Prevalence and Impact of Acute Myocardial Infarction in Hospitalized Patients With Peripheral Artery Disease

Analysis for RCOP NIS Cardio3

Muhammad Saad

## Preamble:

* **Reference Papers:**
  + [Li et al. 2023](https://www.ahajournals.org/doi/10.1161/JAHA.122.028970)
  + [Olivier et al. 2019](https://jamanetwork.com/journals/jamacardiology/fullarticle/2716724)
* **Study Objective**: Assess the incidence and impact of acute myocardial infarction (AMI) on hospitalized patients with peripheral artery disease (PAD).
* **Data Source**: Cross-sectional analysis of the National Inpatient Sample (NIS) from 2018 to 2020.
* **Patient Selection**: Included all inpatient admissions with a primary diagnosis of peripheral artery disease, comparing those with and without a secondary diagnosis of acute myocardial infarction.
* **Peripheral Artery Disease Categories**:
  + PAD with AMI
  + PAD without AMI
* **Primary Outcomes**:
  + In-hospital all-cause mortality
  + Total hospital length of stay (days)
  + Total charge, inflation adjusted to 2020 ($)
* **Secondary Outcomes**:
  + Acute heart failure
  + Ischemic stroke
  + Transient ischemic attack
  + Acute kidney injury
  + Amputation
* **Statistical Analysis**: Multiple logistic and linear regression models to evaluate the independent association of AMI with in-hospital outcomes in patients with PAD, adjusting for:
  + Demographics: Age, sex, race, residential income, insurance, hospital region, hospital bedsize, hospital location, teaching status and admission type (elective or non-elective).
  + Medical History: Diabetes mellitus, previous heart failure, hypertension, obesity, chronic pulmonary disease, chronic kidney disease, atrial fibrillation, liver disease, cancer, anemia, coronary artery disease, dementia, smoking status, previous myocardial infarction, previous percutaneous coronary intervention (PCI), previous coronary artery bypass grafting (CABG), previous implantable cardioverter-defibrillator (ICD) insertion, previous pacemaker or cardiac resynchronization therapy (CRT) insertion, and previous stroke or TIA.
  + Comorbidities: Charlson comorbidity index.
* **Software:** All analyses were performed using R Version 4.4.1 (R Foundation for Statistical Computing, Vienna, Austria)

