Cardiovascular Medication Use and Long-Term Outcomes of First Nations and Non–First Nations Patients Following Diagnostic Angiography: A Retrospective Cohort Study

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Background—In Canada, First Nations (FN) people are at greater risk of mortality than the general population following index angiography. This disparity has not been investigated while considering guideline-recommended cardiovascular medication use.

Methods and Results—Retrospective analysis of administrative health data investigated patterns of medication dispensation during the first year after index angiography among patients in Manitoba, Canada. Medication possession ratios (MPRs) reflecting the percentage of days in which medications were supplied were calculated separately for β-blockers, angiotensin-converting enzyme inhibitors, statins, and antiplatelets (clopidogrel). Patients were assigned to 1 of 4 categories: (1) not dispensed (0% MPR), (2) low (1–39% MPR), (3) intermediate (40–79% MPR), (4) high (≥80% MPR). Cox regression models that adjusted for MPR categories were used to explore the association between FN patients and both 5-year all-cause mortality and cardiovascular mortality. FN patients were less likely to have an intermediate MPR (odds ratio: 0.75; 95% CI, 0.57–0.99) or a high MPR (odds ratio: 0.64; 95% CI, 0.50–0.81) for statin medications than non-FN patients. FN patients also had higher adjusted risks of all-cause and cardiovascular mortality than non-FN patients (hazard ratio, all-cause: 1.54 [95% CI, 1.25–1.89]; cardiovascular: 1.62 [95% CI, 1.16–2.25]).

Conclusions—FN status was independently associated with intermediate and high MPRs for statins during the first year following index angiography among patients with known ischemic heart disease. Differences in MPR categories did not explain the disparity in all-cause and cardiovascular mortality between the 2 populations. Reduction of cardiovascular disparities may be best addressed using primary prevention strategies that include decolonizing policies and practices. (J Am Heart Assoc. 2019;8:e012040. DOI: 10.1161/JAHA.119.012040.)

Key Words: angiography • disparities • medication adherence • outcomes research • population studies
Medication Use and Health Outcomes Postangiogram

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Clinical Perspective

What Is New?

- Differences exist in cardiovascular medication-dispensing patterns between First Nations (FN) and non-FN index angiography patients.
- FN index angiography patients experience worse long-term mortality and hospitalization outcomes than non-FN patients, even after controlling for medication-dispensation patterns.

What Are the Clinical Implications?

- This research demonstrates that the differences in cardiovascular medication-dispensation patterns following angiography explain some but not all of the mortality and health disparities between FN and non-FN patients.
- These findings may contribute to the growing understanding of the impact of colonization on FN peoples and their continuing experience as they navigate the healthcare system and access procedures such as angiography.

differences in the use of these medications between FN and non-FN patients have not been explored.

The aim of this study was to extend our understanding of cardiovascular disparities between FN and non-FN people by addressing 2 objectives: to compare (1) the dispensation of guideline-recommended cardiovascular medications between FN and non-FN IHD patients who underwent index angiography and (2) the long-term mortality and rehospitalization outcomes among FN and non-FN angiography patients while controlling for medication dispensation.

Methods

The data used for this study are owned by the data providers and are not available unless granted approval from the University of Manitoba Education and Nursing Research Ethics Board, the Manitoba Health Information Privacy Committee, and the Health Information Research Governance Committee of Nanaandawewigamig, the First Nations Health and Social Secretariat of Manitoba. The authors do not have any special access privileges that others would not have.

