Selected Specialty Care

Cleveland Clinic

2016
Outcomes

Measuring Outcomes Promotes Quality Improvement

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 (medicare.gov/hospitalcompare), 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:

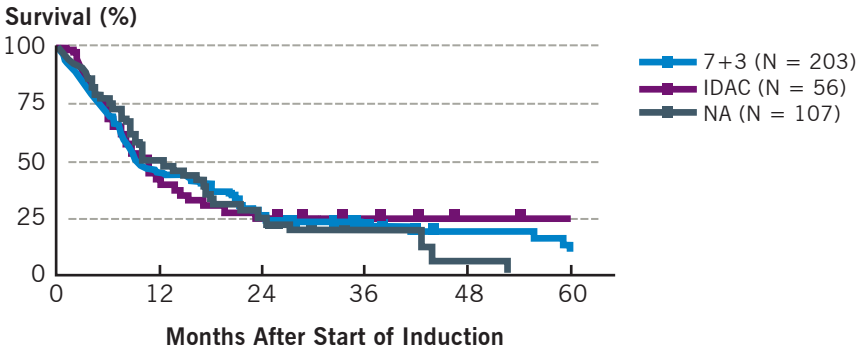
OutcomesBooksFeedback@ccf.org.

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

what's inside

Impact of Induction Chemotherapy Regimens on Overall Survival of Patients With Myelodysplastic Syndromes and Acute Myeloid Leukemia Following Hypomethylating Agent Failure (N = 366)

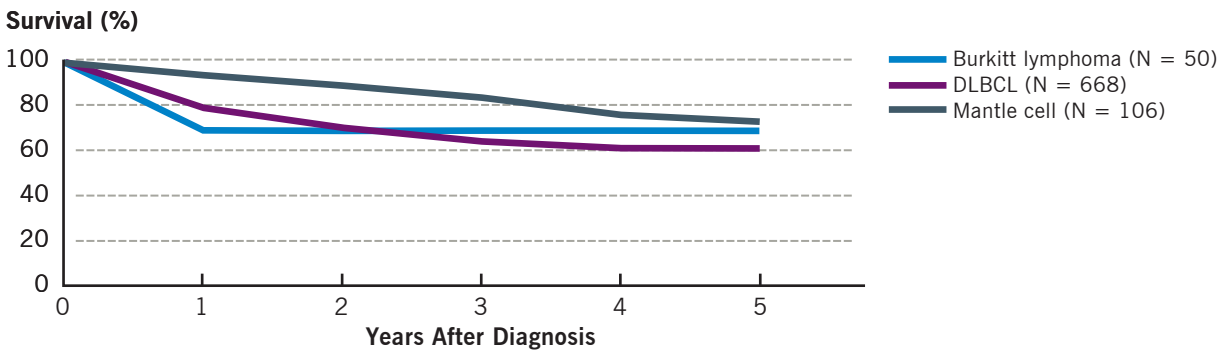
2005 – 2015



IDAC = intermediate- to high-dose cytarabine, NA = nucleoside analog

Five-Year Overall Survival of Patients With Aggressive Non-Hodgkin Lymphoma by Disease Type (N = 824)

2007 – 2015

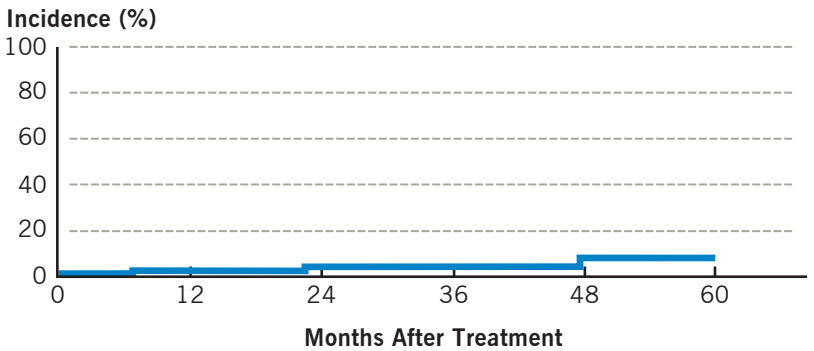


Number at Risk					
Burkitt lymphoma	32	26	23	19	13
DLBCL	490	360	253	174	103
Mantle cell	93	73	56	30	20

DLBCL = diffuse large B-cell lymphoma

Cumulative Incidence of Severe Late Toxic Effects After Modern Definitive Image-Guided Intensity-Modulated Radiation Therapy in Patients With Human Papillomavirus-Associated Oropharyngeal Cancer (N = 156)

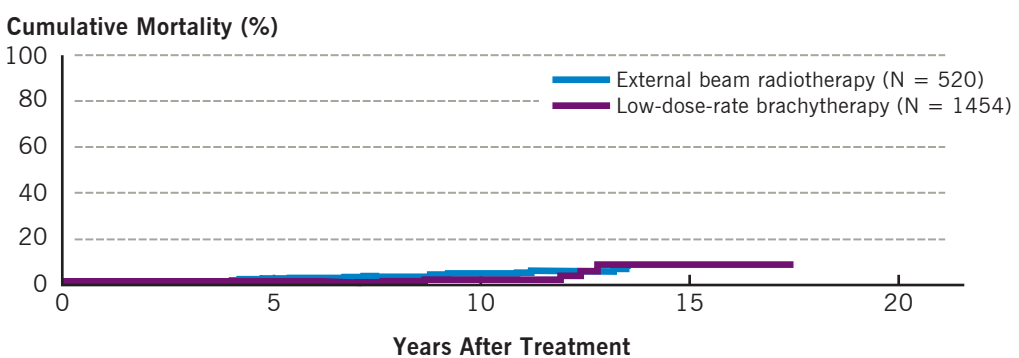
2009 – 2015



Number at risk	156	128	88	68	47	31	22	15	10	4	0

Cumulative Mortality Due to Prostate Cancer of Patients With Intermediate-Risk Prostate Cancer by Treatment Type[a] (N = 1974)

1996 – 2016



Mortality Rates (Number of Patients)			
External beam radiotherapy	2.0 (359)	5.0 (181)	8.5 (19)
Low-dose-rate brachytherapy	0.2 (550)	2.5 (86)	8.2 (5)

[a]National Comprehensive Cancer Network (NCCN). Prostate Cancer. NCCN Clinical Practice Guidelines in Oncology. V.2.2007. Fort Washington, PA: NCCN; 2007.

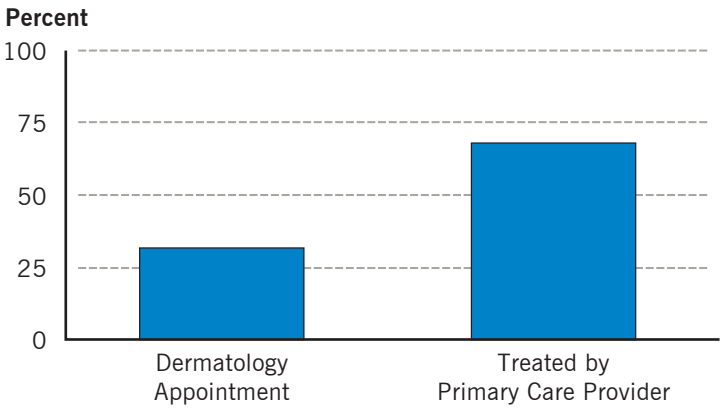
Teledermatology has been shown to reduce outpatient wait times and increase access while decreasing unnecessary office visits.[1,2] In July 2014, the Department of Dermatology launched a teledermatology consult program designed to triage appropriate patients into earlier dermatology appointments, avoid unneeded referrals, and provide informal consultations.

The program has expanded to 5 of Cleveland Clinic's Express Care Clinics, which are predominantly staffed by nurse practitioners and physician assistants. Store-and-forward teledermatology consultations were placed using secure smartphones or tablets designated for this purpose. Patient photos, along with pertinent clinical documentation in the electronic medical record, were reviewed by a dermatology staff member and resident. Triage outcomes were grouped into 2 categories: The treatment plan outlined by the primary care provider was reasonable and a dermatology appointment could be deferred, or a dermatology appointment was required for further evaluation and treatment.

Fewer than one-third (32%) of the consultations required a dermatology appointment. A median of 8 days (interquartile range = 5–28) elapsed between the teledermatology consult and the first appointment offered to the patient. The teledermatology consult program has decreased unnecessary visits, resulted in greater access to dermatologists, and saved patients time, travel, and expense. Plans are being made to expand its availability to an additional 13 regional Cleveland Clinic Express Care Clinics in 2017.

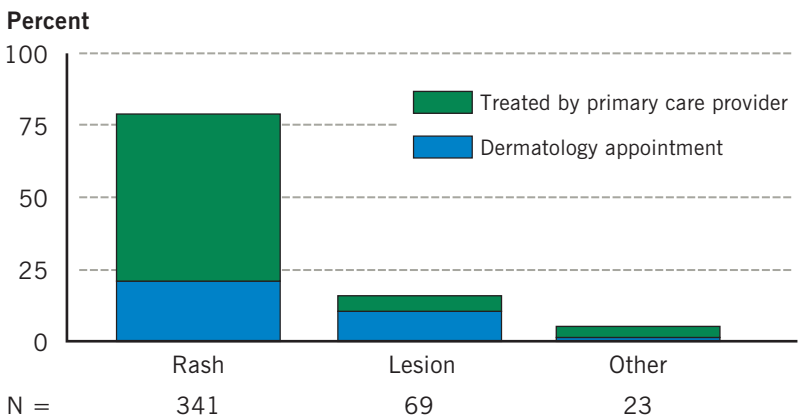
Teledermatology Triage Outcome (N = 433)

July 2014 – December 2016



Reason for Consult and Triage Outcome (N = 433)

July 2014 – December 2016



References

1. Warshaw EM, Hillman YJ, Greer NL, Hagel EM, MacDonald R, Rutks IR, Wilt TJ. Teledermatology for diagnosis and management of skin conditions: a systematic review. *J Am Acad Dermatol*. 2011 Apr;64(4):759-772.
2. Whited JD, Warshaw EM, Kapur K, et al. Clinical course outcomes for store and forward teledermatology versus conventional consultation: a randomized trial. *J Telemed Telecare*. 2013 Jun;19(4):197-204.

Treatment of Severe Alopecia Areata With Oral Tofacitinib Citrate

Tofacitinib is a janus kinase 1/3 inhibitor that is FDA-approved for the treatment of rheumatoid arthritis and that has recently been used to treat alopecia areata (AA). The Department of Dermatology conducted a retrospective chart review of 13 AA patients presenting from March 2015 to November 2016, including 9 with alopecia totalis or alopecia universalis, with a mean pretreatment scalp hair loss of 93% calculated using the Severity of Alopecia Tool (SALT) score. All other AA therapies were stopped, and they were treated with tofacitinib initiated at 5 mg twice daily. Tofacitinib dose was titrated by 5 mg/day per month until the treating physician noted the first signs of regrowth, and then was maintained at that dose.

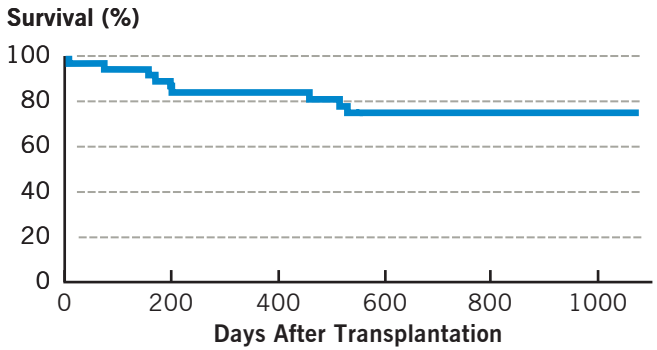
Regrowth, as measured by SALT and Wilcoxon signed-rank test, ranged from 2% to 90%, with a mean of 44.3% and median of 50.5% ($P < 0.05$). Seven patients (53.8%) achieved a regrowth of at least 50%. Response time ranged from 1 to 9 months, with an average of 4.2 months. One patient developed a morbilliform eruption and peripheral edema leading to tofacitinib discontinuation. Two patients stopped therapy after 3 months due to loss of insurance and within 2 weeks experienced shedding leading back to baseline. The remaining 10 patients continued treatment. Notably, 2 patients demonstrated lipid and liver abnormalities that resolved with dose reductions.

These results show that while tofacitinib is an effective treatment for severe AA, it lacks durability of effect when therapy is discontinued.

Patient 7 presented with alopecia totalis and attained 90% regrowth after 3 months of oral tofacitinib.