## Baseline Table:

| **Characteristic** | **Peripheral Artery Disease without Acute Myocardial Infarction** N = 586,360*1* | **Peripheral Artery Disease with Acute Myocardial Infarction** N = 10,835*1* | **p-value***2* | **Overall** N = 597,195*1* |
| --- | --- | --- | --- | --- |
| Age, y | 67 (13) | 70 (11) | <0.001 | 67 (13) |
| Sex |  |  | 0.19 |  |
| Female | 225,795 (39) | 4,325 (40) |  | 230,120 (39) |
| Male | 360,550 (61) | 6,510 (60) |  | 367,060 (61) |
| Race |  |  | <0.001 |  |
| White | 372,895 (65) | 7,085 (67) |  | 379,980 (65) |
| Asian or Pacific Islander | 8,685 (1.5) | 275 (2.6) |  | 8,960 (1.5) |
| Black | 110,020 (19) | 1,660 (16) |  | 111,680 (19) |
| Hispanic | 64,400 (11) | 1,190 (11) |  | 65,590 (11) |
| Native American | 4,855 (0.8) | 80 (0.8) |  | 4,935 (0.8) |
| Other | 13,695 (2.4) | 310 (2.9) |  | 14,005 (2.4) |
| Residential income |  |  | 0.60 |  |
| $1 - $51,999 | 207,420 (36) | 3,850 (36) |  | 211,270 (36) |
| $52,000 - $65,999 | 158,630 (28) | 2,810 (26) |  | 161,440 (28) |
| $66,000 - $87,999 | 123,175 (21) | 2,295 (22) |  | 125,470 (21) |
| $88,000 or more | 86,640 (15) | 1,685 (16) |  | 88,325 (15) |
| Expected primary payer |  |  | <0.001 |  |
| Private | 113,330 (19) | 1,610 (15) |  | 114,940 (19) |
| Medicaid | 71,600 (12) | 1,005 (9.3) |  | 72,605 (12) |
| Medicare | 387,845 (66) | 7,975 (74) |  | 395,820 (66) |
| Other | 12,925 (2.2) | 235 (2.2) |  | 13,160 (2.2) |
| Hospital region |  |  | <0.001 |  |
| Midwest | 126,355 (22) | 2,370 (22) |  | 128,725 (22) |
| Northeast | 109,610 (19) | 2,480 (23) |  | 112,090 (19) |
| South | 256,220 (44) | 4,095 (38) |  | 260,315 (44) |
| West | 94,175 (16) | 1,890 (17) |  | 96,065 (16) |
| Hospital bedsize |  |  | 0.001 |  |
| Large | 305,555 (52) | 6,035 (56) |  | 311,590 (52) |
| Medium | 174,185 (30) | 3,120 (29) |  | 177,305 (30) |
| Small | 106,620 (18) | 1,680 (16) |  | 108,300 (18) |
| Hospital location and teaching status |  |  | <0.001 |  |
| Rural | 37,650 (6.4) | 560 (5.2) |  | 38,210 (6.4) |
| Urban, non-teaching | 101,175 (17) | 1,580 (15) |  | 102,755 (17) |
| Urban, teaching | 447,535 (76) | 8,695 (80) |  | 456,230 (76) |
| Admission type |  |  | <0.001 |  |
| Elective | 205,585 (35) | 2,815 (26) |  | 208,400 (35) |
| Non-elective | 379,615 (65) | 8,015 (74) |  | 387,630 (65) |
| Charlson comorbidity index | 3.49 (1.99) | 5.33 (1.96) | <0.001 | 3.53 (2.01) |
| Diabetes Mellitus | 344,265 (59) | 6,970 (64) | <0.001 | 351,235 (59) |
| Previous congestive heart failure | 91,445 (16) | 3,040 (28) | <0.001 | 94,485 (16) |
| Hypertension | 302,985 (52) | 4,175 (39) | <0.001 | 307,160 (51) |
| Obesity | 91,880 (16) | 1,395 (13) | <0.001 | 93,275 (16) |
| Chronic pulmonary disease | 148,160 (25) | 2,935 (27) | 0.055 | 151,095 (25) |
| Chronic kidney disease | 193,595 (33) | 5,030 (46) | <0.001 | 198,625 (33) |
| Atrial fibrillation | 113,820 (19) | 3,380 (31) | <0.001 | 117,200 (20) |
| Liver disease | 20,250 (3.5) | 905 (8.4) | <0.001 | 21,155 (3.5) |
| Cancer | 14,400 (2.5) | 365 (3.4) | 0.008 | 14,765 (2.5) |
| Anemia | 219,085 (37) | 6,345 (59) | <0.001 | 225,430 (38) |
| Previous PCI | 68,635 (12) | 1,715 (16) | <0.001 | 70,350 (12) |
| Previous CABG | 73,370 (13) | 1,630 (15) | <0.001 | 75,000 (13) |
| Previous ICD insertion | 13,740 (2.3) | 270 (2.5) | 0.65 | 14,010 (2.3) |
| Previous PPM or CRT insertion | 19,850 (3.4) | 305 (2.8) | 0.15 | 20,155 (3.4) |
| Smoking status | 138,070 (24) | 1,980 (18) | <0.001 | 140,050 (23) |
| Coronary artery disease | 233,335 (40) | 7,130 (66) | <0.001 | 240,465 (40) |
| Dementia | 39,495 (6.7) | 805 (7.4) | 0.20 | 40,300 (6.7) |
| Previous stroke/TIA | 85,335 (15) | 1,565 (14) | 0.89 | 86,900 (15) |
| Previous myocardial infarction | 73,150 (12) | 1,680 (16) | <0.001 | 74,830 (13) |
| *1*Mean (SD); n (%) | | | | |
| *2*Design-based KruskalWallis test; Pearson's X^2: Rao & Scott adjustment | | | | |

## Outcomes Table:

| **Characteristic** | **Peripheral Artery Disease without Acute Myocardial Infarction** N = 586,360*1* | **Peripheral Artery Disease with Acute Myocardial Infarction** N = 10,835*1* | **p-value***2* | **Overall** N = 597,195*1* |
| --- | --- | --- | --- | --- |
| Died during hospitalization | 9,570 (1.6) | 1,605 (15) | <0.001 | 11,175 (1.9) |
| Length of stay (days) | 5.0 (3.0 – 9.0) | 10.0 (5.0 – 16.0) | <0.001 | 5.0 (3.0 – 9.0) |
| Inflation-adjusted total charge ($) | 74,459 (41,285 – 131,691) | 151,560 (83,295 – 273,753) | <0.001 | 75,272 (41,619 – 133,656) |
| Acute heart failure | 19,390 (3.3) | 2,950 (27) | <0.001 | 22,340 (3.7) |
| Ischemic stroke | 3,690 (0.6) | 370 (3.4) | <0.001 | 4,060 (0.7) |
| Transient ischemic attack | 1,585 (0.3) | 70 (0.6) | 0.001 | 1,655 (0.3) |
| Acute kidney injury | 96,590 (16) | 4,240 (39) | <0.001 | 100,830 (17) |
| Amputation | 71,675 (12) | 2,205 (20) | <0.001 | 73,880 (12) |
| *1*n (%); Median (Q1 – Q3) | | | | |
| *2*Pearson's X^2: Rao & Scott adjustment; Design-based KruskalWallis test | | | | |

