



Measuring and understanding outcomes of medical treatments promotes quality improvement. Cleveland Clinic has created a series of Outcomes books similar to this one for its clinical institutes. Designed for a physician audience, the Outcomes books contain a summary of many of our surgical and medical treatments, with a focus on outcomes data and a review of new technologies and innovations.

The Outcomes books are not a comprehensive analysis of all treatments provided at Cleveland Clinic, and omission of a particular treatment does not necessarily mean we do not offer that treatment. When there are no recognized clinical outcome measures for a specific treatment, we may report process measures associated with improved outcomes. When process measures are unavailable, we may report volume measures; a relationship has been demonstrated between volume and improved outcomes for many treatments, particularly those involving surgical and procedural techniques.

In addition to these institute-based books of clinical outcomes, Cleveland Clinic supports transparent public reporting of healthcare quality data. The following reports are available to the public:

- Joint Commission Performance Measurement Initiative (qualitycheck.org)
- Centers for Medicare and Medicaid Services (CMS) Hospital Compare (HospitalCompare.hhs.gov), and Physician Compare (medicare.gov/PhysicianCompare)
- Cleveland Clinic Quality Performance Report (clevelandclinic.org/QPR)

Our commitment to transparent reporting of accurate, timely information about patient care reflects Cleveland Clinic's culture of continuous improvement and may help referring physicians make informed decisions.

We hope you find these data valuable, and we invite your feedback. Please send your comments and questions via email to:

OutcomesBooksFeedback@ccf.org or scan here.



To view all of our Outcomes books, please visit clevelandclinic.org/outcomes.



Dear Colleague:

Welcome to this 2014 Cleveland Clinic Outcomes book. Every year, we publish Outcomes books for 14 clinical institutes with multiple specialty services. These publications are unique in healthcare. Each one provides an overview of medical or surgical trends, innovations, and clinical data for a particular specialty over the past year. We are pleased to make this information available.

Cleveland Clinic uses data to manage outcomes across the full continuum of care. Our unique organizational structure contributes to our success. Patient services at Cleveland Clinic are delivered through institutes, and each institute is based on a single disease or organ system. Institutes combine medical and surgical services, along with research and education, under unified leadership. Institutes define quality benchmarks for their specialty services and report on longitudinal progress.

All Cleveland Clinic Outcomes books are available in print and online. Additional data are available through our online Quality Performance Report (clevelandclinic.org/QPR). The site offers process measure, outcome measure, and patient experience data in advance of national and state public reporting sites.

Our practice of releasing annual outcomes books has become increasingly relevant as healthcare transforms from a volume-based to a value-based system. We appreciate your interest and hope you find this information useful and informative.

Sincerely,

A handwritten signature in black ink, appearing to read "DMC".

Delos M. Cosgrove, MD
CEO and President

what's inside

Chairman's Letter_____	4	Lung and Heart-Lung Transplant	58
Introduction_____	5	Peripheral Vascular Disease	60
Institute Overview_____	6	Cerebrovascular Disease	65
Quality and Outcomes Measures		Thoracic Surgery	66
Surgical Overview	8	Preventive Cardiology and Rehabilitation	73
Ischemic Heart Disease		Sports Cardiology	80
Interventional Treatment	13	Cardio-Oncology	81
Surgical Treatment	16	Surgical Quality Improvement - HVI NSQIP	82
AMI	20	Patient Experience — Heart & Vascular Institute	86
Cardiac Rhythm Disorders	22	Cleveland Clinic — Implementing	
Valve Disease	28	Value-Based Care	88
Aortic Disease	37	Innovations_____	94
Hypertrophic Obstructive Cardiomyopathy	48	Contact Information_____	100
Congenital Heart Disease	50	About Cleveland Clinic_____	102
Pericardial Disease	53	Resources_____	104
Heart Failure and Transplant	55	Institute Resources_____	106

Prefer an e-version?

Visit clevelandclinic.org/OutcomesOnline, and we'll remove you from the hard-copy mailing list and email you when next year's books are online.

Chairman's Letter

Dear Colleagues,

Thank you for your interest in the Sydell and Arnold Miller Family Heart & Vascular Institute's 2014 outcomes. This annual publication is a testament to Cleveland Clinic's commitment to tracking and reporting outcomes to help guide patient decisions and enable us to continuously improve patient care.

