

**ADULT
CARDIAC
SURGERY**

**in
New York State**

2004 – 2006

Members of the New York State Cardiac Advisory Committee

Chair

Spencer King, M.D.
Executive Director of Academic Affairs
St. Joseph's Health System
Atlanta, GA

Vice Chair

Gary Walford, M.D.
Director, Cardiac Catheterization Laboratory
St. Joseph's Hospital
Syracuse, NY

Members

George Alfieris, M.D.
Associate Professor of Surgery
Strong Memorial Hospital, Rochester, NY
Chief of Pediatric Cardiopulmonary Surgery
SUNY-Upstate Medical University
Syracuse, NY

Frederick Bierman, M.D.
Director of Pediatric Cardiology
North Shore-LIJ Health System
New Hyde Park, NY

Alfred T. Culliford, M.D.
Professor of Clinical Surgery
NYU Medical Center
New York, NY

Michael H. Gewitz, M.D.
Chief, Pediatric Cardiology
Westchester Medical Center
Director of Pediatrics
New York Medical College
Valhalla, NY

Jeffrey P. Gold, M.D.
Provost and Executive VP for Health Affairs
Dean of the College of Medicine
The University of Toledo, Toledo, OH

Mary Hibberd, M.D.
Public Health Consultant

Robert Higgins, M.D.
Mary & John Bent Chairman
Professor of Surgery
Rush University
Chicago, IL

David R. Holmes Jr., M.D.
Professor of Medicine
Director, Cardiac Catheterization Laboratory
Mayo Clinic, Rochester, MN

Alice Jacobs, M.D.
Director, Cardiac Catheterization Laboratory
& Interventional Cardiology
Boston Medical Center
Boston, MA

Robert Jones, M.D.
Mary & Deryl Hart Professor of Surgery
Duke University Medical Center, Durham, NC

Desmond Jordan, M.D.
Associate Professor of Clinical Anesthesiology
in Biomedical Informatics
New York Presbyterian Hospital – Columbia
New York, NY

Thomas Kulik, M.D.
Director, Pulmonary Hypertension Program
Children's Hospital Boston
Boston, MA

Stephen Lahey, M.D.
Director, Cardiothoracic Surgery
Maimonides Medical Center
Brooklyn, NY

John J. Lamberti, Jr., M.D.
Director, Pediatric Cardiac Surgery
Children's Hospital of San Diego
San Diego, CA

Tia Powell, M.D.
Director, Montefiore-Einstein Center for Bioethics
Montefiore Medical Center
Bronx, NY

Samin K. Sharma, M.D.
Director, Cardiac Catheterization Laboratory
Mt. Sinai Hospital, New York, NY

Craig Smith, M.D.
Chief, Division of Cardiothoracic Surgery
New York Presbyterian Hospital - Columbia
New York, NY

Nicholas Stamato, M.D.
Director of Cardiology
United Health Services Hospitals
Johnson City, NY

Ferdinand Venditti, Jr., M.D.
Richard T. Beebe Professor and Chair, Dept. of Medicine
Albany Medical Center
Albany, NY

Deborah Whalen, R.N.C.S., M.B.A., A.N.P.
Clinical Service Manager
Division of Cardiology
Boston Medical Center
Boston, MA

Roberta Williams, M.D.
Vice President for Pediatrics and
Academic Affairs at Childrens Hospital - LA
Professor and Chair of Pediatrics at
Keck School of Medicine at USC
Los Angeles, CA

Consultant

Edward L. Hannan, Ph.D.
Distinguished Professor
Department of Health Policy,
Management & Behavior
Associate Dean for Research
University at Albany, School of Public Health

Program Adiminstrator

Paula M. Waselauskas, R.N., M.S.N.
Cardiac Services Program
NYS Department of Health

Cardiac Surgery Reporting System Subcommittee

Members & Consultants

Robert Jones, M.D. (Chair)

Mary & Deryl Hart Professor of Surgery
Duke University Medical Center

George Alfieris, M.D.

