Cardiac Catheterization Laboratory Procedures (N = 11,601)
Cleveland Clinic is a regional and national referral center for percutaneous coronary intervention (PCI). A total of 11,601 cardiac catheterization procedures were done in 2015 to treat patients with simple and complex ischemic heart disease. The data comparisons below demonstrate outcomes at Cleveland Clinic compared with those at hospitals included in the American College of Cardiology National Cardiovascular Data Registry (ACC-NCDR) CathPCI Registry® that perform more than 500 PCIs per year. Data are based on a 1-year rolling average; therefore, totals reported here may differ from those reported elsewhere in this book.

Medical Conditions Among Patients Undergoing PCI Procedures (N = 1527)
Patients with complex medical backgrounds present greater challenges for PCI procedures. In 2015, patients who had PCI at Cleveland Clinic had more complex backgrounds than patients at comparable hospitals.

CABG = coronary artery bypass grafting, LV = left ventricular, MI = myocardial infarction
Source: ACC-NCDR database

Use of Appropriate Process Measures: Medications (N = 1527)
One of the ACC-NCDR key performance measures is the use of appropriate adjunctive medications before and after PCI. Cleveland Clinic achieved 100% use for all medication categories, which exceeds rates at comparable hospitals.

Source: ACC-NCDR database
In 2015, the rates of major vascular complications and stroke associated with PCI procedures at Cleveland Clinic were better than the rates at comparable hospitals. The rate of risk-adjusted bleeding events was slightly higher due to the use of hybrid procedures, such as valve replacement plus PCI, that are performed less frequently at other hospitals. Cleveland Clinic is continuously striving to achieve the best possible outcomes for patients.

**PCI Procedure Complications (N = 1527)**

In 2015, the rates of major vascular complications and stroke associated with PCI procedures at Cleveland Clinic were better than the rates at comparable hospitals. The rate of risk-adjusted bleeding events was slightly higher due to the use of hybrid procedures, such as valve replacement plus PCI, that are performed less frequently at other hospitals. Cleveland Clinic is continuously striving to achieve the best possible outcomes for patients.

**PCI Procedure, In-Hospital Mortality (N = 1509)**

The rate of in-hospital mortality among patients who had PCI procedures at Cleveland Clinic in 2015 was lower compared with rates at comparable hospitals.

**Door-to-Balloon Time (N = 62)\(^a\)**

The American College of Cardiology/American Heart Association (ACC/AHA) guideline for PCI inflation for patients who come to the emergency department with ST-elevated myocardial infarction (STEMI) is 60 minutes. Cleveland Clinic continues to improve door-to-balloon time to reduce the risk of mortality and morbidity. In 2015, the median time at Cleveland Clinic was 58 minutes.

\(^a\)A total of 62 patients treated for myocardial infarction at Cleveland Clinic’s emergency department met the ACC-NCDR reporting criteria for a primary diagnosis of STEMI. Among these patients, time to reperfusion was 58 minutes.
**PCI Procedures — Chronic Total Occlusion Technical Success With Hybrid Approach (N = 86)**

2014 – 2015

Chronic total occlusion (CTO) occurs in about 15% to 30% of patients with indications for coronary artery testing. Patients typically have a diminished quality of life due to anginal symptoms in spite of maximal antianginal therapy and/or significant ischemia during noninvasive ischemic testing. Benefits of CTO PCI are relief of anginal symptoms and improvement in left ventricular function, survival, and quality of life.

Cleveland Clinic interventionalists exhibit a very high success rate with this extremely complex type of PCI procedure.

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**PCI Procedures — Use of Radial Access (N = 1520)**

2015

In 2015, Cleveland Clinic performed more PCI procedures using radial access than did other comparable hospitals. The use of radial access is associated with reductions in bleeding complications, readmission rates, infection, and recovery time compared with PCI procedures done using a femoral approach.

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Source: ACC-NCDR database
Surgical Treatment for Ischemic Heart Disease (N = 1508)

CABG Volume

2015

Cleveland Clinic surgeons performed 1508 coronary artery bypass graft (CABG) procedures in 2015. A total of 692 were in combination with another procedure and 816 were isolated procedures, including reoperations.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated</td>
<td>816</td>
</tr>
<tr>
<td>CABG + other</td>
<td>692</td>
</tr>
</tbody>
</table>

CABG Volume, Primary and Reoperations (N = 1508)

2015

The majority of CABG procedures at Cleveland Clinic in 2015 were primary operations. A primary operation is the first time a patient has a particular procedure. Reoperations are repeat procedures and are considerably more complex.

CABG Plus Other Procedure, In-Hospital Mortality (N = 692)

2014 – 2015

In-hospital mortality rates among patients who had CABG surgery plus another procedure at Cleveland Clinic in 2015 (primary and reoperations) were lower than expected.
Isolated CABG Procedures, In-Hospital Mortality (N = 816)

2014 – 2015

Cleveland Clinic surgeons performed 816 isolated CABG procedures in 2015. The overall inpatient hospital mortality rate was 0.9%, which was lower than the expected rate of 1.9%.