Intestinal Transplantation Patient Survival[a] (N = 39)

July 2013 – December 2015

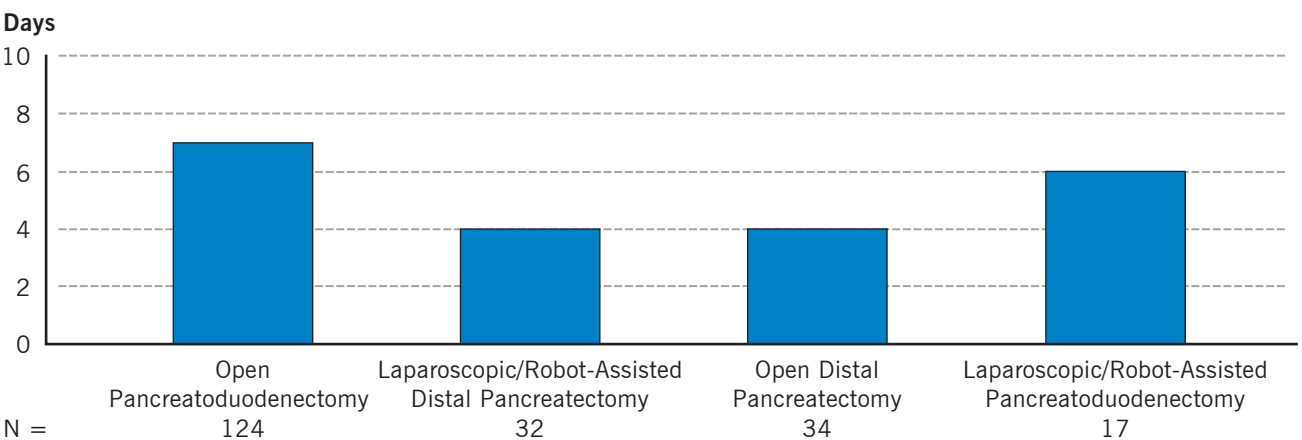


Source: Scientific Registry of Transplant Recipients (SRTR) srtr.org

[a]SRTR national average for 3-year patient survival = 80.32%

Median Length of Stay, Pancreatectomy Procedures[a] (N = 207)

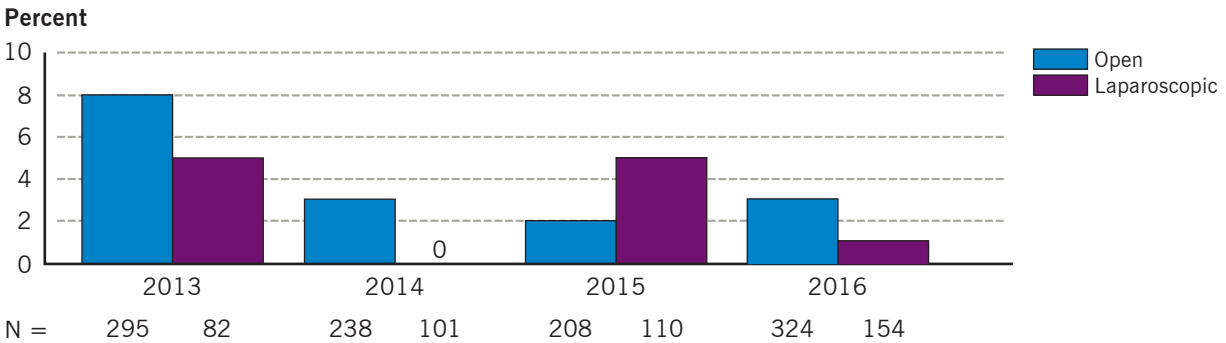
2016



[a]Includes Cleveland Clinic Weston data

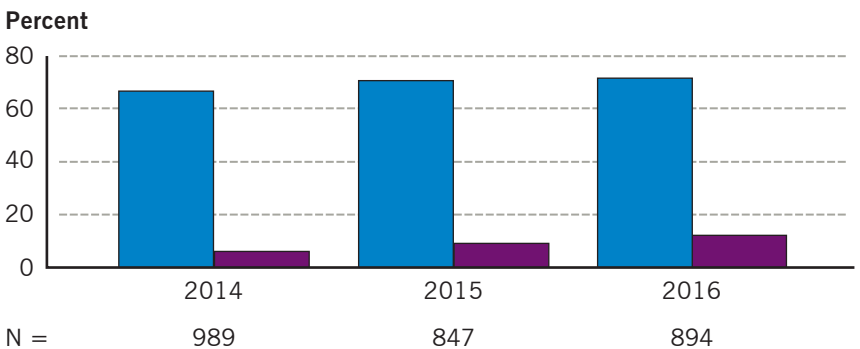
Crohn's Disease Organ Space Surgical Site Infection Rate

2013 – 2016



Immediate Breast Reconstruction[a]

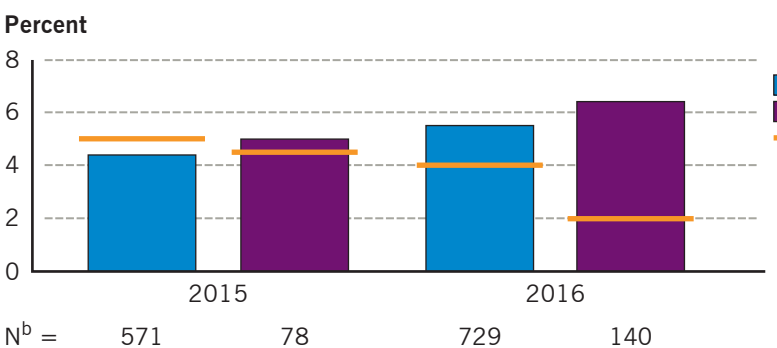
2014 – 2016



[a]Data are from Digestive Disease & Surgery Institute only

Thirty-Day Unplanned Hospital Readmission,[a] Ventral Hernia Repair

2015 – 2016



AHSQC = Americas Hernia Society Quality Collaborative

[a]Americas Hernia Society Quality Collaborative, ahsqc.org

[b]Includes Cleveland Clinic Weston data

Medical Weight Management (N = 397)

Medical weight management includes patient education in shared monthly nutrition visits and medical supervision in shared monthly medical appointments. Each group of participants focuses on 1 of 3 diet regimens: meal replacement, Mediterranean diet, or protein-sparing modified fast.

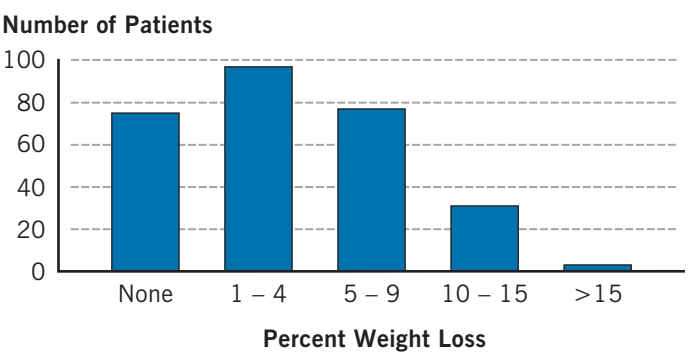
August 2014 – August 2016

	Meal Replacement	Mediterranean	PSMF
Patients, N	66	237	94
Average months in program	7.7	7.9	6.4
Dropped out of program	32	147	44
Switched to other diet	11	10	14

PSMF = protein-sparing modified fast.

Medical Weight Management Program Weight Loss (N = 310)

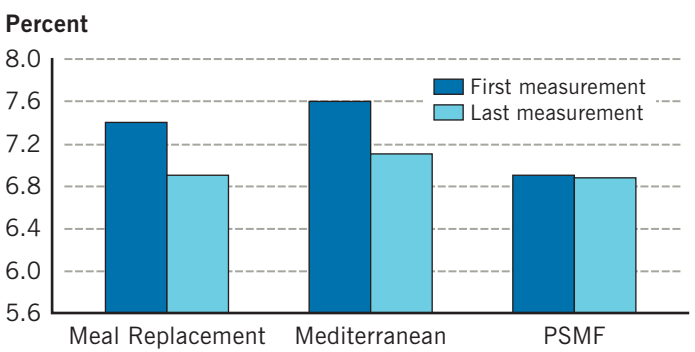
August 2014 – August 2016



Since program inception (August 2014), 76% of patients active in the program for at least 3 months lost at least some of their body weight. Forty-five percent (N = 138) lost more than 5% of their starting body weight. Mean entry weight was 257 pounds. Current program duration averaged 7.5 months.

Medical Weight Management HbA_{1c} Change by Program Type (N = 105)

August 2014 – August 2016

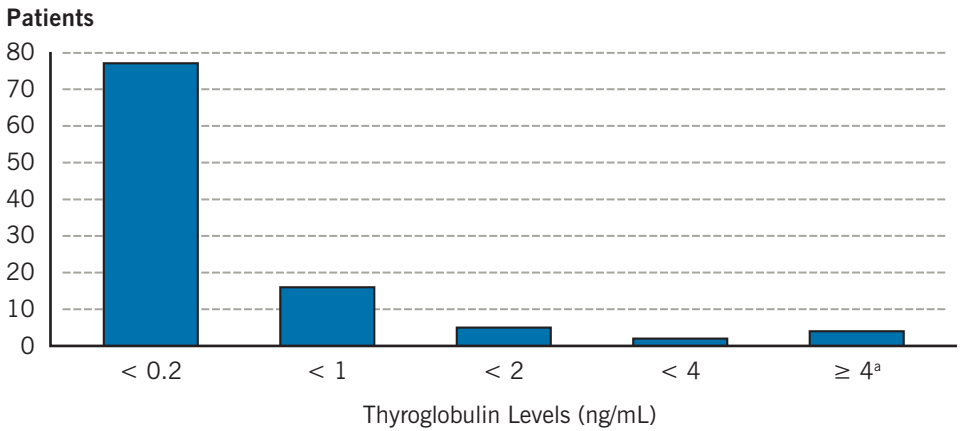


PSMF = protein-sparing modified fast

Both the meal replacement and Mediterranean dietary programs showed a mild improvement in HbA_{1c} for prediabetic and diabetic patients. The upper limit of normal for HbA_{1c} is 5.6%.

Thyroglobulin Levels Among Papillary Thyroid Cancer Patients 6 Months Post-Total Thyroidectomy (N = 104)

2012 – 2016

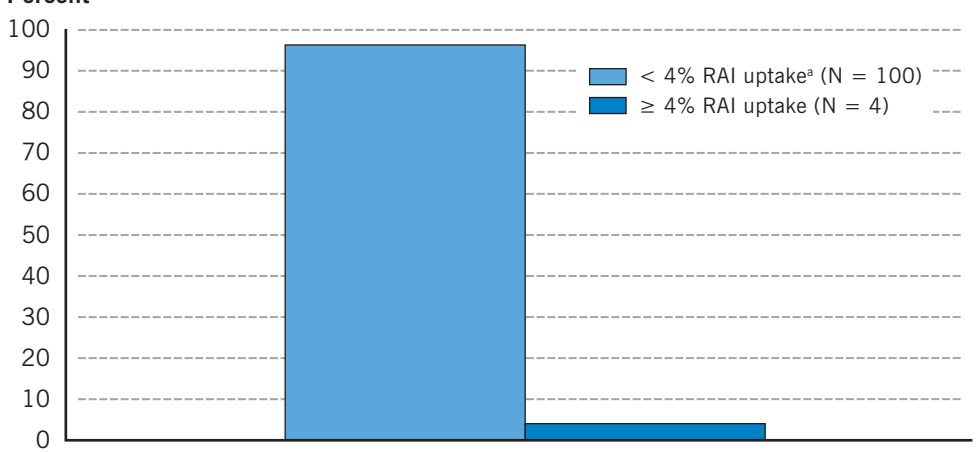


[a]7.6, 20.2, 57.3 ng/mL

For post-total thyroidectomy patients, completeness of thyroid surgery is assessed by the serum thyroglobulin levels 6 months postoperatively. Generally, an undetectable level (≤ 2 ng/mL) is a good indication of successful surgical treatment for thyroid cancer.

