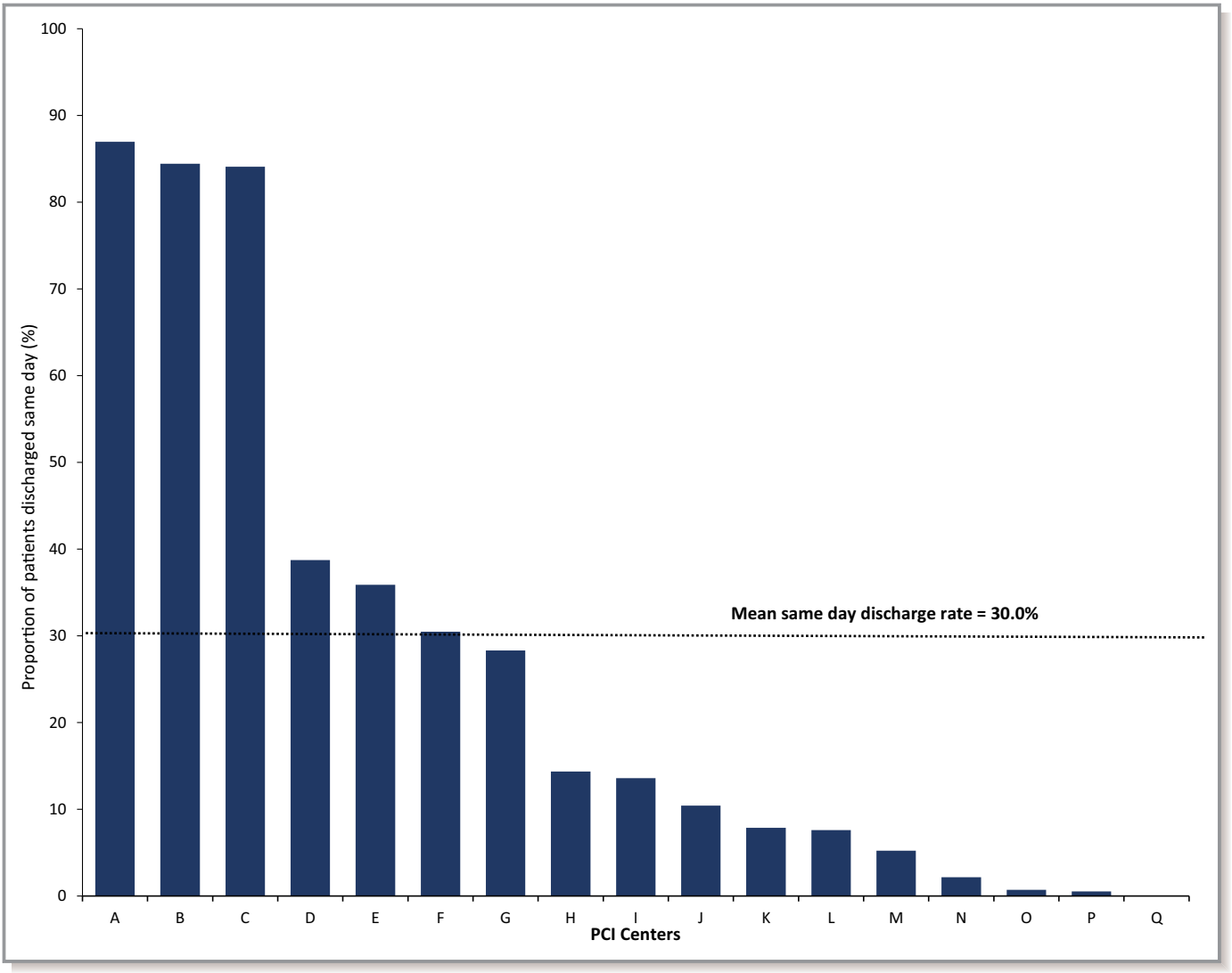

Figure 2. Overall hospital variation in outpatient same-day procedures, 2008–2015. PCI indicates percutaneous coronary intervention.

differences between groups were not significant except for the use of the radial access site, which was higher for the SDD group (56.4%, versus 37.5% in the non-SDD group; standard difference: 0.38; Table 1). Among the SDD cohort, the mean age was 65 years, and 73.1% were male. Overall, 32.2% of patients in this cohort had diabetes mellitus, and 20.2% had previous PCI; most SDD patients had normal renal function. The majority of patients were considered CCS class 2 at the time of the procedure, and most had normal left ventricular function. Ad hoc or same-sitting PCI was performed in 58% of cases, and 64.4% of patients received a drug-eluting stent.