Associate Professor of Surgery
Strong Memorial Hospital
Chief of Pediatric Cardiopulmonary Surgery
SUNY-Health Science Center

Alfred T. Culliford, M.D.

Professor of Clinical Surgery
NYU Medical Center

Jeffrey P. Gold, M.D.

Provost and Executive VP for Health Affairs
Dean of the College of Medicine
The University of Toledo

Edward L. Hannan, Ph.D.

Distinguished Professor
Department of Health Policy,
Management & Behavior
Associate Dean for Research
University at Albany, School of Public Health

Robert Higgins, M.D.

Mary & John Bent Chairman
Professor of Surgery
Rush University

Desmond Jordan, M.D.

Associate Professor of Clinical Anesthesiology in Biomedical
Informatics
New York Presbyterian Hospital – Columbia

Stephen Lahey, M.D.

Director, Cardiothoracic Surgery
Maimonides Medical Center

Craig Smith, M.D.

Chief, Division of Cardiothoracic Surgery
New York Presbyterian Hospital - Columbia

Staff to CSRS Analysis Workgroup

Paula M. Waselauskas, R.N., M.S.N.

Administrator, Cardiac Services Program
New York State Department of Health

Kimberly S. Cozzens, M.A.

Cardiac Initiatives Research Manager
Cardiac Services Program

Taryn Cronise, M.A.

Clinical Data Coordinator
Cardiac Services Program

Karen C. Keller-Ullrich, R.N.

Clinical Investigator
Cardiac Services Program

Rosemary Lombardo, M.S.

CSRS Coordinator
Cardiac Services Program

Michael J. Racz, Ph.D.

Research Scientist
Department of Health Policy,
Management & Behavior
University at Albany, School of Public Health
Cardiac Services Program
New York State Department of Health

Zaza Samadashvili, M.D., M.P.H.

Sr. Research Support Specialist
Cardiac Services Program

TABLE OF CONTENTS

- INTRODUCTION 7
- CORONARY ARTERY BYPASS GRAFT SURGERY (CABG)..... 8
- CARDIAC VALVE PROCEDURES 8
- THE DEPARTMENT OF HEALTH PROGRAM 9
- PATIENT POPULATION 9
- RISK ADJUSTMENT FOR ASSESSING PROVIDER PERFORMANCE 9
 - Data Collection, Data Validation and Identifying Deaths 9
 - Assessing Patient Risk 10
 - Predicting Patient Mortality Rates for Providers 10
 - Computing the Risk-Adjusted Mortality Rate..... 10
 - Interpreting the Risk-Adjusted Mortality Rate 11
 - How This Initiative Contributes to Quality Improvement 11
- RESULTS 12
 - 2006 Risk Factors for CABG Surgery..... 12
 - Table 1 Multivariable Risk Factor Equation for CABG In-Hospital/30-Day Deaths in New York State in 2006 13
 - 2006 HOSPITAL OUTCOMES FOR CABG SURGERY FOR VALVE SURGERY 14
 - 2004-2006 HOSPITAL OUTCOMES FOR VALVE SURGERY 14
 - Table 2 In-Hospital/30-Day Observed, Expected and Risk-Adjusted Mortality Rates for Isolated CABG Surgery in New York State, 2006 Discharges..... 16
 - Figure 1 In-Hospital/30-Day Risk-Adjusted Mortality Rates for Isolated CABG in New York State, 2006 Discharges 17
 - Table 3 In-Hospital/30-Day Observed, Expected and Risk-Adjusted Mortality Rates for Valve or Valve/CABG Surgery in New York State, 2004-2006 Discharges..... 18
 - Figure 2 In-Hospital/30-Day Risk-Adjusted Mortality Rates for Valve or Valve/CABG Surgery in New York State, 2004-2006 Discharges..... 19
 - Table 4 Hospital Volume for Valve Procedures in New York State, 2004-2006 Discharges 20
 - 2004 – 2006 Hospital and Surgeon Outcomes 21
 - Table 5 In-Hospital/30-Day Observed, Expected, and Risk-Adjusted Mortality Rates by Surgeon for Isolated CABG and Valve Surgery (done in combination with or without CABG) in New York State, 2004-2006 Discharges..... 21
 - Table 6 Summary Information for Surgeons Practicing at More Than One Hospital, 2004-2006..... 30
- SURGEON AND HOSPITAL VOLUMES FOR TOTAL ADULT CARDIAC SURGERY, 2004-2006 34
 - Table 7 Surgeon and Hospital Volume for Isolated CABG, Valve or Valve/CABG, Other Cardiac Surgery and Total Adult Cardiac Surgery, 2004-2006..... 34