Radioactive Iodine Uptake in Papillary Thyroid Cancer Patients Post-Total Thyroidectomy (N = 104)

2012 – 2016



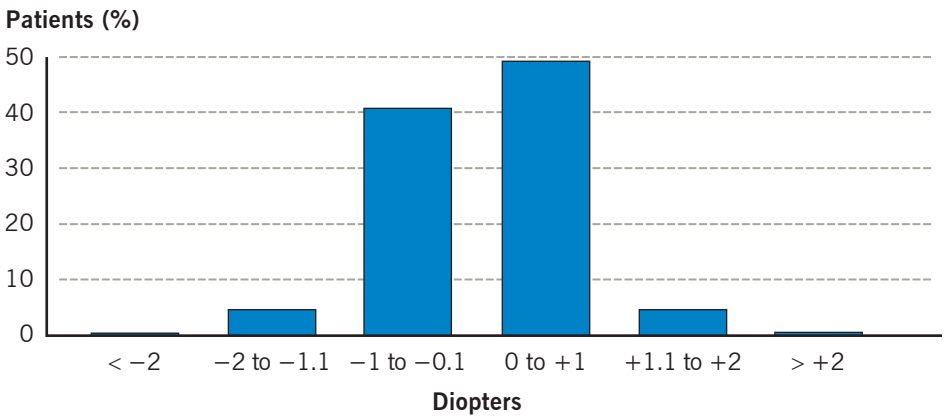
RAI = radioactive iodine

[a]< 4% uptake on the radioactive iodine scan represents a more complete removal of thyroid tissue.

Cataract Surgery

Difference Between Actual and Target Refractive Error (N = 2066)

2016

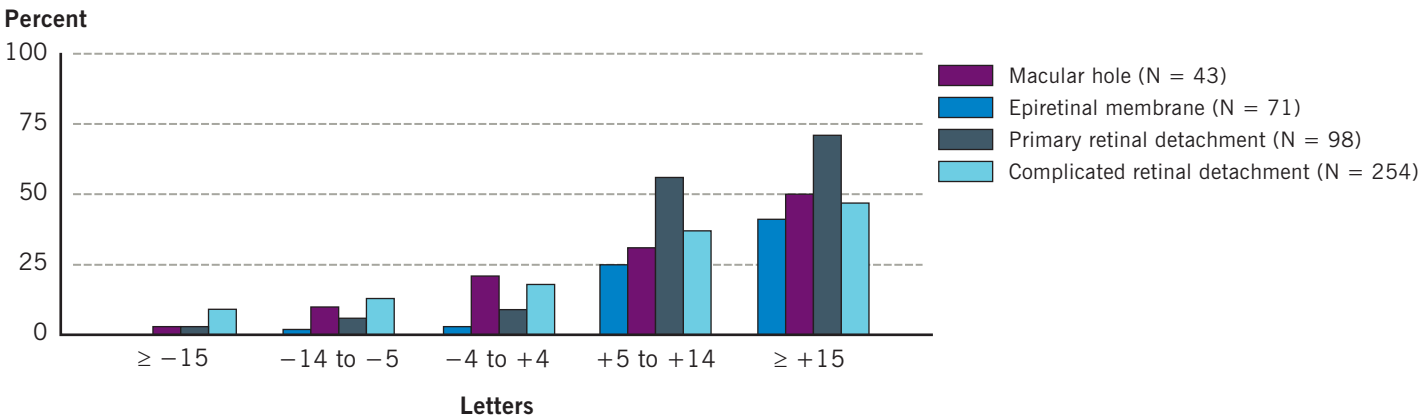


Most patients achieved a refractive outcome following cataract surgery that was near the anticipated target. Despite the large number of patients with other conditions that can influence the refractive outcome, or the accuracy in measuring the final refractive error, 89.9% of patients achieved a final spherical equivalent refractive error within 1 diopter of the expected result.

Vitreoretinal Surgery

Vision Improvement by Procedure (N = 466)

2016



Preoperative and postoperative Early Treatment Diabetic Retinopathy Study visual acuity was available for 466 patients, whose outcomes are shown in the graph above categorized by type of surgery.

As a tertiary care facility, Cole Eye Institute is called on to assist in difficult cases, such as giant retinal tears and complicated retinal detachments that have proliferative vitreoretinopathy (PVR), where often numerous surgeries have preceded the patients' evaluation at the institute. Detailed efficacy outcomes for these types of surgery were available for 298 patients in 2016. Although most patients had a previous retinal surgery, the reattachment rate in these difficult cases was 97.3%. Eight patients had to go back to the operating room for additional complicated retinal detachment repair. The mean improvement in vision after PVR retinal detachment repair was +15.3 ETDRS letters, with 40% of patients having a ≥ 3 line improvement in vision and 7.2% having a ≥ 3 line loss in vision.

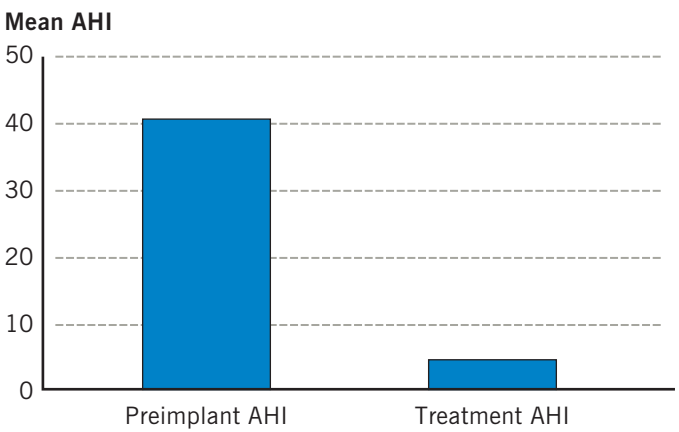
Surgical Sleep and Snoring

Hypoglossal nerve stimulation therapy is an emerging surgical treatment option for selected patients with obstructive sleep apnea (OSA). The Head & Neck Institute's Section of Surgical Sleep and Snoring is providing this therapy to qualified patients who have been diagnosed with moderate to severe OSA, are intolerant of continuous positive airway pressure therapy, and are not overweight.

Data on the first 20 patients implanted with the Inspire hypoglossal nerve stimulator device are presented. The apnea-hypopnea index (AHI) decreased from approximately 40 before surgery to 4.6 after surgery. All patients had a quantifiable improvement in their sleep apnea after the procedure. In general, patients reported meaningful improvement in their quality of life and daytime functioning.

Comparison of Preimplant and Treatment AHI (N = 20)

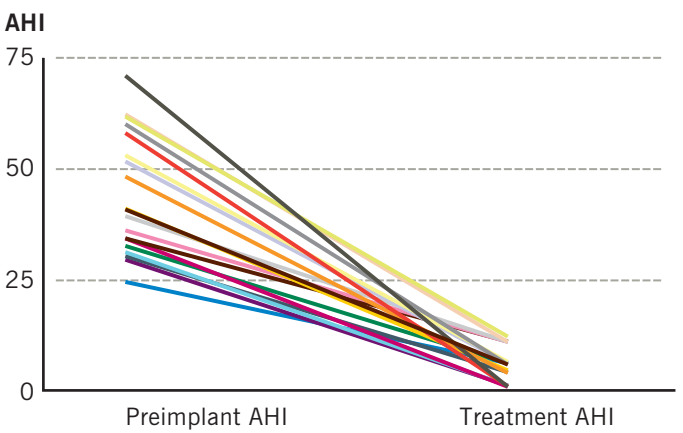
2016



AHI = apnea-hypopnea index

Individual Patient AHI Comparison: Preimplant vs Treatment AHI[a] (N = 20)

2016



AHI = apnea-hypopnea index

[a]The AHI is the number of complete cessations of breathing (apneas) and partial obstructions (hypopneas) in an hour.

Endoscopic Pituitary Surgery

The Minimally Invasive Cranial Base and Pituitary Surgery Program continues to push the boundaries with expanded approaches and an increased level of surgical complexity. In late 2016, the team added another fellowship-trained endoscopic neurosurgeon to bolster the ability to apply 2-surgeon, 4-handed minimally invasive endoscopic endonasal techniques to more patients in an expedited manner. Patient outcomes and complication rates (including postoperative cerebrospinal fluid leak) continue to be better than those in the literature and rival those achieved at other leading centers.

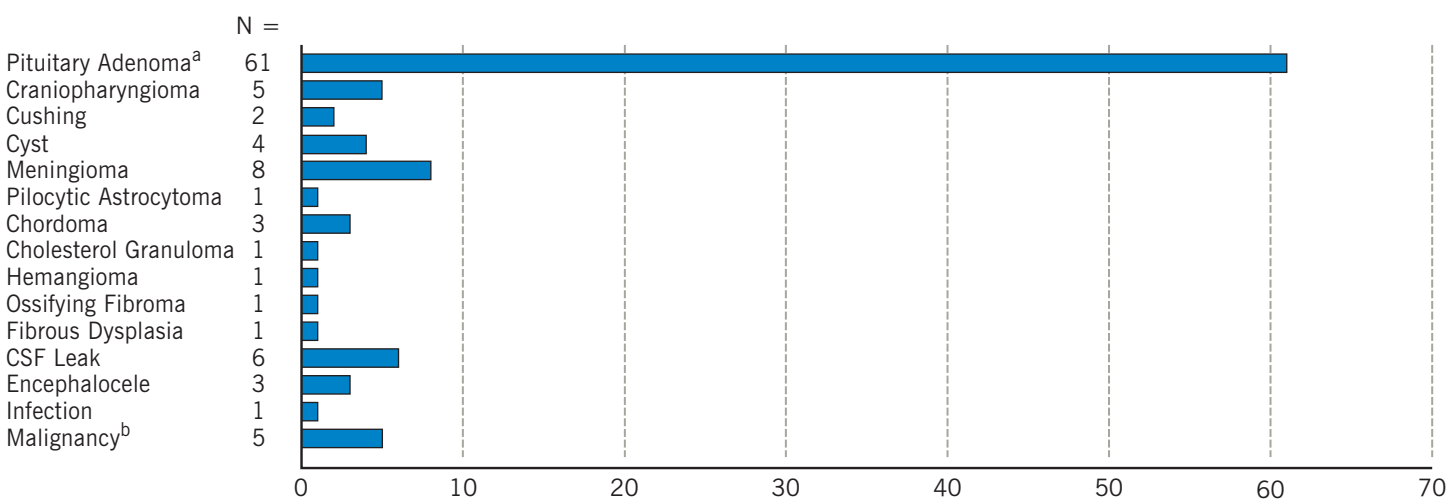
Patient Demographics (N = 103)

2016

Gender (N)	
Female	57
Male	46
Average age (years)	49
Maximum	92
Minimum	15

Lesions Approached (N = 103)

2016



CSF = cerebrospinal fluid

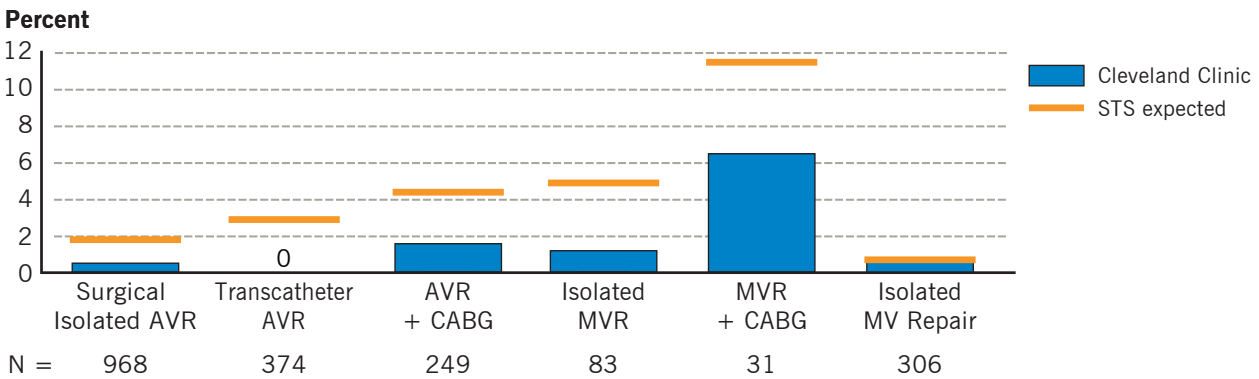
[a]Includes microadenoma and macroadenoma

[b]Includes squamous cell carcinomas, small cell carcinomas, and blood dyscrasias

Valve Disease

In-Hospital Mortality by Procedure Type (N = 2011)

2016



AVR = aortic valve replacement, CABG = coronary artery bypass graft, MV = mitral valve, MVR = mitral valve replacement

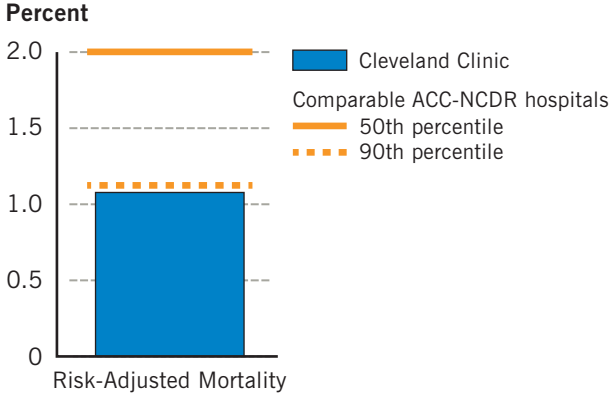
Cleveland Clinic surgeons performed a total of 3039 valve surgeries in 2016. However, the procedures included in this graph represent only those that are recognized by the Society of Thoracic Surgeons (STS). The mortality rates for valve surgery were lower than the STS-expected rates.