## Multivariable Logistic Regression:

### All-Cause Mortality:

| **Characteristic** | **OR** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 6.04 (5.18 to 7.03) | <0.001 |
| Age, y | 1.03 (1.03 to 1.04) | <0.001 |
| Sex |  |  |
| Female | — |  |
| Male | 0.79 (0.72 to 0.87) | <0.001 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 1.20 (0.86 to 1.67) | 0.29 |
| Black | 0.84 (0.73 to 0.96) | 0.009 |
| Hispanic | 0.85 (0.72 to 0.99) | 0.041 |
| Native American | 0.86 (0.48 to 1.52) | 0.60 |
| Other | 1.39 (1.06 to 1.82) | 0.017 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | 1.11 (0.99 to 1.24) | 0.084 |
| $66,000 - $87,999 | 1.02 (0.89 to 1.15) | 0.82 |
| $88,000 or more | 0.91 (0.78 to 1.05) | 0.19 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | 0.80 (0.64 to 0.99) | 0.041 |
| Medicare | 0.99 (0.86 to 1.15) | 0.93 |
| Other | 1.45 (1.07 to 1.97) | 0.017 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 1.08 (0.93 to 1.25) | 0.33 |
| South | 1.18 (1.04 to 1.34) | 0.009 |
| West | 1.01 (0.86 to 1.18) | 0.91 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | 0.95 (0.85 to 1.05) | 0.31 |
| Small | 0.81 (0.70 to 0.92) | 0.002 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 0.95 (0.76 to 1.19) | 0.65 |
| Urban, teaching | 1.01 (0.82 to 1.23) | 0.94 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 1.88 (1.67 to 2.12) | <0.001 |
| Charlson comorbidity index | 1.22 (1.18 to 1.26) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | 0.60 (0.54 to 0.68) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | 1.14 (1.02 to 1.28) | 0.023 |
| Hypertension |  |  |
| No | — |  |
| Yes | 0.51 (0.44 to 0.58) | <0.001 |
| Obesity |  |  |
| No | — |  |
| Yes | 0.69 (0.60 to 0.81) | <0.001 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | 0.96 (0.86 to 1.07) | 0.49 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | 0.66 (0.57 to 0.77) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 1.53 (1.38 to 1.70) | <0.001 |
| Liver disease |  |  |
| No | — |  |
| Yes | 3.73 (3.20 to 4.35) | <0.001 |
| Cancer |  |  |
| No | — |  |
| Yes | 0.70 (0.54 to 0.90) | 0.006 |
| Anemia |  |  |
| No | — |  |
| Yes | 1.19 (1.08 to 1.32) | <0.001 |
| Previous PCI |  |  |
| No | — |  |
| Yes | 0.76 (0.64 to 0.89) | 0.001 |
| Previous CABG |  |  |
| No | — |  |
| Yes | 0.79 (0.67 to 0.93) | 0.004 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | 1.27 (1.00 to 1.63) | 0.055 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | 0.76 (0.60 to 0.96) | 0.019 |
| Smoking status |  |  |
| No | — |  |
| Yes | 0.78 (0.68 to 0.89) | <0.001 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 0.94 (0.84 to 1.05) | 0.26 |
| Dementia |  |  |
| No | — |  |
| Yes | 1.07 (0.93 to 1.23) | 0.37 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | 0.89 (0.79 to 1.01) | 0.081 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | 0.84 (0.72 to 0.98) | 0.026 |
| *1*OR = Odds Ratio, CI = Confidence Interval | | |