Source: Data from the Vizient Clinical Data Base/Resource Manager™ used by permission of Vizient. All rights reserved.

Isolated CABG Procedures, In-Hospital Mortality
Primary and Reoperation (N = 816)

2015

Many patients who have CABG reoperations at Cleveland Clinic have very complex medical histories, which creates a higher risk of death. Despite these increased risks, the inpatient hospital mortality rates for primary operations and reoperations were lower than expected (0.4% and 1.9%, respectively).

Source: Data from the Vizient Clinical Data Base/Resource Manager™ used by permission of Vizient. All rights reserved.

STS CABG Quality Ratings

Overall

Approximately 12% to 15% of US hospitals received the STS “3 star” rating for CABG surgery. This denotes the highest category of quality. In the current analysis of national data covering the period from July 1, 2014, through June 30, 2015, the CABG surgery performance at Cleveland Clinic was found to lie in this highest quality tier, thereby earning the STS 3-star rating.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2015
Ischemic Heart Disease – Surgical Treatment

Isolated CABG: Additional Outcomes
Deep Sternal Wound Infection
2014 – 2015

The rate of deep sternal wound infection after CABG surgery was lower than expected at Cleveland Clinic in 2015. The rate at Cleveland Clinic was 0%, compared with the expected rate of 0.4%.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2015
**Ventilator Time > 24 Hours**

**2014 – 2015**
A total of 7.7% of patients who had isolated CABG surgery at Cleveland Clinic in 2015 spent more than 24 hours on a ventilator. This is lower than the expected rate of 9.5%.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2015

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**In-Hospital Reoperation**

**2014 – 2015**
The rate of in-hospital reoperation after isolated CABG surgery was lower than expected at Cleveland Clinic in 2015.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2015

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**Postoperative Stroke**

**2014 – 2015**
The expected rate of postoperative stroke after isolated CABG surgery was 1.2% in 2015. The rate was slightly lower (1.1%) at Cleveland Clinic.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2015
The Centers for Medicare & Medicaid Services (CMS) calculates 2 CABG outcomes measures based on Medicare claims and enrollment information. The most recent risk-adjusted data available from CMS are shown. Although Cleveland Clinic’s CABG patient mortality and readmissions rates are slightly lower than the US national rates, CMS ranks Cleveland Clinic’s performance on each as “no different than” the respective US national rate. To further reduce avoidable readmissions, Cleveland Clinic is focused on optimizing transitions from hospital to home or postacute facility. Specific initiatives have been implemented to ensure effective communication, education, and follow-up.

100%

Cleveland Clinic was 100% compliant with all Society of Thoracic Surgeons’ process measures in 2015. Measures include use of a perioperative beta blocker; use of a beta blocker, statin, and aspirin at discharge; and use of an internal mammary artery during isolated CABG surgery.

Postoperative Renal Failure
2014 – 2015

Postoperative renal failure occurred in 1.5% of patients who had isolated CABG surgery at Cleveland Clinic in 2015. This was lower than the expected rate of 3.6%.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2015

CABG All-Cause 30-Day Mortality and All-Cause 30-Day Readmissions
July 2012 – June 2015

The Centers for Medicare & Medicaid Services (CMS) calculates 2 CABG outcomes measures based on Medicare claims and enrollment information. The most recent risk-adjusted data available from CMS are shown. Although Cleveland Clinic’s CABG patient mortality and readmissions rates are slightly lower than the US national rates, CMS ranks Cleveland Clinic’s performance on each as “no different than” the respective US national rate. To further reduce avoidable readmissions, Cleveland Clinic is focused on optimizing transitions from hospital to home or postacute facility. Specific initiatives have been implemented to ensure effective communication, education, and follow-up.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2015
Acute Myocardial Infarction

AMI All-Cause 30-Day Mortality and All-Cause 30-Day Readmissions
July 2012 – June 2015

<table>
<thead>
<tr>
<th>Percent</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Cleveland Clinic</td>
</tr>
<tr>
<td></td>
<td>National rate^</td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
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<td>0</td>
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</tr>
</tbody>
</table>

N = 462  Readmissions  731

^Source: medicare.gov/hospitalcompare

The Centers for Medicare & Medicaid Services (CMS) calculates 2 AMI outcomes measures based on Medicare claims and enrollment information. The most recent risk-adjusted data available from CMS are shown. Although Cleveland Clinic's AMI patient mortality rate is slightly lower than the US national rate, CMS ranks Cleveland Clinic's performance as “no different than” the US national rate. Cleveland Clinic's AMI readmissions rate is slightly higher than the US national rate and also ranked by CMS as “no different than” the US national rate. To further reduce avoidable readmissions, Cleveland Clinic is focused on optimizing transitions from hospital to home or postacute facility. Specific initiatives have been implemented to ensure effective communication, education, and follow-up.