Setting

Manitoba is a centrally located Canadian province with a population of ≈1.3 million people. Almost 11% of the total population in Manitoba is status FN (people registered as FN under the Indian Act), one of the largest percentages of the Canadian provinces.22 Canada has a publicly funded healthcare system that ensures all residents are entitled to insured health services provided by hospitals, physicians, and specialists.23 The services covered may vary across each provincial and territorial program depending on which services are considered medically necessary. Pharmaceutical coverage also varies across provinces and territories, and Manitoba employs a pharmacare program based on income and the total cost of eligible prescription drugs.23 Although Manitoba’s healthcare program provides coverage for all residents of Manitoba, status FN people on reserve may also receive limited primary health, public health, and health promotion services through federal programs.24 In addition, status FN people on and off-reserve may be eligible for pharmacare benefits through the federal noninsured health benefits program.25

Data Sources

This retrospective cohort study was conducted using health administrative data files housed in the Manitoba Population Research Data Repository at the Manitoba Center for Health Policy (MCHP). Data files in the repository may be linked using scrambled identifiers to maintain patient confidentiality and to allow for long-term outcome assessment while controlling for multiple variables. Patient-level demographic information was retrieved from the Manitoba Health Insurance Registry. Hospital Abstract and Medical Claims data files were used to identify comorbidities, cardiac procedures, and hospitalizations. Medication use was assessed using the Drug Program Information Network (DPIN) data file, which contains medication and patient information for all prescribed medications dispensed to residents of Manitoba at community pharmacies regardless of payer. Data on mortality, including primary cause of death, were derived from the Vital Statistics Mortality Registry. Finally, the Indian Registry System data file, a national database maintained by Department of Indigenous Services Canada containing information on all status FN people in Canada, was used to identify FN patients because information is not recorded in administrative health data collected in Manitoba.

Cohort Definition

The study cohort was derived from all patients aged ≥18 years who underwent coronary angiography between April 1, 2000, and March 31, 2009, in Manitoba (Figure 1). Angiography procedures were identified in the Hospital Abstracts data file using the Canadian Classification of Health Interventions (CCI) procedure code 3.IP.10. In an attempt to capture new episodes of cardiac events, we excluded patients who had an AMI (other than those associated with the angiography admission), percutaneous coronary intervention (PCI), or coronary artery bypass grafting (CABG) in the year before
For patients with >1 angiogram during 2000–2001 to 2008–2009, the first angiogram was used as the index procedure. Among the index angiography patients, to accurately assess medication use over the same length of time for each patient, we excluded those who died during their hospitalization or within the first year following discharge. Those with incomplete or periods of missing health insurance coverage in Manitoba were also excluded. Last, among patients who did not have an AMI within 7 days before their angiogram, those who did not undergo revascularization in the year following angiography were also excluded because they represent a heterogeneous group of patients in which indication of medication prescription is not clear. Thus our study cohort included adult index angiography patients with known IHD defined as having experienced a recent AMI or having stable IHD with an indication for revascularization (n=15216). This cohort represented patients who were likely candidates for guideline-recommended secondary prevention medications and who shared a similar entry point into the cardiovascular care system.

**Outcomes**

The primary medication outcome was the dispensation of a medication over the first year following angiography from any of the 4 guideline-recommended cardiovascular drug classes: (1) β-blockers, (2) angiotensin-converting enzyme (ACE) inhibitors, (3) statins, and (4) antiplatelet medications. Dispensations were identified in the DPIN data file according to their World Health Organization’s Anatomical Therapeutic Classification (ATC) system code. Although all medications listed in the ATC system for β-blockers, ACE inhibitors, and statins were used for the study, the antiplatelet category was limited to clopidogrel because other common antiplatelets,
such as tricagrelor and prasugrel, were not yet available during the study period, and aspirin use is not fully captured in the DPIN data file. Adherence to prescription was defined using the medication possession ratio (MPR), determined by the number of days of medication supplied divided by 365 days. The number of days supplied indicated on the last prescription fill was truncated at 1 year if it provided medication beyond the first year following angiography. Medications within the same class were considered interchangeable. MPRs were calculated for each medication class separately and used to assign patients to 1 of 4 categories: (1) not dispensed (0% MPR); (2) low (1–39% MPR); (3) intermediate (40–79% MPR); and (4) high (≥80% MPR), consistent with previous studies.