### Acute Heart Failure

| **Characteristic** | **OR** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 5.54 (4.92 to 6.24) | <0.001 |
| Age, y | 1.02 (1.01 to 1.02) | <0.001 |
| Sex |  |  |
| Female | — |  |
| Male | 0.95 (0.89 to 1.02) | 0.14 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 0.80 (0.61 to 1.04) | 0.10 |
| Black | 0.87 (0.80 to 0.96) | 0.004 |
| Hispanic | 0.83 (0.73 to 0.93) | 0.002 |
| Native American | 1.15 (0.81 to 1.63) | 0.45 |
| Other | 1.21 (0.99 to 1.48) | 0.061 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | 1.02 (0.93 to 1.11) | 0.70 |
| $66,000 - $87,999 | 0.99 (0.91 to 1.09) | 0.87 |
| $88,000 or more | 1.01 (0.90 to 1.12) | 0.90 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | 1.32 (1.15 to 1.51) | <0.001 |
| Medicare | 0.97 (0.87 to 1.07) | 0.54 |
| Other | 1.04 (0.80 to 1.34) | 0.77 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 0.93 (0.83 to 1.04) | 0.19 |
| South | 1.04 (0.95 to 1.14) | 0.38 |
| West | 1.01 (0.90 to 1.14) | 0.83 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | 1.02 (0.94 to 1.10) | 0.71 |
| Small | 1.01 (0.92 to 1.12) | 0.80 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 1.20 (1.01 to 1.43) | 0.034 |
| Urban, teaching | 1.09 (0.93 to 1.28) | 0.29 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 2.22 (2.04 to 2.41) | <0.001 |
| Charlson comorbidity index | 1.52 (1.49 to 1.54) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | 0.70 (0.64 to 0.76) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | 0.41 (0.37 to 0.45) | <0.001 |
| Hypertension |  |  |
| No | — |  |
| Yes | 0.70 (0.63 to 0.78) | <0.001 |
| Obesity |  |  |
| No | — |  |
| Yes | 1.30 (1.19 to 1.42) | <0.001 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | 1.00 (0.92 to 1.07) | 0.92 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | 0.56 (0.50 to 0.63) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 2.49 (2.31 to 2.69) | <0.001 |
| Liver disease |  |  |
| No | — |  |
| Yes | 0.96 (0.83 to 1.12) | 0.63 |
| Cancer |  |  |
| No | — |  |
| Yes | 0.47 (0.39 to 0.57) | <0.001 |
| Anemia |  |  |
| No | — |  |
| Yes | 1.40 (1.30 to 1.50) | <0.001 |
| Previous PCI |  |  |
| No | — |  |
| Yes | 0.76 (0.68 to 0.84) | <0.001 |
| Previous CABG |  |  |
| No | — |  |
| Yes | 0.86 (0.77 to 0.94) | 0.002 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | 1.86 (1.59 to 2.17) | <0.001 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | 0.95 (0.82 to 1.12) | 0.57 |
| Smoking status |  |  |
| No | — |  |
| Yes | 0.88 (0.80 to 0.97) | 0.007 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 1.71 (1.58 to 1.86) | <0.001 |
| Dementia |  |  |
| No | — |  |
| Yes | 0.58 (0.51 to 0.65) | <0.001 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | 0.69 (0.63 to 0.76) | <0.001 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | 0.76 (0.69 to 0.84) | <0.001 |
| *1*OR = Odds Ratio, CI = Confidence Interval | | |

### Acute Ischemic Stroke

| **Characteristic** | **OR** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 2.31 (1.76 to 3.04) | <0.001 |
| Age, y | 1.00 (1.00 to 1.01) | 0.21 |
| Sex |  |  |
| Female | — |  |
| Male | 0.75 (0.65 to 0.87) | <0.001 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 0.76 (0.38 to 1.50) | 0.43 |
| Black | 1.11 (0.91 to 1.36) | 0.30 |
| Hispanic | 1.09 (0.84 to 1.42) | 0.52 |
| Native American | 0.24 (0.03 to 1.75) | 0.16 |
| Other | 1.99 (1.37 to 2.87) | <0.001 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | 1.00 (0.82 to 1.23) | 0.98 |
| $66,000 - $87,999 | 1.11 (0.90 to 1.37) | 0.33 |
| $88,000 or more | 1.00 (0.78 to 1.29) | >0.99 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | 1.06 (0.79 to 1.42) | 0.70 |
| Medicare | 0.82 (0.66 to 1.03) | 0.088 |
| Other | 1.09 (0.62 to 1.93) | 0.75 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 0.84 (0.65 to 1.09) | 0.19 |
| South | 1.14 (0.92 to 1.39) | 0.23 |
| West | 0.91 (0.69 to 1.18) | 0.47 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | 0.96 (0.81 to 1.13) | 0.59 |
| Small | 0.81 (0.65 to 1.01) | 0.062 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 1.30 (0.85 to 1.99) | 0.23 |
| Urban, teaching | 1.35 (0.91 to 2.02) | 0.14 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 1.59 (1.31 to 1.92) | <0.001 |
| Charlson comorbidity index | 1.75 (1.71 to 1.80) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | 0.39 (0.33 to 0.45) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | 0.85 (0.70 to 1.04) | 0.11 |
| Hypertension |  |  |
| No | — |  |
| Yes | 0.72 (0.58 to 0.89) | 0.002 |
| Obesity |  |  |
| No | — |  |
| Yes | 0.98 (0.78 to 1.22) | 0.83 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | 0.46 (0.38 to 0.55) | <0.001 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | 0.23 (0.18 to 0.28) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 2.17 (1.81 to 2.59) | <0.001 |
| Liver disease |  |  |
| No | — |  |
| Yes | 0.63 (0.43 to 0.91) | 0.014 |
| Cancer |  |  |
| No | — |  |
| Yes | 0.49 (0.33 to 0.72) | <0.001 |
| Anemia |  |  |
| No | — |  |
| Yes | 1.20 (1.02 to 1.41) | 0.025 |
| Previous PCI |  |  |
| No | — |  |
| Yes | 0.70 (0.53 to 0.93) | 0.014 |
| Previous CABG |  |  |
| No | — |  |
| Yes | 0.80 (0.61 to 1.04) | 0.10 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | 0.57 (0.33 to 0.98) | 0.042 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | 0.76 (0.51 to 1.14) | 0.19 |
| Smoking status |  |  |
| No | — |  |
| Yes | 0.80 (0.65 to 0.99) | 0.036 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 1.08 (0.90 to 1.30) | 0.41 |
| Dementia |  |  |
| No | — |  |
| Yes | 0.66 (0.51 to 0.86) | 0.002 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | 1.78 (1.49 to 2.12) | <0.001 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | 0.52 (0.40 to 0.68) | <0.001 |
| *1*OR = Odds Ratio, CI = Confidence Interval | | |