Regional Variation and Temporal Trends

During the study period, the average rate of SDD in Ontario was 30% (Figure 2). We noted considerable variability across the 17 Ontario PCI centers in their use of SDD, ranging from 0% to 87%. SDD was used increasingly over the past decade in Ontario, with overall rates of 17% in 2008 and rates as high as 45% by 2015 (Figure 3). SDD rates were significantly higher at academic centers (university-affiliated teaching hospitals; 40.1% versus 10.7%), at PCI centers with onsite cardiac surgery (34.9% versus 9.4%), and at centers with >50% radial access use (42.8% versus 25.9%). Seven of 17 centers had an SDD PCI rate of 0% to 10%; these hospitals were a mixture of rural and urban centers, had a range of radial access usage from 15% to 51%, and comprised both low- and high-volume PCI centers.

Clinical Outcomes

There was no significant difference between the groups for the primary end point at 30 days (1.3% SDD versus 1.6% non-SDD; hazard ratio [HR]: 0.84 [95% CI, 0.65–1.08]; *P*=0.17; Table 2). Mortality at 30 days was slightly lower

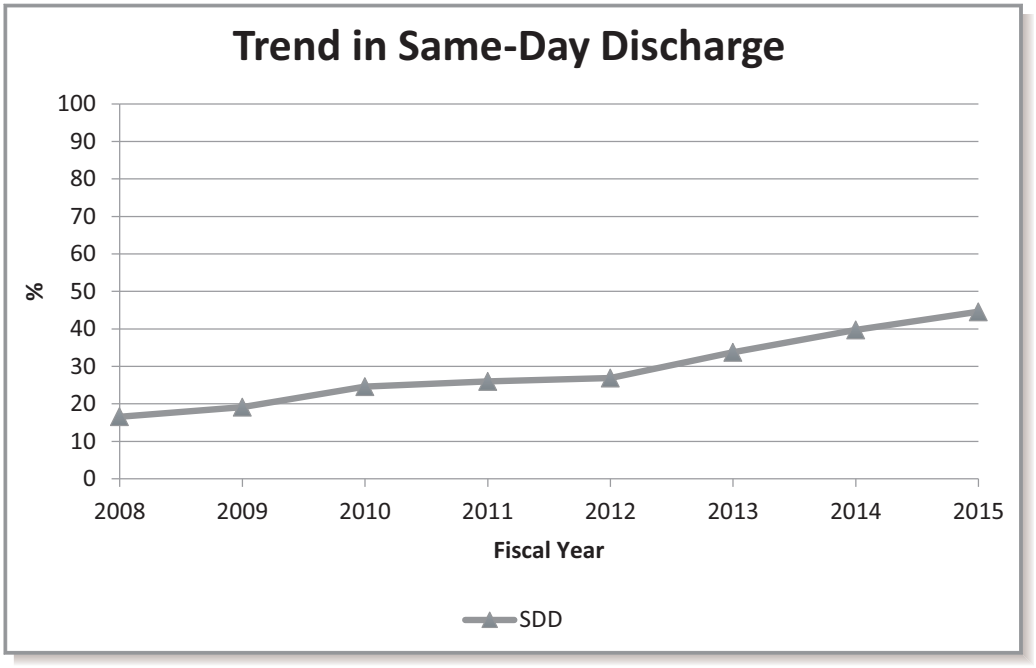

Figure 3. Trend in same-day discharge (SDD) in Ontario, 2008–2015.