Source: Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database 2016

Ischemic Heart Disease – Interventional Treatment

In-Hospital Mortality (N = 1551)

2016



The rate of in-hospital mortality among patients who had percutaneous coronary intervention percutaneous coronary intervention (PCI) procedures at Cleveland Clinic in 2016 was lower than rates at comparable hospitals.

Source: ACC-NCDR database

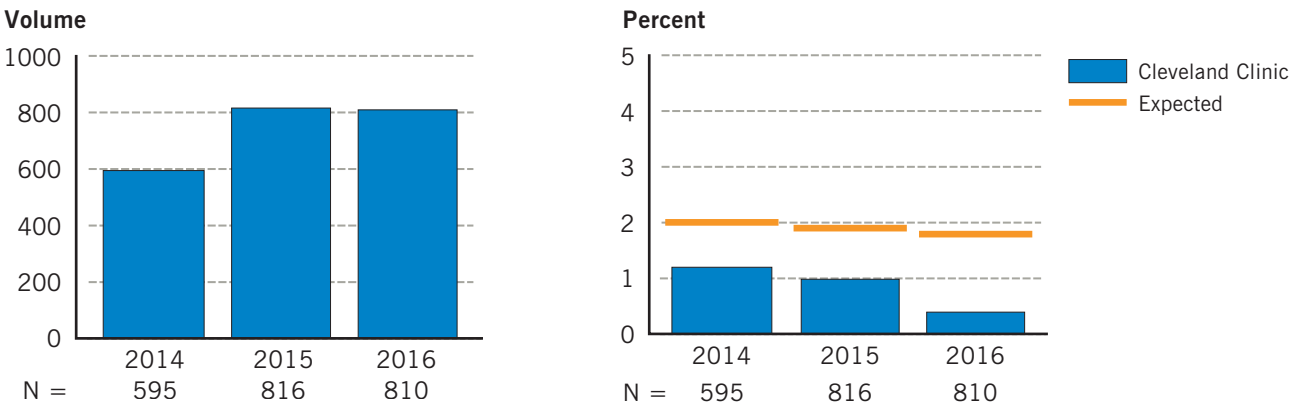
ACC-NCDR = American College of Cardiology National Cardiovascular Data Registry

Ischemic Heart Disease – Surgical Treatment – Isolated CABG Procedures

In-Hospital Mortality (N = 810)

2014 – 2016

Cleveland Clinic surgeons performed 810 isolated CABG procedures in 2016. The overall in-hospital mortality rate was 0.4%, which was lower than the expected rate of 1.8%.

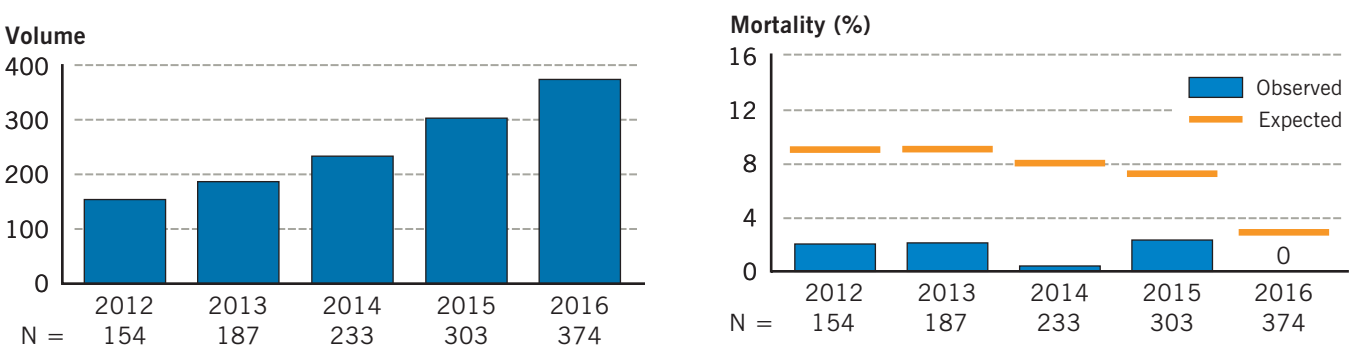


Transcatheter Aortic Valve Replacement

Cleveland Clinic is a national leader in the use of percutaneous treatment options for patients with valve disease.

Volume and In-Hospital Mortality (N = 374)

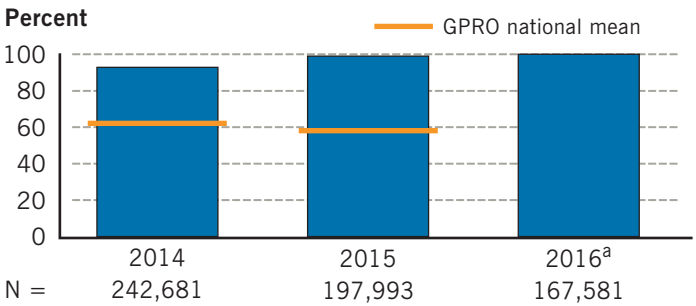
2012 – 2016



A total of 374 patients had transcatheter aortic valve replacement procedures at Cleveland Clinic in 2016. The in-hospital mortality rate was 0% compared with an expected rate of 2.9%. The 30-day mortality rate was 0.3% (N = 1).

ACO 21: Screening for High Blood Pressure

2014 – 2016

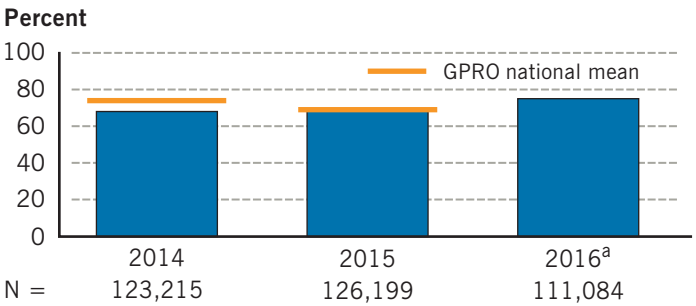


ACO = accountable care organization, GPRO = group practice reporting option

[a]GPRO national mean not available

ACO 28: Hypertension Control (< 140/90 mm Hg)

2014 – 2016

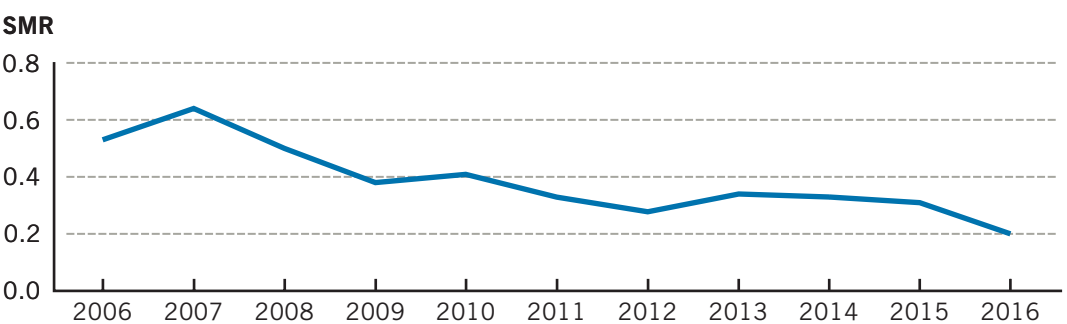


ACO = accountable care organization, GPRO = group practice reporting option

[a]GPRO national mean not available

Standardized Mortality Ratio (All Patients Admitted to Medicine Institute's Service)

2006 – 2016



SMR = standardized mortality ratio

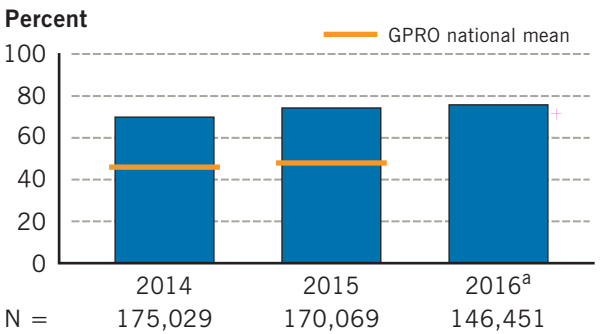
The standardized mortality ratio (SMR) is observed deaths/expected deaths (1.0 represents the average mortality rate; < 1.0 represents a better-than-expected mortality rate). SMR is a commonly used method of representing care and making data comparisons. The All Patient Refined Diagnosis Related Groups (APR DRG)[a] risk-adjustment method is used in this calculation to make effective comparisons. The institute's SMR remains well below expected. The population is defined as all patients admitted to the Medicine Institute's service.

[a]The 3M™ All Patient Refined Diagnosis Related Groups (APR DRG) Classification System is used for adjusting data for severity of illness and risk of mortality.

solutions.3m.com/wps/portal/3M/en_US/Health-Information-Systems/HIS/Products-and-Services/Products-List-A-Z/APR-DRG-Software

ACO 19: Colorectal Cancer Screening

2014 – 2016

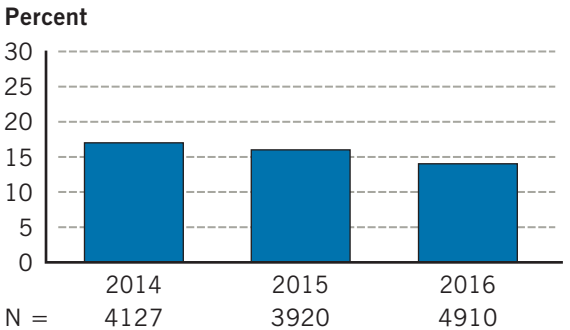


ACO = accountable care organization, GPRO = group practice reporting option

[a]GPRO national mean not available

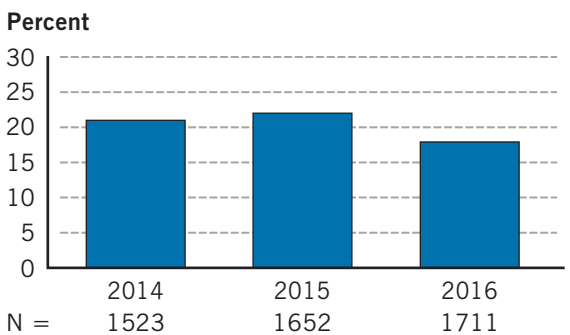
Thirty-Day All-Cause Readmission Rate for Patients Discharged to Home

2014 – 2016



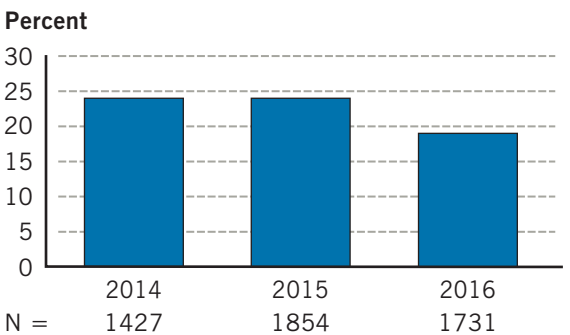
Thirty-Day All-Cause Readmission Rate for Patients Discharged to a Skilled Nursing Facility

2014 – 2016



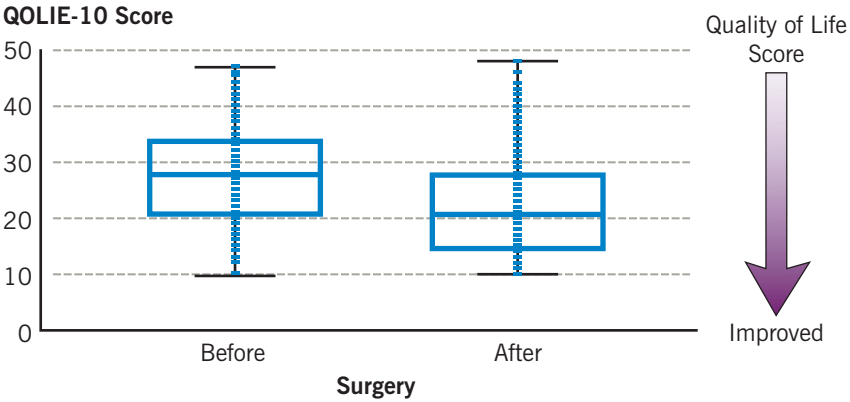
Thirty-Day All-Cause Readmission Rate for Patients Discharged to Home With Home Healthcare

2014 – 2016



Improvement in Quality of Life in Surgically Treated Patients (N = 461)

2007 – 2016



In surgically treated patients, the mean QOLIE-10 score improved from 27.9 at initial visit to 22.5 at last follow-up ($P < 0.0001$). N = patients with at least 6 months of follow-up. Mean duration of follow-up was 36.3 months. The standard box plots reflect the median and the 25th and 75th quartiles.