CRITERIA USED IN REPORTING SIGNIFICANT RISK FACTORS (2006) 43

MEDICAL TERMINOLOGY 44

APPENDIX 1 2004-2006 RISK FACTORS FOR ISOLATED CABG
IN-HOSPITAL/30-DAY MORTALITY 45

APPENDIX 2 2004-2006 RISK FACTORS FOR VALVE SURGERY
IN-HOSPITAL/30-DAY MORTALITY 47

APPENDIX 3 2004-2006 RISK FACTORS FOR VALVE AND
CABG SURGERY IN-HOSPITAL/30-DAY MORTALITY..... 49

NEW YORK STATE CARDIAC SURGERY CENTERS..... 51

INTRODUCTION

The information contained in this booklet is intended for health care providers, patients and families of patients who are considering cardiac surgery. It provides data on risk factors associated with death following coronary artery bypass graft surgery (CABG) and heart valve surgery and lists hospital and physician-specific mortality rates which have been risk-adjusted to account for differences in patient severity of illness.

New York State (NYS) has taken a leadership role in setting standards for cardiac services, monitoring outcomes and sharing performance data with patients, hospitals and physicians. Hospitals and doctors involved in cardiac care have worked in cooperation with the New York State Department of Health (Department of Health) and the New York State Cardiac Advisory Committee (Cardiac Advisory Committee) to compile accurate and meaningful data that can and have been used to enhance quality of care. We believe that this process has been instrumental in achieving the excellent outcomes that are evidenced in this report for centers across NYS.

We are pleased to be able to continue to provide expanded information in this year's report that encompasses outcomes for isolated CABG, valve surgery, and the two procedures done in combination. Isolated CABG represents the majority of adult cardiac surgeries performed, and we have reported risk-adjusted outcomes for that procedure for over 15 years. However, many additional patients undergo procedures each year to repair or replace heart valves or undergo valve surgery done in combination with CABG. This report provides important information on the risk factors and outcomes for both CABG and valve surgery. In addition, this report includes information on mortality outside the hospital but within 30 days following surgery. We believe this to be an important quality indicator that will provide useful information to patients and providers.

We encourage doctors to discuss this information with their patients and colleagues as they develop treatment plans. While these statistics are an important tool in making informed health care choices, individual treatment plans must be made by doctors and patients together after careful consideration of all pertinent factors. It is important to recognize that many factors can influence the outcome of cardiac surgery. These include the patient's health before the procedure, the skill of the operating team and general after-care. In addition, keep in mind that the information in this booklet does not include data after 2006. Important changes may have taken place in some hospitals during that time period.

In developing treatment plans, it is important that patients and physicians alike give careful consideration to the importance of healthy lifestyles for all those affected by heart disease. While some risk factors, such as heredity, gender and age cannot be controlled, others certainly can. Controllable risk factors that contribute to a higher likelihood of developing coronary artery disease are high cholesterol levels, cigarette smoking, high blood pressure, obesity and a lack of exercise. Limiting these risk factors after surgery will continue to be important in minimizing the occurrence of new blockages.

Providers of this State and the Cardiac Advisory Committee are to be commended for the excellent results that have been achieved through this cooperative quality improvement system. The Department of Health will continue to work in partnership with hospitals and physicians to ensure continued high-quality cardiac surgery is available to NYS residents.