among the SDD group (0.1% versus 0.2%; HR: 0.40 [95% CI, 0.19–0.84]; *P*=0.016). The 30-day rates of coronary revascularization and hospitalization for ACS were similar among the 2 groups. There was a trend of lower 30-day all-cause hospitalization among the SDD patients (5.8% versus 6.4%; *P*=0.056). At 1 year, the rate of death or ACS hospitalization was lower among the SDD patients compared with patients who stayed overnight (6.5% versus 7.6%; HR: 0.85 [95% CI, 0.76–0.96]; *P*=0.0059), driven by a lower 1-year rate of hospitalization for ACS among the SDD patients (4.7% versus 5.9%; HR: 0.79 [95% CI, 0.69–0.91]; *P*=0.0009). The 1-year rates of mortality and coronary revascularization were similar among the 2 groups. The 1-year all-cause hospitalization rate was significantly lower among the SDD group (22.8% versus 24.8%; HR: 0.90 [95% CI, 0.85–0.95]; *P*=0.0002).

Discussion

Our large population-based study of patients undergoing elective outpatient PCI offers new insights on the population use of SDD PCI across Ontario during the past decade and the safety of SDD procedures. First, we found substantial hospital variation in the use of SDD PCI across Ontario, whereas some hospitals had not adopted this practice and some hospitals were discharging 4 of 5 elective cases each day. Second, in contrast to the concerns regarding the safety of SDD PCI, we found that clinical outcomes of SDD patients were not significantly different than those of patients who had an overnight stay. We estimate that if Ontario hospitals could adopt an SDD rate of 80% for elective PCI, it could save 3500 overnight stays in Ontario alone.

One of the most remarkable findings of our study is that despite PCI care being regionalized to only 17 centers in Ontario, the practice of SDD PCI varies dramatically. We were unable to fully understand the reasons for this variation, but these differences were unlikely to be related to patient characteristics because patients from each center are quite similar with respect to baseline demographics and clinical characteristics.[13] Instead, we observed variation in SDD PCI rates for factors that included radial access and hospital characteristics. Such observations show that the practice of PCI was highly dependent on the hospital culture and the ability to embrace changes in clinical practice. Those physicians who believe in the safety of SDD PCI tend to discharge patients early after PCI, whereas those who remain concerned regarding the safety of SDD PCI continue to admit their patients overnight. It is likely that most Ontario centers using an SDD strategy have either formal or informal criteria for selecting patients who could be discharged home safely after elective PCI; however, it would appear that physicians practicing SDD PCI were able to correctly select patients for this strategy based on the low event rates we observed. Not surprisingly, we found higher rates of radial access among the Ontario SDD patients compared with those who stayed overnight; a successful radial PCI may have been a criterion in support of SDD at many centers. Several recent papers reporting on the US PCI experience highlight the importance of transradial interventions in reducing length of stay, thus facilitating SDD, and reducing health care costs overall.[5,6,8]

Table 2. Outpatient PCI Clinical Event Rates, After IPTW Adjustment*

Outcome (%)†	Overnight Stay n=25 171	SDD n=10 801	HR (95% CI)	*P* Value
Death or ACS hospitalization				
30 d	1.6	1.3	0.84 (0.65–1.08)	0.1684
1 y	7.6	6.5	0.85 (0.76–0.96)	0.0059
Death				
30 d	0.2	0.1	0.40 (0.19–0.84)	0.0158
1 y	1.9	1.9	1.00 (0.83–1.21)	0.9775
Hospitalization for ACS				
30 d	1.4	1.3	0.91 (0.70–1.19)	0.5078
1 y	5.9	4.7	0.79 (0.69–0.91)	0.0009
All-cause hospitalization				
30 d	6.4	5.8	0.90 (0.80–1.00)	0.0562
1 y	24.8	22.8	0.90 (0.85–0.95)	0.0002
Revascularization				
30 d	3.5	3.4	0.97 (0.85–1.11)	0.6954
1 y	11	10.3	0.93 (0.86–1.01)	0.0801

ACS indicates acute coronary syndrome; HR, hazard ratio; IPTW, inverse probability of treatment weighted; PCI, percutaneous coronary intervention; SDD, same-day discharge.
*A weighted propensity model was used to compare event rates among the 2 groups, which included the following variables: age (continuous), sex, Canadian Cardiovascular Society class, PCI type, left ventricular ejection fraction, creatinine, diabetes mellitus, hypertension, hyperlipidemia, smoking, chronic obstructive pulmonary disease, myocardial infarction, congestive heart failure, cerebrovascular disease, peripheral vascular disease, previous PCI, previous coronary artery bypass grafting, Charlson comobidity index, number of diseased vessels, stent type.
†Time counted from episode discharge date.