QOLIE-10 = Quality of Life in Epilepsy questionnaire

Clinically Meaningful Improvement in Quality of Life

2007 – 2016

	Patients Achieving Clinically Meaningful Improvement
Medically treated patients (N = 3810)	44%
Surgically treated patients (N = 461)	64%

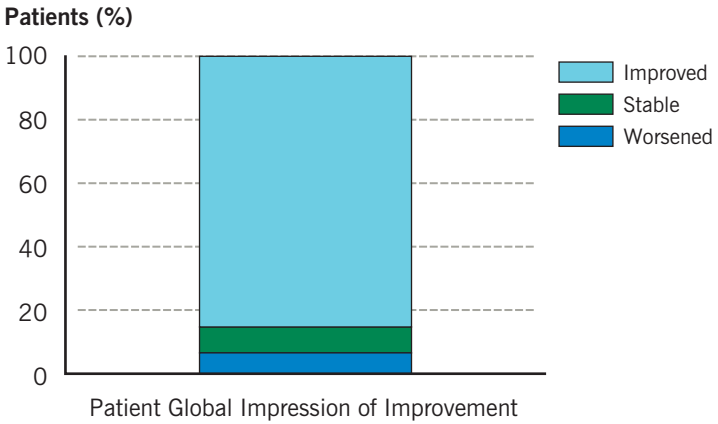
Clinically meaningful improvement in quality of life is defined as a drop of at least 10% in the baseline QOLIE-10 score.[1-3]

References

1. Cramer JA, Perrine K, Devinsky O, Meador K. A brief questionnaire to screen for quality of life in epilepsy: the QOLIE-10. *Epilepsia*. 1996 Jun;37(6):577-582.
2. Cramer JA, Arrigo C, Van Hammée G, Gauer LJ, Cereghino JJ. Effect of levetiracetam on epilepsy-related quality of life. N132 Study Group. *Epilepsia*. 2000 Jul;41(7):868-874.
3. Jehi L, Tesar G, Obuchowski N, Novak E, Najm I. Quality of life in 1931 adult patients with epilepsy: seizures do not tell the whole story. *Epilepsy Behav*. 2011 Dec;22(4):723-727.

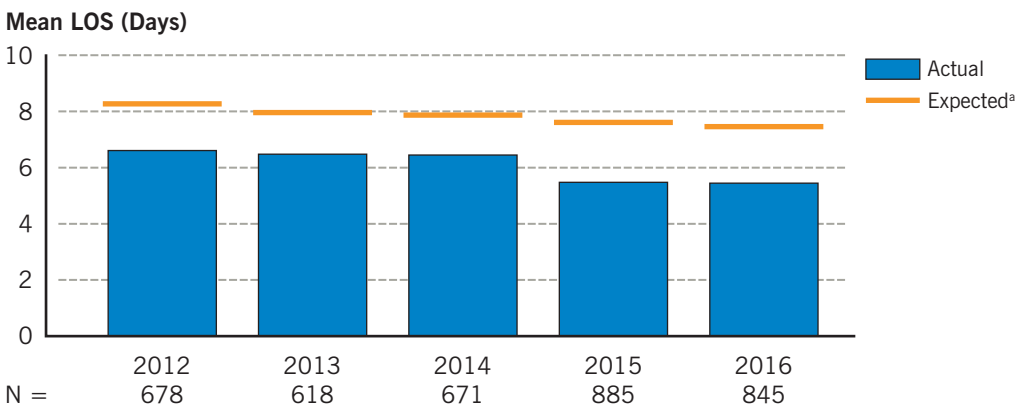
Improvement Following Deep Brain Stimulation Treatment for Parkinson Disease (N = 47)

2016



In 2016, 47 Parkinson disease patients completed the Patient Global Impression of Improvement (PGI-I) questionnaire after deep brain stimulation. Median duration of follow-up was 113 days (range, 43–271). At follow-up, 85% rated their condition as improved, compared with their condition before surgery.

Ischemic Stroke: Length of Stay



Actual mean length of stay is shorter than expected for patients treated for ischemic stroke at Cleveland Clinic.

LOS = length of stay

[a]The 3M™ All Patient Refined Diagnosis Related Groups (APR DRG) Classification System is used for adjusting data for severity of illness and risk of mortality. solutions.3m.com/wps/portal/3M/en_US/Health-Information-Systems/HIS/Products-and-Services/Products-List-A-Z/APR-DRG-Software.

IVF Cycle Outcomes With Frozen Embryo Transfers

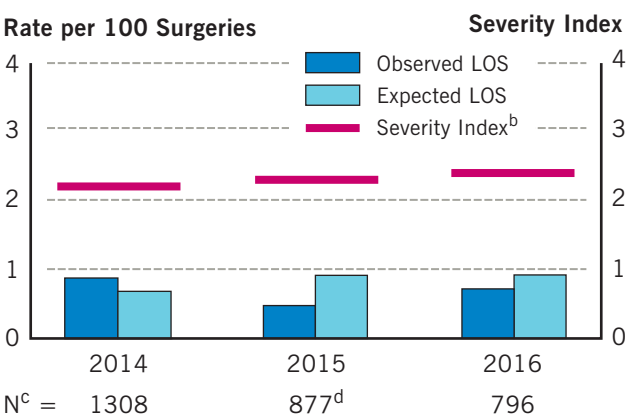
2016

Patient Age (Years)	< 38	≥ 38
Thaws	243	80
Transfers	238	76
Survival	94%	95%
Average embryos transferred	1.4	1.5
Implantation rate[a]	51%	38%
Clinical pregnancy rate[b]	**60%**	**53%**
Singleton pregnancies	65%	20%
Twin pregnancies	13%	2%
Triplet pregnancies	1%	0%

[a]Implantation rate per embryo transferred to the uterus
[b]Clinical pregnancy determined by presence of fetal heart on ultrasound

30-Day Mortality Rate[a] and Severity Index Following Inpatient Gynecologic Oncology Surgery (N = 2981)

2014 – 2016



[a]These data are prepared using the Vizient Clinical Database. Data from the Vizient Clinical Data Base/Resource Manager™ used by permission of Vizient. All rights reserved.

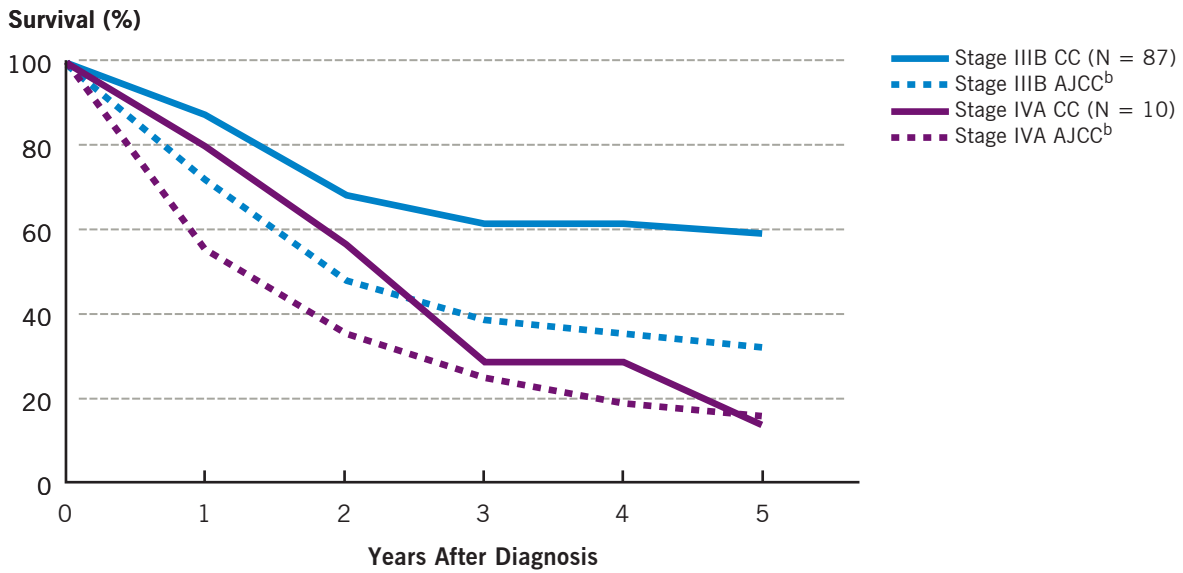
[b]The 3M™ All Patient Refined Diagnosis Related Groups (APR DRG) Classification System is used for adjusting data for severity of illness and risk of mortality. solutions.3m.com/wps/portal/3M/en_US/Health-Information-Systems/HIS/Products-and-Services/Products-List-A-Z/APR-DRG-Software

[c]Total number of surgical cases for gynecologic malignancy identified by MS-DRGs 734, 735, 736, 737, 738, 739, 740, 741, 754, 755, and 756.

[d]In 2015 and 2016, the number of inpatient admissions was reduced due to payer reclassification of the majority of major surgery admissions to outpatient status (less than a 2 midnight stay). Patients meeting criteria for inpatient admission had more complex surgeries and more comorbidities than patients meeting criteria for discharge at less than a 2 midnight stay.

Five-Year Overall Survival of Patients With Stage IIIB and IVA Cervical Cancer[a] (N = 97)

2007 – 2015



Number at Risk					
Stage IIIB	68	43	34	28	19
Stage IVA	8	4	2	2	1

AJCC = American Joint Committee on Cancer, CC = Cleveland Clinic

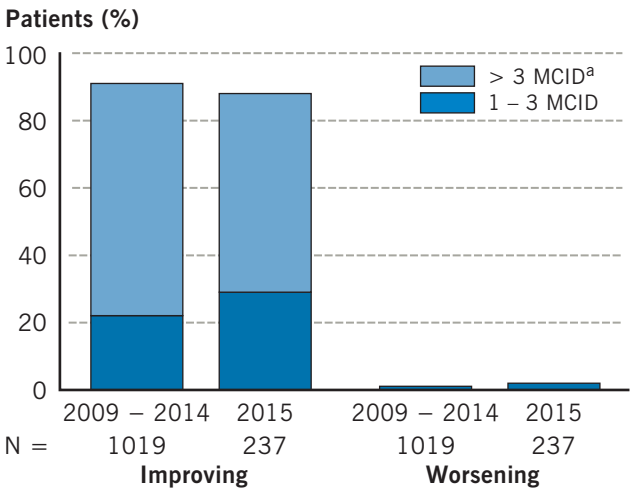
[a]Includes patients treated at main campus and Fairview Hospital, a Cleveland Clinic hospital

[b]Comparison group data from the National Cancer Data Base (Commission on Cancer of the American College of Surgeons and the American Cancer Society) 2000–2002, as reported in: Edge SB, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A. *AJCC Cancer Staging Manual*. 7th ed. New York, NY: Springer Science & Business Media; 2010.

Total Hip Arthroplasty for Osteoarthritis

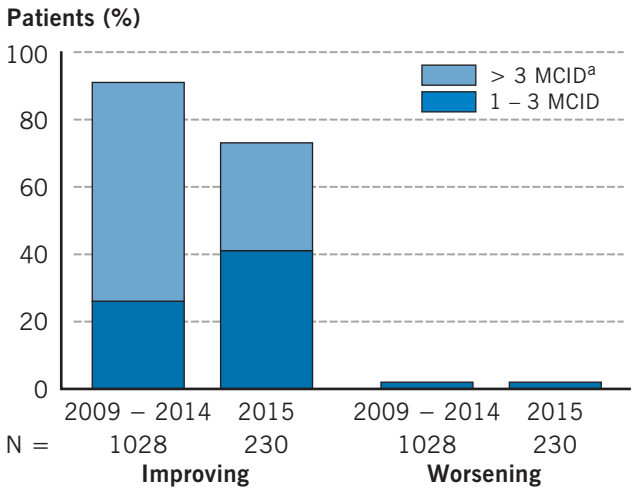
Hip-Related Pain 1 Year After Surgery

2009 – 2015



Hip-Related Function 1 Year After Surgery

2009 – 2015



[a]MCID refers to the "minimal clinically important difference" and is estimated here as one-half of the SD of patient-reported data 1 year after surgery. For hip-related pain, the MCID is 12.1 (N = 1455) on a scale from 0 (extreme pain) to 100 (no pain). For hip-related function, the MCID is 12.7 (N = 1452) on a scale from 0 (extreme limitations) to 100 (no limitations).