The primary health outcomes were 5-year all-cause and cardiovascular-related mortality. Secondary health outcomes included 5-year subsequent hospitalizations for any cause, AMI, congestive heart failure (CHF), IHD, and stroke identified in the hospital abstracts using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and Tenth Revision, Canada (ICD-10-CA) codes (Table S1). The follow-up period for each outcome began 1 year after the index angiography date and ended 5 years later or March 31, 2016 (study termination date), whichever occurred first. The median follow-up time was 4.9 years for the FN and non-FN groups.

Covariates

Baseline characteristics measured at the time of angiography included age, sex, area of residence, area-level income, and level of comorbidity. Area of residence was based on the patient’s postal code and corresponding regional health authority. At the time of the study, there were 5 regional health authorities in Manitoba responsible for the administration and delivery of healthcare services within their geographic areas. Area-level income was defined using urban and rural income quintiles based on the patient’s postal code and census data. The level of comorbidity was estimated with the Charlson comorbidity index, a reliable and valid prognostic mortality measure that is based on a weighted score from 17 comorbidity categories. Each category comprises specific ICD-9 and ICD-10 diagnostic codes, which were identified in the hospital abstracts and medical claims data files for the 5-year period immediately before the index angiography. The frequency of patients in each comorbidity category is presented in Table S2.

A composite measure of revascularization procedures (PCI or CABG) and whether a patient had an AMI within the 7 days before angiography (ie, recent AMI), were also used as covariates in the health outcome models. Revascularization procedures in the first year following angiography, including those performed during the index hospitalization, were identified using ICD-9-CM (PCI: 36.01–36.03, 36.05–36.07; CABG: 36.10–36.19) and CCI (PCI: 1.IJ.50, 1.IJ.57; CABG: 1.IJ.76) diagnostic codes in the Hospital Abstracts data file. Last, an ordinal variable for each medication class (ie, 4 separate variables) was created and added to the health outcome models to control for medication use. Patients could have a value of 0 to 3 for each variable, reflecting the 4 MPR categories.

Statistical Analysis

Descriptive analyses were conducted to compare baseline characteristics and all other covariates between FN and non-FN patients, using χ² tests for categorical variables and t tests for continuous variables. Separate multinomial logistic regression models were used to examine the relationship between MPR categories and FN status for each medication class. Each model was adjusted for baseline characteristics and FN status. The odds of FN group being in each of the MPR categories compared with being in the not dispensed category were compared with those in the non-FN group and reported as odds ratios (ORs) with 95% CIs. Unadjusted and adjusted Cox proportional hazards models were used to test whether FN status was associated with each primary and secondary health outcome. The first adjusted model controlled for baseline characteristics, recent AMI, and the composite revascularization variable, whereas a second model added the MPR category variables for each medication class. Estimates are presented as hazard ratios (HR) and 95% CIs. Statistical significance for all tests was set at P<0.05. All analysis was done on the secure server at the MCHP, using SAS statistical analysis software (v9.4; SAS Institute).

Results

The study cohort consisted of 818 FN patients and 14 398 non-FN patients, and their baseline characteristics are shown in Table 1. FN patients were younger (56.6 versus 63.8 years; P<0.0001), less likely to be male (69.2% versus 72.6%; P<0.03), and more likely to have a higher Charlson comorbidity index (1.31 versus 0.79; P<0.0001), to reside in the Northern Regional Health Authority (38.4% versus 2.3%; P<0.0001), and to reside in areas with the lowest average household incomes (59% versus 16.9%; P<0.0001). Recent AMI was higher in the FN group (50.4% versus 40.5%; P<0.0001). Among those with a recent AMI, a lower proportion of FN patients underwent revascularization in the first year following angiography compared with non-FN patients (73.5% versus 76.9%; P<0.001; not shown). In the full cohort, PCI procedures were more frequently performed among non-FN than FN patients (54.0% versus 47.8%;
The proportions of FN and non-FN patients who were dispensed a medication from each of the classes separately are shown in Figure 2. Compared with the non-FN group, significantly higher proportions of FN patients were dispensed an ACE inhibitor (81.3% versus 74.8%; \( P<0.01 \)) and clopidogrel (77.5% versus 71.5%; \( P<0.001 \), and a lower proportion was dispensed a statin (84.8% versus 87.6%; \( P<0.05 \)).