### Transient Ischemic Attack

| **Characteristic** | **OR** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 1.33 (0.76 to 2.34) | 0.32 |
| Age, y | 1.01 (1.00 to 1.02) | 0.15 |
| Sex |  |  |
| Female | — |  |
| Male | 0.50 (0.39 to 0.63) | <0.001 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 0.44 (0.11 to 1.78) | 0.25 |
| Black | 0.55 (0.38 to 0.81) | 0.002 |
| Hispanic | 0.79 (0.52 to 1.21) | 0.28 |
| Native American | 1.33 (0.42 to 4.23) | 0.63 |
| Other | 1.06 (0.52 to 2.16) | 0.87 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | 1.21 (0.91 to 1.60) | 0.19 |
| $66,000 - $87,999 | 0.92 (0.66 to 1.28) | 0.61 |
| $88,000 or more | 0.75 (0.51 to 1.11) | 0.15 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | 0.92 (0.55 to 1.52) | 0.73 |
| Medicare | 1.07 (0.77 to 1.50) | 0.68 |
| Other | 1.05 (0.45 to 2.48) | 0.91 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 0.99 (0.69 to 1.42) | 0.95 |
| South | 1.16 (0.86 to 1.55) | 0.33 |
| West | 0.95 (0.65 to 1.39) | 0.80 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | 1.03 (0.80 to 1.33) | 0.80 |
| Small | 0.80 (0.57 to 1.12) | 0.19 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 0.94 (0.54 to 1.65) | 0.84 |
| Urban, teaching | 1.05 (0.63 to 1.76) | 0.84 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 0.87 (0.69 to 1.09) | 0.23 |
| Charlson comorbidity index | 1.56 (1.51 to 1.60) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | 0.33 (0.26 to 0.42) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | 0.46 (0.33 to 0.66) | <0.001 |
| Hypertension |  |  |
| No | — |  |
| Yes | 0.85 (0.62 to 1.16) | 0.31 |
| Obesity |  |  |
| No | — |  |
| Yes | 0.60 (0.40 to 0.90) | 0.013 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | 0.71 (0.55 to 0.91) | 0.006 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | 0.46 (0.33 to 0.66) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 1.22 (0.93 to 1.60) | 0.15 |
| Liver disease |  |  |
| No | — |  |
| Yes | 0.34 (0.16 to 0.73) | 0.006 |
| Cancer |  |  |
| No | — |  |
| Yes | 0.37 (0.18 to 0.78) | 0.009 |
| Anemia |  |  |
| No | — |  |
| Yes | 0.75 (0.60 to 0.95) | 0.017 |
| Previous PCI |  |  |
| No | — |  |
| Yes | 1.22 (0.87 to 1.71) | 0.26 |
| Previous CABG |  |  |
| No | — |  |
| Yes | 1.03 (0.72 to 1.47) | 0.88 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | 1.44 (0.77 to 2.71) | 0.25 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | 1.21 (0.71 to 2.06) | 0.49 |
| Smoking status |  |  |
| No | — |  |
| Yes | 1.02 (0.77 to 1.36) | 0.89 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 1.30 (0.98 to 1.73) | 0.070 |
| Dementia |  |  |
| No | — |  |
| Yes | 0.57 (0.38 to 0.88) | 0.010 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | 1.32 (0.99 to 1.75) | 0.057 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | 0.44 (0.31 to 0.64) | <0.001 |
| *1*OR = Odds Ratio, CI = Confidence Interval | | |