On average, 92% of patients reported a clinically important improvement in hip-related pain after 1 year, while 2% reported worsening (6% showed no detectable change in hip-related pain).

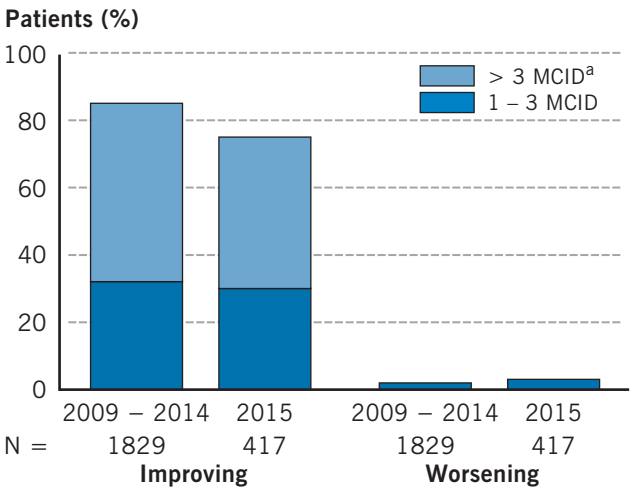
On average, 88% of patients reported a clinically important improvement in hip-related function after 1 year, while 2% reported worsening (10% showed no detectable change in hip-related function).

Hip-related pain and function are measured using a modified Hip dysfunction and Osteoarthritis Outcome Score (HOOS) questionnaire. Data are derived from patient self-reported scores collected at home and during office visits up to 6 months before and 1 year after surgeries performed during the indicated years.

Unilateral Total Knee Arthroplasty for Osteoarthritis

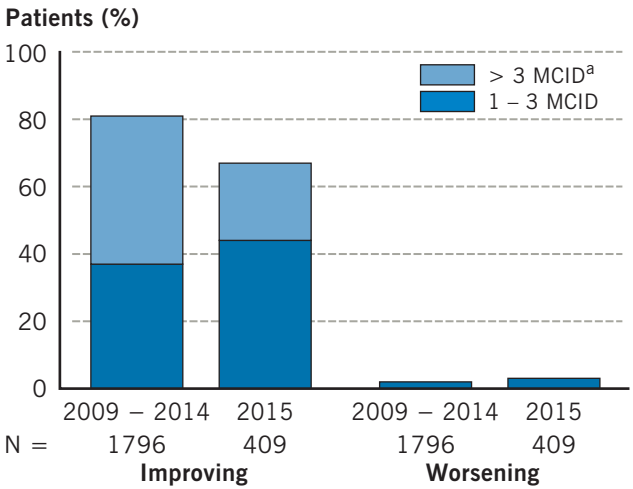
Knee-Related Pain 1 Year After Surgery

2009 – 2015



Knee-Related Function 1 Year After Surgery

2009 – 2015



[a]MCID refers to the "minimal clinically important difference" and is estimated here as one-half of the SD of patient-reported data 1 year after surgery. For knee-related pain, the MCID is 12.0 (N = 2561) on a scale from 0 (extreme pain) to 100 (no pain). For knee-related function, the MCID is 12.0 (N = 2511) on a scale from 0 (extreme limitations) to 100 (no limitations).

On average, 82% of patients reported a clinically important improvement in knee-related pain after 1 year, while 2% reported worsening (16% showed no detectable change in knee-related pain).

On average, 78% of patients reported a clinically important improvement in knee-related function after 1 year, while 3% reported worsening (19% showed no detectable change in knee-related function).

Knee-related pain and function are measured using a modified Knee injury and Osteoarthritis Outcome Score (KOOS) questionnaire. Data are derived from patient self-reported scores collected at home and during office visits up to 6 months before and 1 year after surgeries performed during the indicated years.

Pediatric Institute & Children's Hospital

Congenital heart disease affects an estimated 1 million people in America. Each year, approximately 1 in every 120 babies born in the US has a congenital heart defect. In some cases, the disease is life-threatening at birth. However, many people with a congenital heart condition do not know about it for years. Experts at Cleveland Clinic have extensive experience in the diagnosis and treatment of patients with all forms of congenital heart disease. The services of the Center for Pediatric and Adult Congenital Heart Disease are further enhanced by the Special Delivery Unit. The unit provides in utero diagnosis of complex heart conditions and immediate treatment after birth. Patients with more complex congenital heart disease who have surgery often require additional treatment or procedures throughout their lifetime and, therefore, need follow-up care from a team of experts in congenital heart disease. Cleveland Clinic Children's and Akron Children's Hospital have been collaborating since 2014 to provide the best care possible to patients with congenital heart disease.

Percutaneous Closure Procedures for Adult Congenital Heart Disease

Volume and Outcomes (N = 32)

2016

A total of 32 patients had percutaneous closure procedures at Cleveland Clinic in 2016. The success rate was 100%, and the mortality rate was 0% for both atrial septal defect and patent foramen ovale closures.

	N	Success	Mortality
Percutaneous ASD and PFO closures	32	100%	0%

ASD = atrial septal defect, PFO = patent foramen ovale

3-D Technology Advances Treatment for Complex Congenital Condition

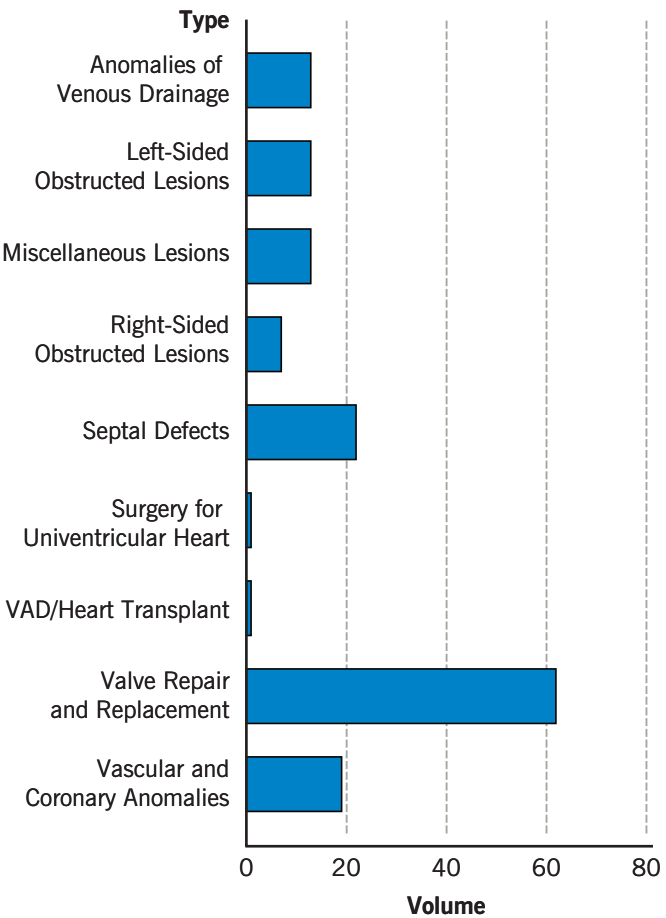
The use of 3-D printing technology is enabling the advancement of care. One such case involves a 3-D printed model of a 9-year-old patient's heart. The patient was born with heterotaxy syndrome, which is a rare condition that causes compromised heart function and blood oxygen levels. Two prior surgeries did not result in adequate treatment. However, the 3-D model allowed the surgical team to fully develop a plan to divide the complex heart into 4 chambers. The surgery was a success and resulted in improved heart function and normal blood oxygenation.

Adult Congenital Heart Surgery

Volume and Type (N = 151)

2016

Cleveland Clinic cardiac surgeons performed 151 open heart surgeries on patients with congenital cardiac disease. With advances in medical care and better long-term survival, the volume of these patients is increasing.

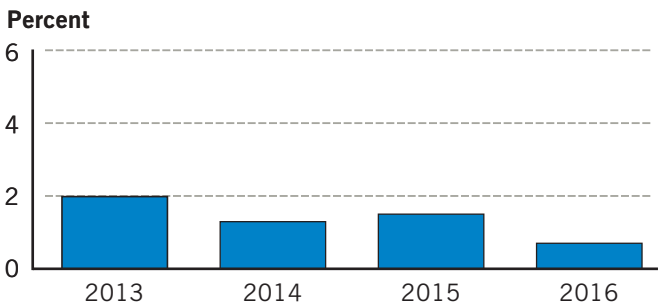


VAD = ventricular assist device

In-Hospital Mortality (N = 151)

2013 – 2016

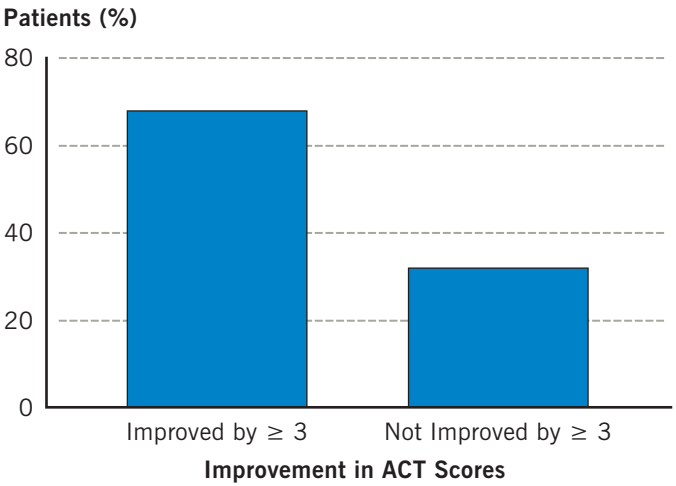
The in-hospital mortality rate for adult congenital heart surgery at Cleveland Clinic in 2016 was 0.7%. Many of these patients have very complex medical backgrounds and conditions and have had multiple surgeries.



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

Improvement in ACT Scores for Patients With Poorly or Not Well Controlled Asthma (N = 467)

2016



ACT = Asthma Control Test

Of 573 asthma patients who completed the ACT at initial and follow-up visits in 2016, 81.5% (467) were poorly or not well controlled at initial visit. Of these, 68% demonstrated an improvement in ACT scores of at least 3.

These data offer evidence that care at Cleveland Clinic's Asthma Center provides value and leads to improved asthma outcomes.[1]

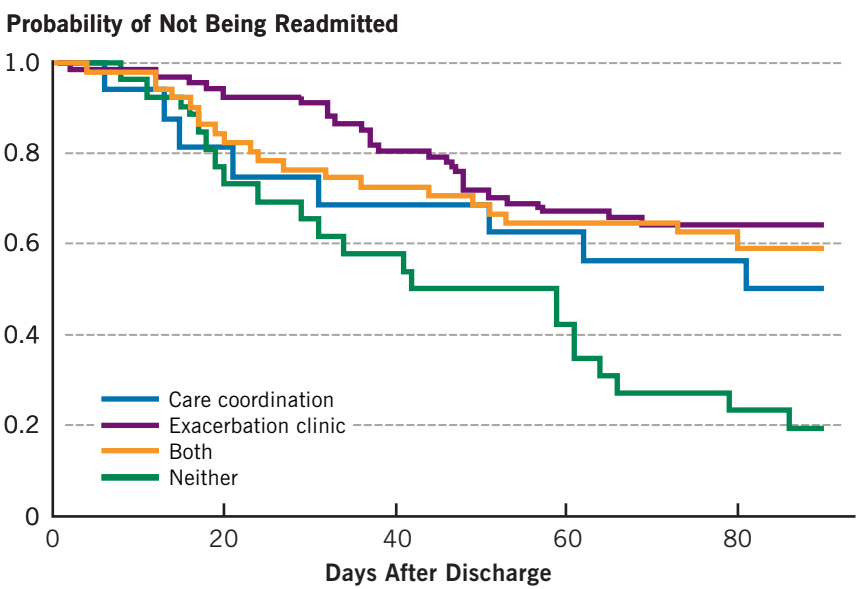
Reference

1. Williams SA, Wagner S, Kannan H, Bolge SC. The association between asthma control and health care utilization, work productivity loss and health-related quality of life. *J Occup Environ Med*. 2009 Jul;51(7):780-785.