CORONARY ARTERY BYPASS GRAFT SURGERY (CABG)

Heart disease is, by far, the leading cause of death in New York State, and the most common form of heart disease is atherosclerotic coronary artery disease. Different treatments are recommended for patients with coronary artery disease. For some people, changes in lifestyle, such as dietary changes, not smoking and regular exercise, can result in great improvements in health. In other cases, medication prescribed for high blood pressure or other conditions can make a significant difference.

Sometimes, however, an interventional procedure is recommended. The two common procedures performed on patients with coronary artery disease are CABG surgery and percutaneous coronary intervention (PCI).

CABG surgery is an operation in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart muscle, bypassing the arterial blockage. Typically, a section of one of the large (saphenous) veins in the leg, the radial artery in the arm or the mammary artery in the

chest is used to construct the bypass. One or more bypasses may be performed during a single operation, since providing several routes for the blood supply to travel is believed to improve long-term success for the procedure. Triple and quadruple bypasses are often done for this reason, not necessarily because the patient's condition is more severe. CABG surgery is one of the most common, successful major operations currently performed in the United States.

As is true of all major surgery, risks must be considered. The patient is totally anesthetized and there is generally a substantial recovery period in the hospital followed by several weeks of recuperation at home. Even in successful cases, there is a risk of relapse causing the need for another operation.

Those who have CABG surgery are not cured of coronary artery disease; the disease can still occur in the grafted blood vessels or other coronary arteries. In order to minimize new blockages, patients should continue to reduce their risk factors for heart disease.

CARDIAC VALVE PROCEDURES

Heart valves control the flow of blood as it enters the heart and is pumped from the chambers of the heart to the lungs for oxygenation and back to the body. There are four valves: the tricuspid, mitral, pulmonic and aortic valves. Heart valve disease occurs when a valve cannot open all the way because of disease or injury, thus causing a decrease in blood flow to the next heart chamber. Another type of valve problem occurs when the valve does not close completely, which leads to blood leaking backwards into the previous chamber. Either of these problems causes the heart to work harder to pump blood or causes blood to back up in the lungs or lower body.

When a valve is stenotic (too narrow to allow enough blood to flow through the valve opening) or incompetent (cannot close tightly enough to prevent the backflow of blood), one of the treatment options is to repair the valve. Repair of a stenotic valve typically involves widening the valve opening, whereas repair of an incompetent valve is typically achieved by narrowing or tightening the supporting structures of the valve. The mitral valve is particularly amenable to valve repairs because its parts can frequently be repaired without having to be replaced.

In many cases, defective valves are replaced rather than repaired, using either a mechanical or biological valve. Mechanical valves are built using durable materials that generally last a lifetime. Biological valves are made from tissue taken from pigs, cows or humans. Mechanical and biological valves each have advantages and disadvantages that can be discussed with referring physicians.

The most common heart valve surgeries involve the aortic and mitral valves. Patients undergoing heart surgery are totally anesthetized and are usually placed on a heart-lung machine, whereby the heart is stopped for a short period of time using special drugs. As is the case for CABG surgery, there is a recovery period of several weeks at home after being discharged from the hospital. Some patients require replacement of more than one valve and some patients with both coronary artery disease and valve disease require valve replacement and CABG surgery. This report contains outcomes for the following valve procedures when done alone or in combination with CABG: Aortic Valve Replacement, Mitral Valve Repair, Mitral Valve Replacement and Multiple Valve Surgery.

THE HEALTH DEPARTMENT PROGRAM

The Department of Health has been studying the effects of patient and treatment characteristics (called risk factors) on outcomes for patients with heart disease for several years. Detailed statistical analyses of the information received from the study have been conducted under the guidance of the Cardiac Advisory Committee, a group of independent practicing cardiac surgeons, cardiologists and other professionals in related fields.

The results have been used to create a cardiac profile system which assesses the performance of hospitals and surgeons over time, independent of the severity of each individual patient's pre-operative conditions.