### Acute Kidney Injury

| **Characteristic** | **OR** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 2.50 (2.26 to 2.77) | <0.001 |
| Age, y | 1.02 (1.02 to 1.02) | <0.001 |
| Sex |  |  |
| Female | — |  |
| Male | 1.16 (1.12 to 1.20) | <0.001 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 0.81 (0.71 to 0.93) | 0.003 |
| Black | 0.88 (0.84 to 0.93) | <0.001 |
| Hispanic | 0.85 (0.80 to 0.90) | <0.001 |
| Native American | 0.69 (0.56 to 0.86) | <0.001 |
| Other | 1.00 (0.90 to 1.11) | 0.98 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | 0.95 (0.91 to 1.00) | 0.038 |
| $66,000 - $87,999 | 0.96 (0.92 to 1.01) | 0.11 |
| $88,000 or more | 0.92 (0.87 to 0.97) | 0.004 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | 1.15 (1.08 to 1.23) | <0.001 |
| Medicare | 0.74 (0.70 to 0.77) | <0.001 |
| Other | 0.97 (0.86 to 1.10) | 0.65 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 0.97 (0.92 to 1.03) | 0.38 |
| South | 1.09 (1.04 to 1.15) | <0.001 |
| West | 0.97 (0.91 to 1.03) | 0.36 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | 1.05 (1.01 to 1.10) | 0.021 |
| Small | 1.04 (0.99 to 1.09) | 0.15 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 1.13 (1.03 to 1.23) | 0.009 |
| Urban, teaching | 1.18 (1.08 to 1.28) | <0.001 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 2.39 (2.30 to 2.50) | <0.001 |
| Charlson comorbidity index | 1.06 (1.04 to 1.07) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | 1.21 (1.15 to 1.26) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | 1.11 (1.06 to 1.17) | <0.001 |
| Hypertension |  |  |
| No | — |  |
| Yes | 0.81 (0.76 to 0.85) | <0.001 |
| Obesity |  |  |
| No | — |  |
| Yes | 1.34 (1.28 to 1.40) | <0.001 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | 0.96 (0.92 to 1.01) | 0.10 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | 2.06 (1.92 to 2.22) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 1.09 (1.04 to 1.13) | <0.001 |
| Liver disease |  |  |
| No | — |  |
| Yes | 1.26 (1.16 to 1.38) | <0.001 |
| Cancer |  |  |
| No | — |  |
| Yes | 0.95 (0.86 to 1.05) | 0.31 |
| Anemia |  |  |
| No | — |  |
| Yes | 1.54 (1.48 to 1.59) | <0.001 |
| Previous PCI |  |  |
| No | — |  |
| Yes | 0.87 (0.82 to 0.93) | <0.001 |
| Previous CABG |  |  |
| No | — |  |
| Yes | 0.89 (0.84 to 0.94) | <0.001 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | 0.93 (0.84 to 1.03) | 0.19 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | 0.87 (0.80 to 0.95) | 0.003 |
| Smoking status |  |  |
| No | — |  |
| Yes | 0.94 (0.90 to 0.98) | 0.007 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 0.99 (0.95 to 1.03) | 0.60 |
| Dementia |  |  |
| No | — |  |
| Yes | 0.99 (0.93 to 1.06) | 0.75 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | 0.90 (0.86 to 0.95) | <0.001 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | 0.87 (0.82 to 0.92) | <0.001 |
| *1*OR = Odds Ratio, CI = Confidence Interval | | |

### Amputation

| **Characteristic** | **OR** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 1.44 (1.29 to 1.62) | <0.001 |
| Age, y | 1.00 (1.00 to 1.00) | 0.093 |
| Sex |  |  |
| Female | — |  |
| Male | 1.27 (1.22 to 1.32) | <0.001 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 0.92 (0.79 to 1.06) | 0.25 |
| Black | 1.38 (1.31 to 1.45) | <0.001 |
| Hispanic | 0.96 (0.90 to 1.02) | 0.19 |
| Native American | 1.21 (1.0 to 1.47) | 0.056 |
| Other | 0.91 (0.80 to 1.04) | 0.17 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | 0.96 (0.91 to 1.00) | 0.056 |
| $66,000 - $87,999 | 0.88 (0.83 to 0.92) | <0.001 |
| $88,000 or more | 0.79 (0.74 to 0.84) | <0.001 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | 1.30 (1.21 to 1.40) | <0.001 |
| Medicare | 1.29 (1.22 to 1.37) | <0.001 |
| Other | 1.15 (1.01 to 1.31) | 0.038 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 0.92 (0.86 to 0.99) | 0.030 |
| South | 1.23 (1.17 to 1.30) | <0.001 |
| West | 1.05 (0.99 to 1.13) | 0.13 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | 0.96 (0.91 to 1.00) | 0.074 |
| Small | 0.86 (0.82 to 0.91) | <0.001 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 0.81 (0.74 to 0.88) | <0.001 |
| Urban, teaching | 0.94 (0.86 to 1.02) | 0.12 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 1.00 (0.96 to 1.05) | 0.97 |
| Charlson comorbidity index | 1.04 (1.02 to 1.06) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | 1.74 (1.65 to 1.84) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | 1.14 (1.08 to 1.20) | <0.001 |
| Hypertension |  |  |
| No | — |  |
| Yes | 0.84 (0.79 to 0.88) | <0.001 |
| Obesity |  |  |
| No | — |  |
| Yes | 0.78 (0.74 to 0.83) | <0.001 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | 0.92 (0.88 to 0.97) | 0.002 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | 0.85 (0.79 to 0.91) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 1.12 (1.07 to 1.18) | <0.001 |
| Liver disease |  |  |
| No | — |  |
| Yes | 0.93 (0.84 to 1.03) | 0.15 |
| Cancer |  |  |
| No | — |  |
| Yes | 0.80 (0.71 to 0.91) | <0.001 |
| Anemia |  |  |
| No | — |  |
| Yes | 2.33 (2.24 to 2.43) | <0.001 |
| Previous PCI |  |  |
| No | — |  |
| Yes | 0.82 (0.77 to 0.88) | <0.001 |
| Previous CABG |  |  |
| No | — |  |
| Yes | 0.98 (0.92 to 1.04) | 0.56 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | 0.87 (0.76 to 0.98) | 0.025 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | 0.92 (0.83 to 1.02) | 0.12 |
| Smoking status |  |  |
| No | — |  |
| Yes | 0.91 (0.87 to 0.96) | <0.001 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 0.98 (0.93 to 1.02) | 0.31 |
| Dementia |  |  |
| No | — |  |
| Yes | 1.62 (1.52 to 1.74) | <0.001 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | 1.15 (1.09 to 1.21) | <0.001 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | 0.94 (0.88 to 1.00) | 0.053 |
| *1*OR = Odds Ratio, CI = Confidence Interval | | |