The Center for Comprehensive Care in Chronic Obstructive Pulmonary Disease (COPD Center) was established to provide comprehensive, multidisciplinary care to COPD patients evaluated and managed at Cleveland Clinic's Respiratory Institute. In addition to optimizing medical management, COPD Center physicians have extensive experience in assessing patients for advanced surgical procedures such as lung volume reduction surgery and lung transplantation. The COPD Center maintains a referral clinic and integrated disease management program, which consists of a COPD exacerbation clinic (for early follow-up of those patients recently discharged from the hospital) and a care coordination program that provides telephonic follow-up.

Outcomes for Different Components of the COPD Integrated Disease Management Program (N = 160)

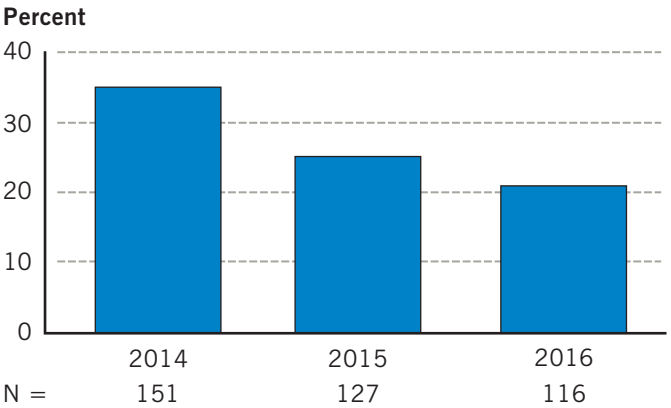
April 2014 – May 2015



Between April 2014 and May 2015, 160 patients recently discharged after hospitalization for COPD exacerbation were referred to the integrated disease management program. The 90-day readmission rate was 35.8% for patients who attended the exacerbation clinic (N = 67), 50% for those who received care coordination (N = 16), 41.2% for those who received both (N = 51), and 80.8% for those who received neither (N = 26). Receiving either or both components of the program reduced the likelihood of 90-day readmissions compared with receiving no intervention.

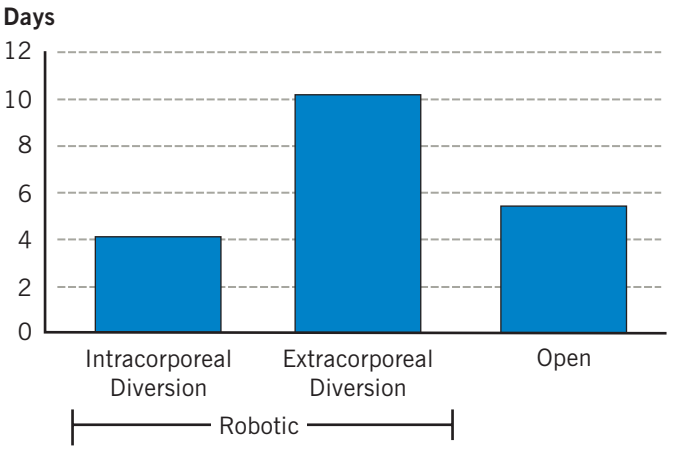
Decline in Cystectomy Readmissions

2014 – 2016



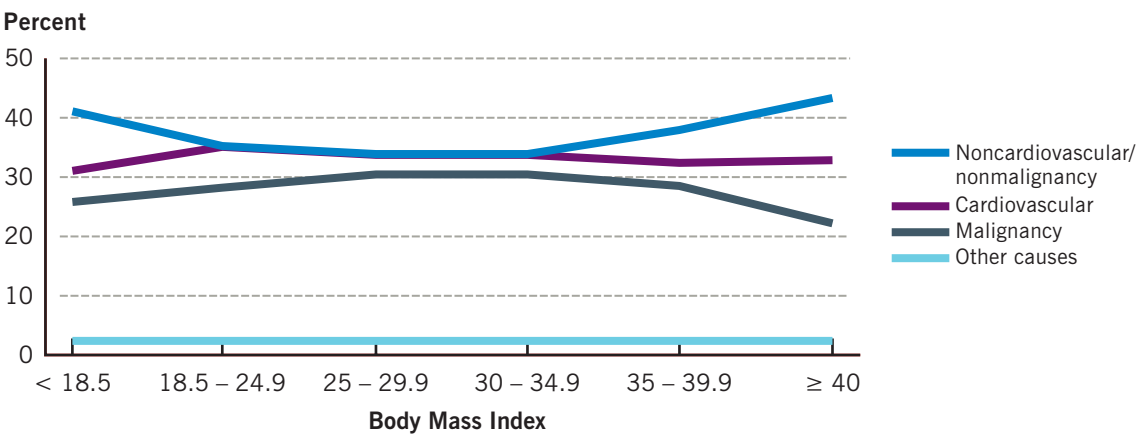
Cystectomy Length of Stay (N = 41)

August 2016 – December 2016



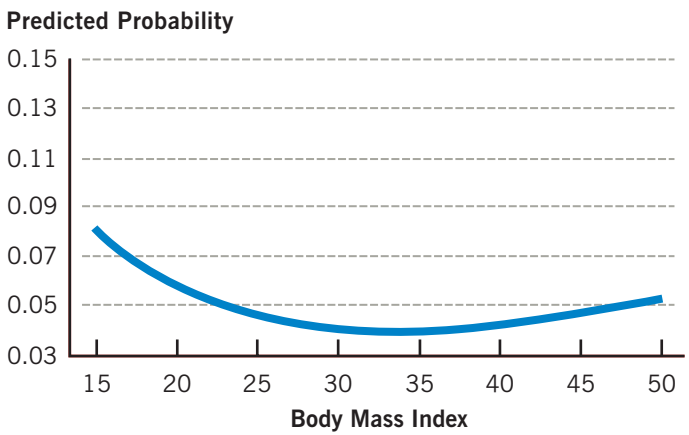
Causes of Death Across Body Mass Index Categories in Chronic Kidney Disease (N = 14,518)

2005 – 2012

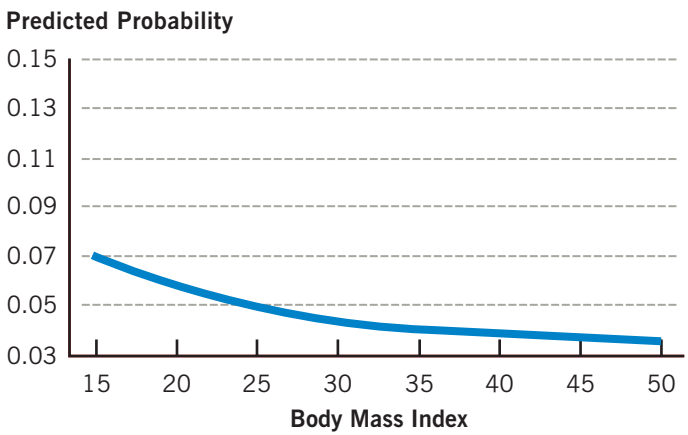


Predicted Mortality From Competing Risk Models at 4 Years Based on Body Mass Index in Chronic Kidney Disease (N = 14,518)

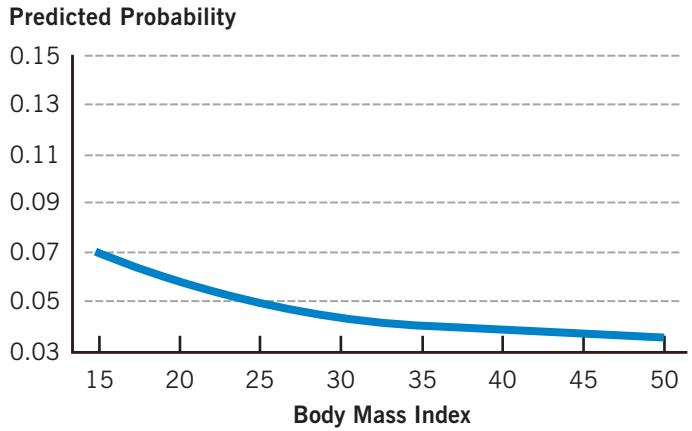
Cardiovascular Death



Malignancy Death



Noncardiovascular/Nonmalignancy Death



About Cleveland Clinic

Overview

Cleveland Clinic is an academic medical center offering patient care services supported by research and education in a nonprofit group practice setting. More than 3500 Cleveland Clinic staff physicians and scientists in 140 medical specialties and subspecialties care for more than 7.1 million patients across the system annually, performing nearly 208,000 surgeries and conducting more than 652,000 emergency department visits. Patients come to Cleveland Clinic from all 50 states and 185 nations. Cleveland Clinic's CMS case-mix index is the second-highest in the nation.

Cleveland Clinic is an integrated healthcare delivery system with local, national, and international reach. The main campus in midtown Cleveland, Ohio, has a 1400-bed hospital, outpatient clinic, specialty institutes, labs, classrooms, and research facilities in 44 buildings on 167 acres. Cleveland Clinic has more than 150 northern Ohio outpatient locations, including 10 regional hospitals, 18 full-service family health centers, 3 health and wellness centers, an affiliate hospital, and a rehabilitation hospital for children. Cleveland Clinic also includes Cleveland Clinic Florida; Cleveland Clinic Nevada; Cleveland Clinic Canada; Cleveland Clinic Abu Dhabi, UAE; Sheikh Khalifa Medical City (management contract), UAE; and Cleveland Clinic London (opening in 2020). Cleveland Clinic is the largest employer in Ohio, with more than 51,000 employees. It generates $12.6 billion of economic activity a year.

Cleveland Clinic supports physician education, training, consulting, and patient services around the world through representatives in the Dominican Republic, Guatemala, India, Panama, Peru, Saudi Arabia, and the United Arab Emirates. Dedicated Global Patient Services offices are located at Cleveland Clinic's main campus, Cleveland Clinic Abu Dhabi, Cleveland Clinic Canada, and Cleveland Clinic Florida.

The Cleveland Clinic Model

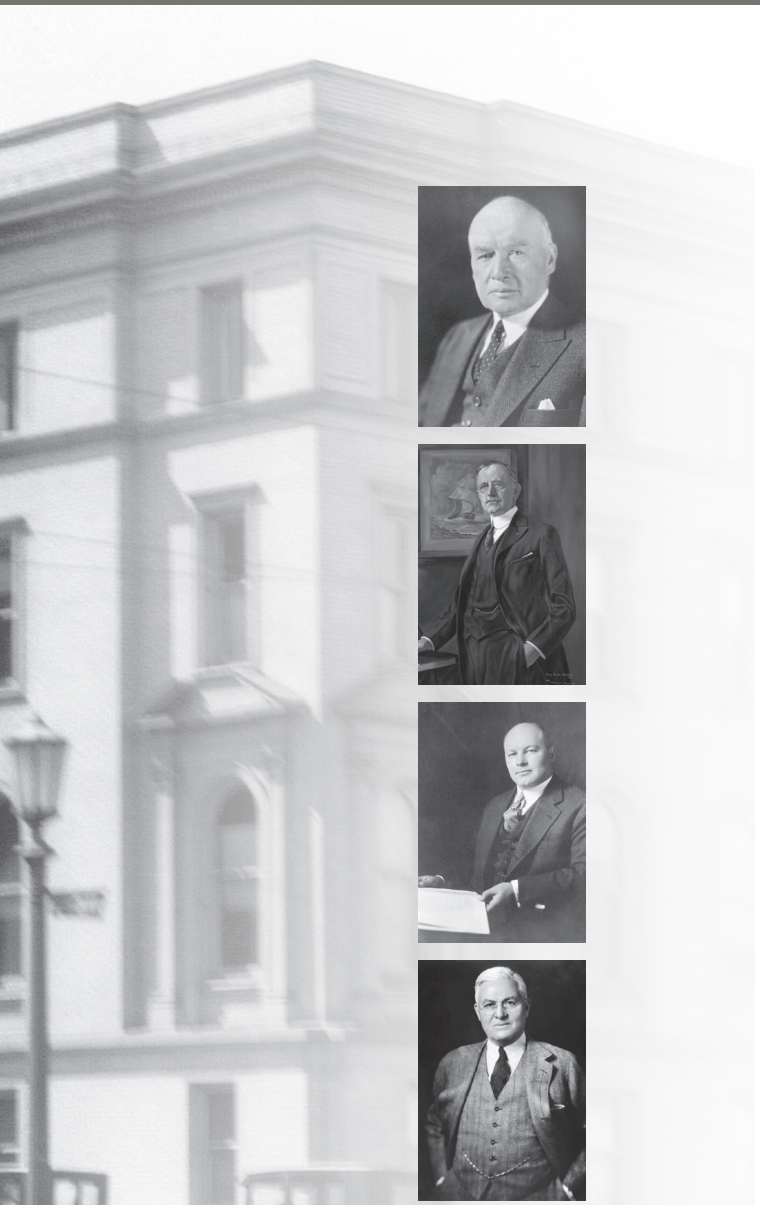
Cleveland Clinic was founded in 1921 by 4 physicians who had served in World War I and hoped to replicate the organizational efficiency of military medicine. The organization has grown through the years by adhering to the nonprofit, multispecialty group practice they established. All Cleveland Clinic staff physicians receive a straight salary with no bonuses or other financial incentives. The hospital and physicians share a financial interest in controlling costs, and profits are reinvested in research and education.