To explore this result further, subgroup analyses revealed that the differences for ACE inhibitors and clopidogrel occurred mainly among patients who did not have an AMI and patients who underwent CABG, whereas the difference seen for statins occurred primarily among AMI patients (Figure S1).

Table 1. Baseline Characteristics of FN and Non-FN Index Angiography Patients

| Variable                        | FN (n=818) | Non-FN (n=14,398) | \( P \) Value |
|---------------------------------|------------|-------------------|---------------|
| Age, y, mean±SD                 |            |                   |               |
| Male sex                        |            |                   |               |
| RHA                             |            |                   |               |
| Southern                        |            |                   |               |
| Winnipeg                        |            |                   |               |
| Prairie Mountain                |            |                   |               |
| Interlake-Eastern               |            |                   |               |
| Northern                        |            |                   |               |
| Average household income quintiles |          |                   | \(<0.0001\)   |
| Rural                           |            |                   |               |
| 1 (lowest)                      |            |                   |               |
| 2                               |            |                   |               |
| 3                               |            |                   |               |
| 4                               |            |                   |               |
| 5 (highest)                     |            |                   |               |
| Urban                           |            |                   |               |
| 1 (lowest)                      |            |                   |               |
| 2                               |            |                   |               |
| 3                               |            |                   |               |
| 4                               |            |                   |               |
| 5 (highest)                     |            |                   |               |
| Charlson comorbidity index score, mean±SD | 1.31 | 1.58 | 0.79 | 1.17 | \(<0.0001\) |
| Stable IHD with indication for revascularization* | 406 | 49.6 | 8569 | 59.5 | \(<0.0001\) |
| Recent AMI†                     | 412        | 50.4              | 5829          | 40.5 | \(<0.0001\) |
| PCI‡                            | 391        | 47.8              | 7781          | 54.0 | \(<0.001\) |
| CABG‡                           | 340        | 41.6              | 5613          | 39.0 | 0.1413 |

AMI indicates acute myocardial infarction; CABG, coronary artery bypass grafting; FN, First Nations; IHD, ischemic heart disease; PCI, percutaneous coronary intervention; RHA, regional health authority; s, suppressed due to small cell size (less than or equal to 5).

*No AMI diagnosis within the 7 days before index angiography date.

†AMI diagnosis within the 7 days before index angiography date.

‡Procedure during index year.

Primary Outcomes

A significantly higher proportion of patients in the FN group died during the follow-up period compared with non-FN patients (17.2% versus 12.8%; \( P<0.0003 \); Table 3). However, the proportion of deaths attributed to cardiovascular causes

Figure 2. Percentage of patients dispensed a medication during the first year following index angiography. *Significant difference at \( P<0.05 \) level. ACE indicates angiotensin-converting enzyme; FN, First Nations.
was not statistically different between groups (6.2% versus 5.3%, \(P=0.2254\)). After adjusting for baseline characteristics, recent AMI, and revascularizations (Figure 4A), FN patients had higher risks of all-cause mortality (HR: 1.63; 95% CI, 1.32–2.00) and cardiovascular mortality (HR: 1.73; 95% CI, 1.25–2.41) compared with non-FN patients. Adding the MPR categories to the model attenuated the relationship between FN status and both mortality outcomes (Figure 4B); however, FN patients continued to have a statistically significant higher risk of all-cause mortality (HR: 1.54; 95% CI, 1.25–1.89) and cardiovascular mortality (HR: 1.62; 95% CI, 1.16–2.25).