## Multivariable Linear Regression:

### Length of Stay:

| **Characteristic** | **Beta** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 4.3 (3.8 to 4.9) | <0.001 |
| Age, y | -0.01 (-0.01 to -0.01) | <0.001 |
| Sex |  |  |
| Female | — |  |
| Male | 0.27 (0.18 to 0.35) | <0.001 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 0.57 (-0.14 to 1.3) | 0.12 |
| Black | 0.65 (0.52 to 0.78) | <0.001 |
| Hispanic | 0.05 (-0.12 to 0.22) | 0.57 |
| Native American | 0.11 (-0.34 to 0.56) | 0.63 |
| Other | 0.42 (0.07 to 0.77) | 0.019 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | -0.07 (-0.18 to 0.04) | 0.23 |
| $66,000 - $87,999 | -0.14 (-0.26 to -0.03) | 0.017 |
| $88,000 or more | -0.11 (-0.26 to 0.04) | 0.16 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | 0.80 (0.61 to 0.98) | <0.001 |
| Medicare | 0.00 (-0.12 to 0.11) | 0.97 |
| Other | 0.53 (0.20 to 0.86) | 0.001 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 0.94 (0.76 to 1.1) | <0.001 |
| South | 0.61 (0.48 to 0.73) | <0.001 |
| West | -0.11 (-0.27 to 0.06) | 0.20 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | -0.44 (-0.57 to -0.31) | <0.001 |
| Small | -0.76 (-0.90 to -0.62) | <0.001 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 0.28 (0.06 to 0.51) | 0.012 |
| Urban, teaching | 0.82 (0.61 to 1.0) | <0.001 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 2.7 (2.6 to 2.8) | <0.001 |
| Charlson comorbidity index | 0.52 (0.46 to 0.57) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | 0.22 (0.10 to 0.35) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | 0.46 (0.31 to 0.60) | <0.001 |
| Hypertension |  |  |
| No | — |  |
| Yes | -0.71 (-0.84 to -0.59) | <0.001 |
| Obesity |  |  |
| No | — |  |
| Yes | 0.21 (0.09 to 0.33) | <0.001 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | -0.38 (-0.49 to -0.27) | <0.001 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | -1.1 (-1.3 to -0.94) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 0.89 (0.76 to 1.0) | <0.001 |
| Liver disease |  |  |
| No | — |  |
| Yes | 0.46 (0.15 to 0.76) | 0.003 |
| Cancer |  |  |
| No | — |  |
| Yes | -0.73 (-1.0 to -0.44) | <0.001 |
| Anemia |  |  |
| No | — |  |
| Yes | 3.0 (2.9 to 3.1) | <0.001 |
| Previous PCI |  |  |
| No | — |  |
| Yes | -0.78 (-0.90 to -0.66) | <0.001 |
| Previous CABG |  |  |
| No | — |  |
| Yes | -0.67 (-0.79 to -0.55) | <0.001 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | -1.0 (-1.2 to -0.79) | <0.001 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | -0.83 (-1.0 to -0.65) | <0.001 |
| Smoking status |  |  |
| No | — |  |
| Yes | -0.27 (-0.37 to -0.17) | <0.001 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 0.12 (0.02 to 0.23) | 0.025 |
| Dementia |  |  |
| No | — |  |
| Yes | 0.08 (-0.12 to 0.28) | 0.43 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | -0.28 (-0.40 to -0.17) | <0.001 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | -0.81 (-0.94 to -0.67) | <0.001 |
| *1*CI = Confidence Interval | | |