At low-uptake centers there may be concern among operators regarding the possibility of adverse clinical outcomes soon after discharge with an SDD approach. Our study confirmed that the practice of SDD PCI is safe through 30 days, with no differences observed in the incidence of death, ACS hospitalization, all-cause hospitalization, or need for further coronary revascularization between the SDD and non-SDD groups. In fact, at 1 year, rehospitalization and ACS hospitalizations were lower in the SDD PCI group compared with the non-SDD PCI patients, with no difference in mortality or revascularizations. This likely reflects that physicians correctly selected the SDD PCI cohort to be a low-risk group that was expected to have low rates of adverse events at 30 days and 1 year. Although some baseline differences exist among the 2 groups, the use of inverse probability of treatment weighting methodology adjusts for these differences, permitting a balanced comparison of the groups. We also excluded patients who had >1 overnight stay in hospital after PCI, as these patients may have sustained complications related to the procedure, making them ineligible for consideration of SDD.

Our findings mirror the existing literature on SDD PCI. Meta-analyses of the literature, involving both observational and randomized data, compared SDD with non-SDD PCI in 12 803 patients in 37 studies[14] and 111 830 patients in 13 studies.[15–17] These studies involve highly selected patients, and there is considerable heterogeneity across published studies. The randomized trials reported no difference between SDD and overnight observation with regard to the 30-day combined incidence of death, MI, or target lesion revascularization or major bleeding and vascular complications. In the observational studies, 30-day death, MI, or TLR (target lesion revascularization) occurred at a rate of 1% (95% CI, 0.58–1.68%), and major bleeding and vascular complications occurred at a pooled rate of 0.68% (95% CI, 0.35–1.32). This pooled literature was underpowered to detect small differences between treatment groups in the randomized patients; however, both observational and randomized data would support consideration of programs for SDD among carefully selected patients.

Until recently, the overall uptake of SDD in the United States was quite low (1.25%).[7] A 2009–2012 report from the NCDR (National Cardiovascular Database Registry) CathPCI Registry and the Premier Healthcare cohort from 2006 to 2015 reported rates of SDD PCI of 5.3% and 3.5%, respectively, with SDD PCI rates as high as 6.3% in 2015 and rising to 22% in the past quarter of 2017.[18,19] In 2018, SDD PCI was endorsed by the Society for Cardiovascular Angiography and Interventions as a safe and reasonable approach for certain PCI patients at 4 to 6 hours after the completion of elective PCI or for PCI for non–ST-segment–elevation MI, provided certain criteria are met that favor the stable patient, a successful procedure, adequate hemostasis of the access site, and strong social supports to follow through with post-PCI instructions for care.[6] Such endorsements by our professional societies should encourage nonadopters to adopt best practices, given the safety demonstrated with this approach.

Economic Impact

In the Canadian healthcare context, the increasing popularity of SDD stems from the potential to reduce length-of-stay cost, increase hospital efficiency, and potentially improve patient satisfaction. Furthermore, SDD potentially opens up beds for other inpatient admissions in hospitals operating at near maximal capacity. In 2010, Rinfret et al reported that SDD after transradial PCI could save 1141 Canadian dollars per PCI, and recently Amin et al showed that each SDD saved 5128 US dollars per procedure, driven by reduced supply and room and board costs.[18,19] Currently in Ontario, we estimate that ≈10 000 PCI procedures are performed annually for elective indications.[20] We found that an SDD PCI in Ontario costs roughly 1200 Canadian dollars less that non-SDD PCI. Although the ideal rate of SDD PCI is unknown, if we could

increase the SDD rate from the 2015 rate of 45% to the 80% level observed at the highest centers, we would be able to save 3500 overnight stays each year, resulting in cost savings of 4.2 million Canadian dollars per year in Ontario alone. We also expect that the cost savings would be greater if this practice were adopted across Canada. For Canadian hospitals operating at maximal capacity, the biggest impact of SDD may lie in the reduction of overnight stays, more so than any projected cost savings, allowing for greater bed-flow efficiency.