### Secondary Outcomes

The proportions of FN patients hospitalized for any reason, for AMI, for congestive heart failure, or for IHD during the follow-up period were all higher compared with non-FN patients (\(P<0.0001\); Table 3). The hazards for each hospitalization outcome, except for stroke, were higher for the FN group in the first adjusted model (Figure 4A). The addition of the MPR categories to the model lowered the hazards slightly; however, FN patients were still 53%, 44%, 83%, and 53% more likely to be hospitalized for any reason, AMI, CHF, and IHD, respectively.

### Table 2. Distribution of FN and Non-FN Patients in Each MPR Category for Each Medication Class

| Variable            | \(\beta\)-Blockers | ACE Inhibitors | Statins | Clopidogrel |
|---------------------|--------------------|---------------|---------|-------------|
| Not dispensed       | 88                 | 153           | 124     | 184         |
| Low                 | 90                 | 84            | 83      | 159         |
| Intermediate        | 172                | 153           | 173     | 112         |
| High                | 468                | 428           | 438     | 363         |

MPR categories: not dispensed, 0%; low, 1–39%; intermediate, 40–79%; high, ≥80%. ACE indicates angiotensin-converting enzyme; FN, First Nations; MPR, medication possession ratio.

### Table 3. Comparison of Mortality and Subsequent Hospitalization Outcome Frequency Between FN and Non-FN Patients

|                | FN (n=818) | Non-FN (n=14,398) | \(P\) Value |
|----------------|------------|-------------------|-------------|
| Mortality      |            |                   |             |
| All-cause      | 141        | 1845              | 12.8        |
| Cardiovascular | 51         | 757               | 5.3         |
| Subsequent hospitalization | 544 | 7162 | 49.7 | <0.0001 |
| AMI            | 85         | 791               | 5.5         |
| CHF            | 84         | 683               | 4.7         |
| IHD            | 205        | 1869              | 13.0        |
| Stroke         | 27         | 495               | 3.4         |

AMI indicates acute myocardial infarction; CHF, congestive heart failure; FN, First Nations; IHD, ischemic heart disease.

DOI: 10.1161/JAHA.119.012040
The proportions of patients in our study cohort that were dispensed medications from the 4 classes studied were consistent with those reported among acute coronary syndrome patients in Canada. β-Blockers were the most common medication class dispensed following angiography, with ≈90% of patients in both the FN and non-FN groups receiving a medication from this class. Antiplatelet medications were the least common (71% of total cohort); however, as mentioned, the only antiplatelet agent included in the study was clopidogrel. Clopidogrel is recommended for those who are intolerant of or allergic to aspirin and is often used in combination with aspirin for acute coronary syndrome or PCI patients with stents. Despite previous research reporting that a lower proportion of FN patients compared with non-FN patients underwent PCI in the 5 years following angiography, more FN patients in the present study cohort were dispensed clopidogrel, which is counterintuitive to what might be expected. ACE inhibitors were also dispensed to a higher proportion of FN than non-FN patients; this finding may be driven by the higher prevalence of diabetes mellitus among FN people. Interestingly, a lower proportion of FN patients were dispensed statins, which are shown to lower the risk of cardiovascular complications among individuals with diabetes mellitus.

Figure 4. Adjusted hazard ratios for the 5-year mortality and hospitalization outcomes comparing the FN and non-FN groups. A, Model 1 adjusted for age, sex, regional health authority, income quintile, Charlson comorbidity index score, recent AMI, and revascularizations. B, Model 2 adjusted for age, sex, regional health authority, income quintile, Charlson comorbidity index score, recent AMI, revascularizations, and medication possession ratio categories. AMI indicates acute myocardial infarction; CHF, congestive heart failure; CV, cardiovascular; FN, First Nations; HR, hazard ratio; IHD, ischemic heart disease.

more likely than non-FN patients to experience a subsequent hospitalization for any cause, for AMI, for congestive heart failure, or for IHD, respectively (Figure 4B).