Cleveland Clinic Florida was established in 1987. Cleveland Clinic began opening family health centers in surrounding communities in the 1990s. Marymount Hospital joined Cleveland Clinic in 1995, followed by regional hospitals including Euclid Hospital, Fairview Hospital, Hillcrest Hospital, Lutheran Hospital, Medina Hospital, South Pointe Hospital, and affiliate Ashtabula County Medical Center. In 2015, the Akron General Health System joined the Cleveland Clinic health system.

Internally, Cleveland Clinic services are organized into patient-centered integrated practice units called institutes, each institute combining medical and surgical care for a specific disease or body system. Cleveland Clinic was among the first academic medical centers to establish an Office of Patient Experience, to promote comfort, courtesy, and empathy across all patient care services.

A Clinically Integrated Network

Cleveland Clinic is committed to providing value-based care, and it has grown the Cleveland Clinic Quality Alliance into the nation's second-largest, and northeast Ohio's largest, clinically integrated network. The network comprises more than 6300 physician members, including both Cleveland Clinic staff and independent physicians from the community. Led by its physician members, the Quality Alliance strives to improve quality and consistency of care; reduce costs and increase efficiency; and provide access to expertise, data, and experience.



Cleveland Clinic Lerner College of Medicine

Lerner College of Medicine is known for its small class sizes, unique curriculum, and full-tuition scholarships for all students. Each new class accepts 32 students who are preparing to be physician investigators. In 2015, Cleveland Clinic broke ground on a 477,000-square-foot multidisciplinary Health Education Campus. The campus, which will open in July 2019, will serve as the new home of the Case Western Reserve University (CWRU) School of Medicine and Cleveland Clinic's Lerner College of Medicine, as well as the CWRU School of Dental Medicine, the Frances Payne Bolton School of Nursing, and physician assistant and allied health training programs.

Graduate Medical Education

In 2016, nearly 2000 residents and fellows trained at Cleveland Clinic and Cleveland Clinic Florida in our continually growing programs.

U.S. News & World Report Ranking

Cleveland Clinic is ranked the No. 2 hospital in America by *U.S. News & World Report* (2016). It has ranked No. 1 in heart care and heart surgery since 1995. In 2016, 3 of its programs were ranked No. 2 in the nation: gastroenterology and GI surgery, nephrology, and urology. Ranked among the nation's top five were gynecology, orthopaedics, rheumatology, pulmonology, and diabetes and endocrinology.

Cleveland Clinic Physician Ratings

Cleveland Clinic believes in transparency and in the positive influence of the physician-patient relationship on healthcare outcomes. To continue to meet the highest standards of patient satisfaction, Cleveland Clinic physician ratings, based on nationally recognized Press Ganey patient satisfaction surveys, are published online at clevelandclinic.org/staff.

Resources

Referring Physician Center and Hotline

Call us 24/7 for access to medical services or to schedule patient appointments at 855.REFER.123 (855.733.3712), email refdr@ccf.org, or go to clevelandclinic.org/Refer123. The free Cleveland Clinic Physician Referral App, available for mobile devices, gives you 1-click access. Available in the App Store or Google Play.

Remote Consults

Anybody anywhere can get an online second opinion from a Cleveland Clinic specialist through our MyConsult service. For more information, go to clevelandclinic.org/myconsult, email myconsult@ccf.org, or call 800.223.2273, ext. 43223.

Request Medical Records

216.444.2640 or 800.223.2273, ext. 42640

Track Your Patients' Care Online

Cleveland Clinic offers an array of secure online services that allow referring physicians to monitor their patients' treatment while under Cleveland Clinic care and gives them access to test results, medications, and treatment plans. my.clevelandclinic.org/online-services

Dr**Connect** (online access to patients' treatment progress while under referred care): call 877.224.7367, email drconnect@ccf.org, or visit clevelandclinic.org/drconnect.

MyPractice Community (affordable electronic medical records system for physicians in private practice): 216.448.4617.

eRadiology (teleradiology consultation provided nationwide by board-certified radiologists with specialty training, within 24 hours or stat): call 216.986.2915 or email starimaging@ccf.org.

Medical Records Online

Patients can view portions of their medical record, receive diagnostic images and test results, make appointments, and renew prescriptions through My**Chart**, a secure online portal. All new Cleveland Clinic patients are automatically registered for My**Chart**. clevelandclinic.org/mychart

Access

Cleveland Clinic is committed to convenient access, offering virtual visits, shared medical appointments, and walk-in urgent care for your patients. clevelandclinic.org/access

Critical Care Transport Worldwide

Cleveland Clinic's fleet of ground and air transport vehicles is ready to transfer patients at any level of acuity anywhere on Earth. Specially trained crews provide Cleveland Clinic care protocols from first contact. To arrange a transfer for STEMI (ST-elevation myocardial infarction), acute stroke, ICH (intracerebral hemorrhage), SAH (subarachnoid hemorrhage), or aortic syndrome, call 877.379.CODE (2633). For all other critical care transfers, call 216.444.8302 or 800.553.5056.

CME Opportunities: Live and Online

Cleveland Clinic's Center for Continuing Education operates the largest CME program in the country. Live courses are offered in Cleveland and cities around the nation and the world. The center's website (ccfcme.org) is an educational resource for healthcare providers and the public. It has a calendar of upcoming courses, online programs on topics in 30 areas, and the award-winning virtual textbook of medicine, The Disease Management Project.

Clinical Trials

Cleveland Clinic is running more than 2200 clinical trials at any given time for conditions including breast and liver cancer, coronary artery disease, heart failure, epilepsy, Parkinson disease, chronic obstructive pulmonary disease, asthma, high blood pressure, diabetes, depression, and eating disorders. Cancer Clinical Trials is a mobile app that provides information on the more than 200 active clinical trials available to cancer patients at Cleveland Clinic. clevelandclinic.org/cancertrialapp

Healthcare Executive Education

Cleveland Clinic has programs to share its expertise in operating a successful major medical center. The Executive Visitors' Program is an intensive, 3-day behind-the-scenes view of the Cleveland Clinic organization for the busy executive. The Samson Global Leadership Academy is a 2-week immersion in challenges of leadership, management, and innovation taught by Cleveland Clinic leaders, administrators, and clinicians. Curriculum includes coaching and a personalized 3-year leadership development plan.
clevelandclinic.org/executiveeducation

Consult QD Physician Blog

A website from Cleveland Clinic for physicians and healthcare professionals. Discover the latest research insights, innovations, treatment trends, and more for all specialties. consultqd.clevelandclinic.org

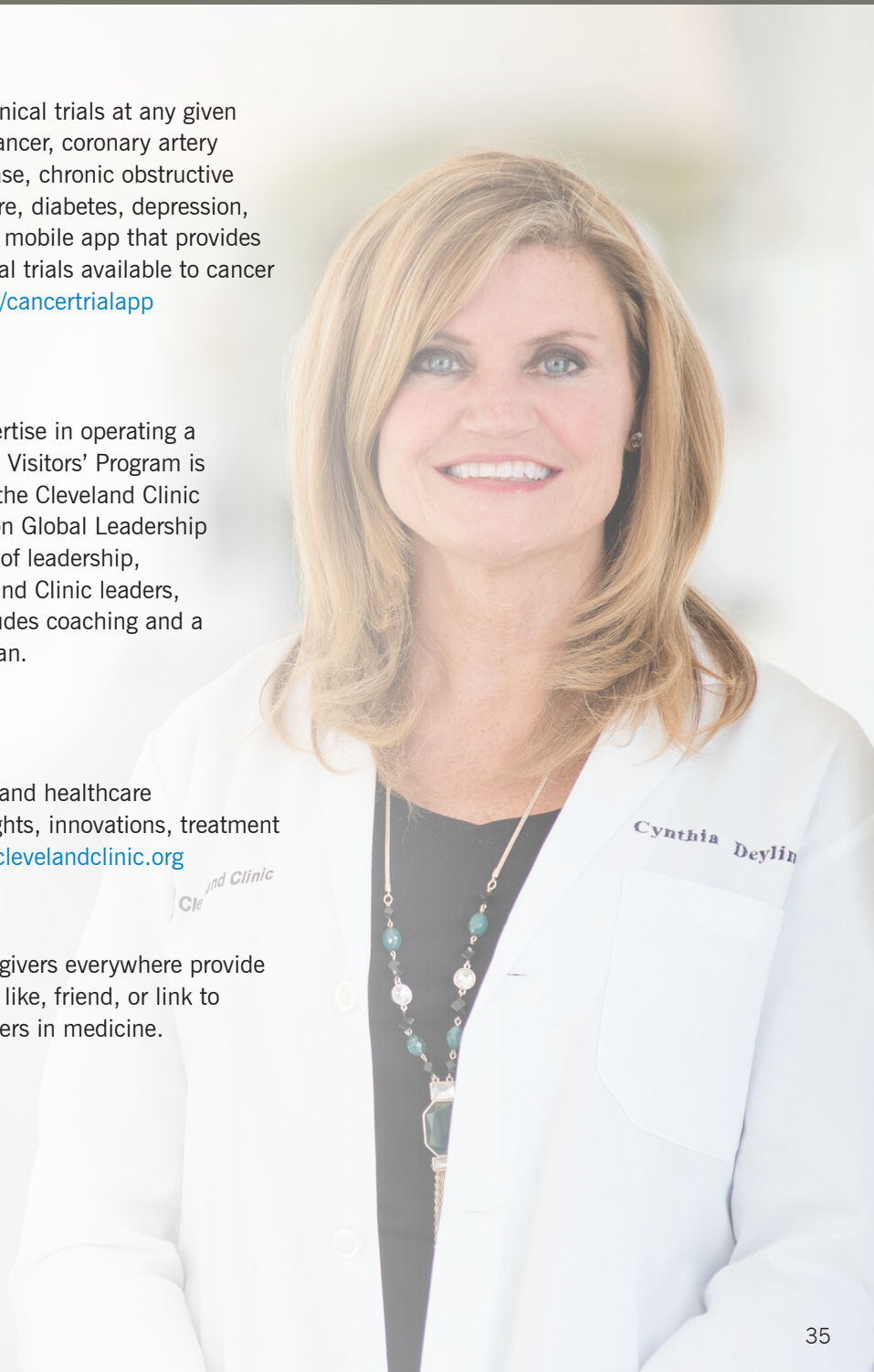
Social Media

Cleveland Clinic uses social media to help caregivers everywhere provide better patient care. Millions of people currently like, friend, or link to Cleveland Clinic social media — including leaders in medicine.

Facebook for Medical Professionals
facebook.com/CMEclevelandclinic

Follow us on Twitter
@cleclinicMD

Connect with us on LinkedIn
clevelandclinic.org/MDlinkedin



Contact Information

Cleveland Clinic Main Campus

9500 Euclid Ave.

Cleveland, OH 44195

General Patient Referral

24/7 hospital transfers or physician consults

800.553.5056

General Information

216.444.2200

Hospital Patient Information

216.444.2000

General Patient Appointments

216.444.2273 or 800.223.2273

Referring Physician Center and Hotline

855.REFER.123 (855.733.3712)

Or email refdr@ccf.org or visit clevelandclinic.org/refer123

Request for Medical Records

216.444.2640 or
800.223.2273, ext. 42640

Same-Day Appointments

216.444.CARE (2273)

Global Patient Services/ International Center

Complimentary assistance for international patients and families

001.216.444.8184 or visit
clevelandclinic.org/gps

Medical Concierge

Complimentary assistance for out-of-state patients and families

800.223.2273, ext. 55580, or
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