2014 was a dynamic year for the Heart & Vascular Institute. In addition to achieving the outcomes reported in the following pages, our caregivers distinguished themselves with a wide range of achievements, including:



- Being recognized as the nation's No. 1 heart care program by *U.S. News & World Report* for the 20th consecutive year
- Ranking among the 3% of US hospitals to earn a 3-star (highest) score in all 3 categories of the Society of Thoracic Surgeons' risk-adjusted quality ratings for adult cardiac surgery and thoracic/lung surgery
- Successfully launching an adult heart transplantation program at Cleveland Clinic Florida while performing our highest-ever annual volume of pediatric heart transplants (11) in Cleveland
- Reporting the world's best results with transfemoral- and transapical-approach transcatheter aortic valve replacement from a 6-year series of Cleveland Clinic cases
- Establishing the Cleveland Clinic Cardiovascular Specialty Network with allied and affiliated centers across the country for contracting with large employers

We are most grateful to our many donors whose generosity and kindness have allowed us to continue our research mission to improve the care of our patients.

We welcome your feedback, questions, and ideas for collaboration. Please contact me via email at OutcomesBooksFeedback@ccf.org and reference the Heart & Vascular book in your message.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Svensson', written in a cursive style.

Lars G. Svensson, MD, PhD
Chairman, Heart & Vascular Institute
Professor of Surgery, Cleveland Clinic Lerner College of Medicine

Introduction

The team of specialists in Cleveland Clinic's Sydell and Arnold Miller Family Heart & Vascular Institute represents one of the world's largest and most experienced groups practicing cardiovascular medicine and surgery. Patients from 82 different nations traveled to Cleveland Clinic in 2014 for these specialists' expertise and patient-focused caregiving.

The Heart & Vascular Institute's reputation stems from unparalleled volumes and exemplary outcomes. This leadership and dedication is reflected in Cleveland Clinic's ranking as the nation's No. 1 heart care program for each of the past 20 years in *U.S. News & World Report's* "Best Hospitals" survey.

The institute brings together specialists in three broad departments — Cardiovascular Medicine, Thoracic and Cardiovascular Surgery, and Vascular Surgery — and organizes them into seven sections and 17 subspecialty centers and clinics to foster collaborative caregiving and innovative research. A total of 227 physicians and surgeons and 1,400 nurses work together to care for patients with a variety of conditions that often include complex medical histories.



Institute Overview

Heart & Vascular Institute Overview

2014

Patient Visits	483,596
Admissions	13,564
Beds	422
Coronary Intensive Care	24
Heart Failure Intensive Care	10
Cardiac, Vascular and Thoracic Surgery Intensive Care	76
Private Patient Rooms	283
Same-Day Recovery	29

Surgical Procedures

Cardiac Surgery

Cardiac Surgeries	4275
Valve Surgeries	2798
Coronary Artery Bypass Grafting (Isolated and Combined)	1247
Thoracic Aortic Repairs	1136
Surgeries for Septal Myectomy	191
Congenital Heart Surgeries (Adult and Pediatric)	411
Robotically Assisted Cardiac Surgeries	105

Transplant Surgery

Heart Transplants	65
Lung Transplants	106

Thoracic Surgery

General Thoracic Surgeries	1492
Esophageal Surgeries	192

Vascular Surgery

Vascular Surgeries (Open and Endovascular)	3120
Bypass Surgeries	229
Arteriovenous Access Surgeries	349

The data reported in the Institute Overview reflect volumes at Cleveland Clinic's main campus only. Data in other areas of the book may reflect volumes for main campus and other Cleveland-area Cleveland Clinic hospitals. For a complete list of Cleveland Clinic hospitals, visit clevelandclinic.org.



Aortic Surgery

Open Ascending Aorta and Aortic Arch Repairs	762
Open Descending Aorta and Thoracoabdominal Repairs	88
Open Abdominal Aortic Aneurysm Repairs	86
Endovascular Descending Aorta and Thoracoabdominal Repairs	200
Endovascular Abdominal Aortic Aneurysm Repairs	94

Cardiovascular Medicine Procedures

Interventional Cardiology

Diagnostic Cardiac Catheterizations	7614
Interventional Cardiac Procedures	1482
Percutaneous Aortic Valvuloplasties	119
Percutaneous Mitral Valvuloplasties	12
Percutaneous Atrial Septal Defect and Patent Foramen Ovale Closures	45

Electrophysiology

Electrophysiology Ablations	1440
Ablations for Atrial Fibrillation	772
Device Implants	1381
Leads Extracted	188

Diagnostic and Cardiac Imaging

Echocardiograms	76,110
Cardiac Computed Tomography (CT) Scans	7769
Cardiac Magnetic Resonance Imaging (MRI) Scans	3149
Stress Tests	7831
Nuclear Cardiology Tests	
Tc-Myoview-Rest	4430
Tc-Myoview-Stress	4425
Rubidium Heart (PET)	904
FDG Heart (PET)	529
MUGA	116
N-13 Ammonia Heart	16

Patients from *82 countries* received cardiovascular care at Cleveland Clinic in 2014.

Patients from all *50 states* traveled to Cleveland Clinic in 2014 for cardiovascular care.