Discussion

In this study we explored patterns in the dispensation of guideline-recommended cardiovascular medications between FN and non-FN patients with known IHD and whether those patterns help explain disparities in other outcomes between groups. Although differences were noted in the distribution of FN and non-FN patients in the MPR categories, no consistent patterns emerged across 4 medication classes studied. After adjusting for baseline sociodemographic variables and comorbidities, the FN group was less likely to attain an intermediate or high MPR for statins compared with the non-FN group. Even after controlling for these differences, FN patients continued to demonstrate a higher risk of mortality and subsequent hospitalizations following index angiography.

The management of IHD often includes prescribing guideline-recommended medications, with the aim of preventing or delaying subsequent cardiovascular events and death. The proportions of patients in our study cohort that were dispensed medications from the 4 classes studied were consistent with those reported among acute coronary syndrome patients in Canada. β-Blockers were the most common medication class dispensed following angiography, with ≈90% of patients in both the FN and non-FN groups receiving a medication from this class. Antiplatelet medications were the least common (71% of total cohort); however, as mentioned, the only antiplatelet agent included in the study was clopidogrel. Clopidogrel is recommended for those who are intolerant of or allergic to aspirin and is often used in combination with aspirin for acute coronary syndrome or PCI patients with stents. Despite previous research reporting that a lower proportion of FN patients compared with non-FN patients underwent PCI in the 5 years following angiography, more FN patients in the present study cohort were dispensed clopidogrel, which is counterintuitive to what might be expected. ACE inhibitors were also dispensed to a higher proportion of FN than non-FN patients; this finding may be driven by the higher prevalence of diabetes mellitus among FN people. Interestingly, a lower proportion of FN patients were dispensed statins, which are shown to lower the risk of cardiovascular complications among individuals with diabetes mellitus.

Prescribing guideline-recommended medications is an indicator of good quality of care, but the clinical effectiveness of medications depends on patients actually taking the medications as prescribed. Previous studies have shown that using MPR to measure adherence have found that patients with ≥80% MPR are associated with lower risks of mortality and other adverse outcomes. Despite this evidence, consistent cardiovascular medication use in outpatient settings has indicated suboptimal adherence, where approximately a third of patients with IHD were nonadherent after 2 years. In our study cohort, 62%, 49%, 58%, and 43% of all patients had MRPs ≥80% over the first year after angiography for β-blockers, ACE inhibitors, statins, and clopidogrel, respectively, which may also be considered suboptimal. Compared with non-FN patients, there were higher proportions of FN patients with good adherence to ACE inhibitors and clopidogrel and lower proportions with good adherence to β-blockers and statins. The lower likelihoods of having an intermediate or high MPR for statins were still evident after controlling for age, sex, regional health authority, income, and comorbidity score, which may be driven by a higher proportion of FN patients who were not dispensed a statin. Medication prescribing and adherence is complex and involves various factors related to patients and their socioeconomic conditions, the complexity of the therapy regimen, and the healthcare system. For example, confusion may exist regarding prescription medication coverage, given that separate federal and provincial programs provide limited pharmacare benefits to Manitoba residents. Consequently, efforts are needed to improve good adherence for all IHD
patients in Manitoba; however, interventions to achieve this goal must consider that FN and non-FN patients may not have similar access to medications.