### Inflation Adjusted Total Charge:

| **Characteristic** | **Beta** **(95% CI)***1* | **p-value** |
| --- | --- | --- |
| Peripheral Artery Disease Categories |  |  |
| Peripheral Artery Disease without Acute Myocardial Infarction | — |  |
| Peripheral Artery Disease with Acute Myocardial Infarction | 83,821 (73,039 to 94,602) | <0.001 |
| Age, y | -202 (-274 to -129) | <0.001 |
| Sex |  |  |
| Female | — |  |
| Male | 2,431 (1,075 to 3,788) | <0.001 |
| Race |  |  |
| White | — |  |
| Asian or Pacific Islander | 2,498 (-5,692 to 10,687) | 0.55 |
| Black | 651 (-1,795 to 3,098) | 0.60 |
| Hispanic | 12,780 (8,834 to 16,725) | <0.001 |
| Native American | -21,378 (-27,914 to -14,842) | <0.001 |
| Other | 16,209 (9,416 to 23,002) | <0.001 |
| Residential income |  |  |
| $1 - $51,999 | — |  |
| $52,000 - $65,999 | -76 (-2,205 to 2,053) | 0.94 |
| $66,000 - $87,999 | -1,005 (-3,475 to 1,465) | 0.43 |
| $88,000 or more | 3,850 (344 to 7,357) | 0.031 |
| Expected primary payer |  |  |
| Private | — |  |
| Medicaid | -623 (-3,318 to 2,072) | 0.65 |
| Medicare | -2,627 (-4,656 to -598) | 0.011 |
| Other | 1,352 (-3,856 to 6,561) | 0.61 |
| Hospital region |  |  |
| Midwest | — |  |
| Northeast | 17,523 (12,885 to 22,160) | <0.001 |
| South | 20,291 (17,152 to 23,429) | <0.001 |
| West | 42,196 (37,306 to 47,087) | <0.001 |
| Hospital bedsize |  |  |
| Large | — |  |
| Medium | -4,502 (-8,063 to -942) | 0.013 |
| Small | -11,916 (-15,780 to -8,052) | <0.001 |
| Hospital location and teaching status |  |  |
| Rural | — |  |
| Urban, non-teaching | 35,407 (31,168 to 39,645) | <0.001 |
| Urban, teaching | 36,592 (32,997 to 40,186) | <0.001 |
| Admission type |  |  |
| Elective | — |  |
| Non-elective | 16,147 (14,470 to 17,824) | <0.001 |
| Charlson comorbidity index | 10,597 (9,741 to 11,452) | <0.001 |
| Diabetes Mellitus |  |  |
| No | — |  |
| Yes | -11,031 (-12,971 to -9,091) | <0.001 |
| Previous heart failure |  |  |
| No | — |  |
| Yes | -3,132 (-5,488 to -776) | 0.009 |
| Hypertension |  |  |
| No | — |  |
| Yes | -2,480 (-4,354 to -605) | 0.010 |
| Obesity |  |  |
| No | — |  |
| Yes | -22 (-1,964 to 1,921) | 0.98 |
| Chronic pulmonary disease |  |  |
| No | — |  |
| Yes | -5,400 (-7,106 to -3,694) | <0.001 |
| Chronic kidney disease |  |  |
| No | — |  |
| Yes | -23,793 (-26,829 to -20,756) | <0.001 |
| Atrial fibrillation |  |  |
| No | — |  |
| Yes | 7,763 (5,721 to 9,806) | <0.001 |
| Liver disease |  |  |
| No | — |  |
| Yes | 2,970 (-1,870 to 7,811) | 0.23 |
| Cancer |  |  |
| No | — |  |
| Yes | -17,317 (-22,170 to -12,465) | <0.001 |
| Anemia |  |  |
| No | — |  |
| Yes | 39,636 (37,855 to 41,418) | <0.001 |
| Previous PCI |  |  |
| No | — |  |
| Yes | -5,635 (-7,725 to -3,546) | <0.001 |
| Previous CABG |  |  |
| No | — |  |
| Yes | -7,611 (-9,653 to -5,569) | <0.001 |
| Previous ICD insertion |  |  |
| No | — |  |
| Yes | -12,033 (-15,608 to -8,458) | <0.001 |
| Previous PPM or CRT insertion |  |  |
| No | — |  |
| Yes | -12,639 (-15,623 to -9,654) | <0.001 |
| Smoking status |  |  |
| No | — |  |
| Yes | -1,112 (-2,737 to 514) | 0.18 |
| Coronary artery disease |  |  |
| No | — |  |
| Yes | 10,623 (8,754 to 12,492) | <0.001 |
| Dementia |  |  |
| No | — |  |
| Yes | -20,972 (-23,767 to -18,177) | <0.001 |
| Previous stroke/TIA |  |  |
| No | — |  |
| Yes | -7,844 (-9,579 to -6,109) | <0.001 |
| Previous myocardial infarction |  |  |
| No | — |  |
| Yes | -19,585 (-21,874 to -17,295) | <0.001 |
| *1*CI = Confidence Interval | | |