Limitations

Several limitations of our study merit consideration. First, observational studies are subject to the influence of confounding, and our comparison of patient outcomes in SDD versus non-SDD PCI may have selection biases. However, our study differs from a typical comparative effectiveness analysis in that our main goal was to demonstrate the safety of SDD PCI, and patients selected for SDD should be at lower risk. The observation that SDD patients had no difference in clinical outcomes at 30 days and had lower rates of clinical outcomes was reassuring and suggests that patients were selected appropriately for discharge. We also repeated our analysis after adjusting for radial access in the inverse probability of treatment weighting method and found the results to be unchanged. Second, we did not take into account the variation of protocols and safety measures that might be in place for SDD PCI patients. For SDD PCI to be adopted more broadly, it would be prudent to have a systematic approach to create best practices and safety checklists to help determine SDD eligibility. Third, the availability of social supports, socioeconomic status, and distance lived from a PCI facility were not reported in prior studies, nor did we have access to such information for our study. Although this may explain some of the hospital variation we observed, particularly in rural settings, we noted that the centers with low or no uptake of SDD were evenly spread across urban, suburban, and rural parts of Ontario. Finally, we assessed the safety of SDD PCI for patients undergoing elective procedures. Future studies are needed to evaluate the safety and feasibility of same-day transfer or discharge of PCI patients with more acute indications.

Conclusions

The use of SDD after PCI across Ontario has been growing over the past decade; however, considerable center-to-center variability is still present. Given the safety of SDD PCI, important healthcare savings coupled with a substantial decline in the need for overnight stays may be realized by further increases in the rate of SDD after PCI in Ontario.

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Disclosures

None.

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SUPPLEMENTAL MATERIAL

Table S1. Demographic and clinical characteristics of PCI outpatients, before IPTW adjustment.

Characteristic	Overnight Stay N=25,171	Discharged Same Day N=10,801
Demographics (%)		
Age, mean ± SD	65.7±10.9	65.1±10.5
Men	72.7	75.3
Cardiac Risk Factors (%)		
Diabetes	32.2	31.3
Hypertension	70.9	68.6
Hyperlipidemia	76.0	75.7
Current Smoker	18.2	22.9
Prior Comorbidities (%)		
History of myocardial infarction	24.2	17.2
History of congestive heart failure	4.3	4.3
Previous percutaneous coronary intervention	20.2	19.7
Previous coronary artery bypass graft	15.7	12.1
Peripheral vascular disease	7.8	7.4
History of cerebrovascular disease	6.0	5.6
Chronic obstructive pulmonary disease	5.3	5.4
Renal Disease	3.4	2.8
Dialysis	1.5	1.2
Charlson Index, mean	0.74	0.63
Clinical and Procedure Characteristics (%)		
Canadian Cardiovascular Society Class		
0	13.0	11.9

1	13.4	13.1
2	35.0	41.1
3	25.5	27.4
4	2.6	2.3
Left Ventricular Ejection Fraction		
20% - 34%	3.4	2.4
35% - 49%	11.2	8.1
<20%	0.7	0.4
>=50%	54.9	48.2
Creatinine (mmol/L)		
0-120	80.6	62.6
121-180	6.7	4.4
181+	2.1	1.4
Missing	10.7	31.6
PCI Group		
Same Sitting PCI	54.1	71.8
Scheduled PCI	45.5	27.7
Staged PCI	0.4	0.5
Number of Diseased Vessels		
2	15.9	20.1
3	7.4	9.1
Drug-eluting stent	62.7	71.9
Radial access site	37.6	56.7

IPTW, inverse probability of treatment weighted; SD, standard deviation; PCI, percutaneous coronary intervention.