Our other objective was to compare mortality and subsequent hospitalizations following index angiography between FN and non-FN IHD patients, controlling for use of cardiovascular medication use. Cardiovascular health disparities between FN and non-FN people in Canada are well documented in the literature, including patients who have undergone coronary angiography. The results in the present study are consistent with these findings and extend our understanding by demonstrating that differences in the pattern of guideline-recommended medication use attenuate but do not completely explain these disparities. Schultz et al found that a lower proportion of FN angiography patients who had an AMI underwent PCI, whereas a higher proportion received CABG procedures compared with non-FN patients; however, controlling baseline characteristics did not indicate a significant difference between the groups. Furthermore, adjusting for revascularization procedures did not explain the mortality disparities between groups. Therefore, although cardiovascular treatment and secondary prevention (ie, revascularizations and/or medications) following angiography are similar between FN and non-FN patients, FN patients continue to experience worse cardiovascular outcomes. It is then reasonable to suggest that differences at the time of angiography, such as the prevalence of known cardiovascular risk factors, likely further explain the health gap between the populations, illustrating the importance of primary prevention. Too often the responsibility of primary prevention (ie, being physically active, maintaining a healthy body weight) falls on the individual while the structural barriers that impede prevention are ignored. For FN people, these barriers are rooted in the historical colonial policies and practices that have led to inequities in the social determinants of health and a disproportionate burden of cardiovascular disease.

In 2015 the Truth and Reconciliation Commission of Canada identified 94 Calls to Action for governments, educational and religious institutions, civil society groups, and all Canadians to work toward and facilitate reconciliation. This report provides a foundation for removing the structural barriers that impede prevention and treatment, illustrating the importance of primary prevention. Too often the responsibility of primary prevention (ie, being physically active, maintaining a healthy body weight) falls on the individual while the structural barriers that impede prevention are ignored. For FN people, these barriers are rooted in the historical colonial policies and practices that have led to inequities in the social determinants of health and a disproportionate burden of cardiovascular disease.

In conclusion, subtle differences exist in the pattern of cardiovascular medication dispensation between FN and non-FN patients with known IHD during the first year following index angiography. However, these differences were not able to completely explain the poorer outcomes among FN patients. Strategies are required to improve the proportion of all Manitoba patients consistently taking these medications as recommended. However, given differences in coverage and the way medications are accessed by FN and non-FN people, tailored approaches to improve medication adherence for both populations may be required. This approach may lead to better outcomes for all patients, but disparities in adverse health outcomes between populations would likely still exist without acknowledging and addressing the impact of colonization on the health of FN people. Importantly, reducing cardiovascular outcome disparities may best be addressed with primary prevention strategies because secondary prevention and treatment appear to be similar between populations once they become part of the cardiovascular care system.
Acknowledgments
We acknowledge the Manitoba Centre for Health Policy for use of data contained in the Manitoba Population Data Repository under Health Information Privacy Committee file no. 2014/2015-34. The results and conclusions are those of the authors, and no official endorsement by the Manitoba Centre for Health Policy, Manitoba Health Seniors and Active Living, or other data providers is intended or should be inferred. We acknowledge and thank the Nanaan-dawewigamig research team members for their review and comments on this article and acknowledge that First Nations Health and Social Secretariat of Manitoba Health Information Research Governance Committee approved this project in development and final stages in 2015. We gratefully acknowledge Rady Faculty of Health Sciences Elder Mary Wilson, Grandmother of the Four Directions, for her insights concerning this article and her involvement in the larger study.

Sources of Funding
This work was supported by the Canadian Institutes of Health Research (MOP-136904), funded through the Indigenous Peoples’ Health Institute.

Disclosures
None.

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Supplemental Material
| Outcome | Data File       | Classification System | Code   |
|---------|----------------|------------------------|--------|
| AMI     | Hospital Abstracts | ICD-9-CM               | 410    |
|         |                 | ICD-10-CA              | I21    |
| CHF     | Hospital Abstracts | ICD-9-CM               | 428    |
|         |                 | ICD-10-CA              | I50    |
| Stroke  | Hospital Abstracts | ICD-9-CM               | 430-438|
|         |                 | ICD-10-CA              | I60-I69|
| IHD     | Hospital Abstracts | ICD-9-CM               | 410-414|
|         |                 | ICD-10-CA              | I20-I22, I24, I25 |

AMI, acute myocardial infarction; CHF, congestive heart failure; IHD, ischemic heart disease.
Table S2. First Nation and non-First Nation prevalence of individual diagnostic comorbidities used in the Charlson comorbidity index.

| Characteristic                              | Patient characteristic at index admission, n (%)* | p-value    |
|-------------------------------------------|---------------------------------------------------|------------|
| Charlson Comorbidity Index Score, mean ± SD| First Nations n = 82 (10.0) Non-First Nations n = 746 (5.2) | <.000 1    |
| Myocardial Infarction                     | 73 (8.9)                                           | 0.002 2    |
| Congestive Heart Failure                  | 35 (4.3)                                           | 0.962 4    |
| Peripheral Vascular Disease               | 31 (3.8)                                           | 0.949 0    |
| Cerebrovascular Disease                   | 28 (3.4)                                           | 0.003 1    |
| Dementia                                  | 138 (17.0)                                         | 0.005 5    |
| Connective Tissue Disease                 | 21 (2.6)                                           | 0.000 4    |
| Peptic Ulcer Disease                      | 10 (1.2)                                           | 0.072 5    |
| Mild Liver Disease                        | 337 (41.2)                                         | <.000 1    |
| Diabetes without complications            | 59 (7.2)                                           | <.000 1    |
| Paraplegia and Hemiplegia                 | s s                                                | 0.177 1    |
| Renal Disease                             | 63 (7.7)                                           | <.000 1    |
| Cancer                                    | 23 (2.8)                                           | <.000 1    |
| Moderate or Severe Liver Disease          | s s                                                |            |
| Metastatic Carcinoma                      | 0 (0.0)                                            |            |
| HIV/AIDS                                  | s s s s                                            |            |

SD, standard deviation; s, suppressed due to small cell size (n ≤ 5).
*Unless otherwise indicated.
Table S3. Distribution of patients in each MPR category* who were dispensed a medication at least once in the first-year following angiography, by medication class.

| Variable         | First Nations | Non-First Nations | p-value |
|------------------|---------------|-------------------|---------|
|                  | N  | %      | N  | %      |         |
| Medication Classification |   |        |     |        |         |
| β-blockers       |    |        |     |        |         |
| Total dispensed  | 730 | 12.909 | 12,909 | 0.0033 |
| Low              | 90  | 12.3   | 1175  | 9.1    |
| Intermediate     | 172 | 23.6   | 2803  | 21.7   |
| High             | 468 | 64.1   | 8931  | 69.2   |
| ACE-inhibitors   |    |        |     |        |         |
| Total dispensed  | 665 | 10,774 | 0.4237 |
| Low              | 84  | 12.6   | 1468  | 13.6   |
| Intermediate     | 153 | 23.0   | 2265  | 21.0   |
| High             | 428 | 64.4   | 7041  | 65.4   |
| Statins          |    |        |     |        |         |
| Total dispensed  | 694 | 12,606 | 0.0894 |
| Low              | 83  | 12.0   | 1294  | 10.3   |
| Intermediate     | 173 | 24.9   | 2858  | 22.7   |
| High             | 438 | 63.1   | 8454  | 67.1   |
| Clopidogrel      |    |        |     |        |         |
| Total dispensed  | 634 | 10,301 | 0.0081 |
| Low              | 159 | 25.1   | 2778  | 27.0   |
| Intermediate     | 112 | 17.7   | 1374  | 13.3   |
| High             | 363 | 57.3   | 6149  | 59.7   |

MPR, medication possession ratio
* Low = 1-39% MPR; Intermediate = 40-79% MPR; High = ≥80% MPR.
Figure S1. Subgroup analysis of separate patient groups.
Percentage of patients who were dispensed a medication from each classification during index year.

* significant difference at p<0.05 level.

AMI, acute myocardial infarction; CABG, coronary artery bypass graft; FN, First Nations; PCI, percutaneous coronary intervention.