Designed to improve health in people with heart disease, this program is aimed at:

- understanding the health risks of patients which adversely affect how they will fare in coronary artery bypass surgery and/or valve surgery;
- improving the results of different treatments of heart disease;
- improving cardiac care;
- providing information to help patients make better decisions about their own care.

PATIENT POPULATION

This report is based on data for patients discharged between January 1, 2004, and December 31, 2006, provided by all non-federal hospitals in NYS where cardiac surgery is performed. Beginning with patients discharged in 2006, the Department of Health, with the advice of the Cardiac Advisory Committee, began a trial period of excluding from publicly-released reports any patients meeting the Cardiac Data System definition of pre-operative cardiogenic shock. Cardiogenic shock is a condition associated with severe hypotension (very low blood pressure); the technical definition used in this report can be found on page 43. Patients in cardiogenic shock are extremely high-risk, but for some, cardiac surgery may be their best chance for survival. Furthermore, the magnitude of the risk is not always easily determined using registry data. These cases were excluded after careful deliberation and input from NYS providers and others in an effort to assure that physicians could accept these cases where appropriate without concern over a detrimental impact on their reported outcomes.

Cases with shock were also excluded from the 2004 and 2005 data in the three-year analyses. This was

done to allow for accurate risk assessment across the entire time period. In total, 367 cases with cardiogenic shock were removed from 2004-2006 data. This accounts for 0.56 percent of all cardiac surgeries (CABG, valve surgery and other cardiac surgery reported in this data system) in the three years.

In addition, thirty-day follow-up for patients residing outside NYS is only available through December 31, 2006. Therefore, 78 records corresponding to patients residing outside NYS undergoing surgery in December of 2006 were excluded from analysis because these patients could not be followed for 30 days.

Isolated CABG surgery represented 57.57 percent of all adult cardiac surgery for the three-year period covered by this report. Valve or combined valve/CABG surgery represented 32.10 percent of all adult cardiac surgery for the same three year period. Total cardiac surgery, isolated CABG, valve or valve/CABG surgery and other cardiac surgery volumes are tabulated in Table 7 by hospital and surgeon for the period 2004 through 2006.

RISK ADJUSTMENT FOR ASSESSING PROVIDER PERFORMANCE

Provider performance is directly related to patient outcomes. Whether patients recover quickly, experience complications or die following a procedure is in part a result of the kind of medical care they receive. It is difficult, however, to compare outcomes across hospitals when assessing provider performance,

because different hospitals treat different types of patients. Hospitals with sicker patients may have higher rates of complications and death than other hospitals in the State. The following describes how the Department of Health adjusts for patient risk in assessing provider outcomes.

Data Collection, Data Validation and Identifying In-Hospital/30-Day Deaths

As part of the risk-adjustment process, NYS hospitals where cardiac surgery is performed provide information to the Department of Health for each patient undergoing that procedure. Cardiac surgery departments collect data concerning patients' demographic and clinical characteristics. Approximately 40 of these characteristics (called risk factors) are collected for each patient. Along with information about the procedure, physician and the patient's status at discharge, these data are entered into a computer and sent to the Department of Health for analysis.

Data are verified through review of unusual reporting frequencies, cross-matching of cardiac surgery data with other Department of Health databases and a review of medical records for a selected sample of cases. These activities are extremely helpful in ensuring consistent interpretation of data elements across hospitals.

The analyses in this report base mortality on deaths occurring during the same hospital stay in which a patient underwent cardiac surgery and on deaths that occur after discharge but within 30 days of surgery.

An in-hospital death is defined as a patient who died subsequent to CABG or valve surgery during the same admission or was discharged to hospice care and expired within 30 days.

Deaths that occur after hospital discharge but within 30 days of surgery are also counted in the risk-adjusted mortality analyses. This is done because hospital length of stay has been decreasing and in the opinion of the Cardiac Advisory Committee most deaths that occur after hospital discharge but within 30 days of surgery are related to complications of surgery.

Data on deaths occurring after discharge from the hospital are made available by the National Center for Health Statistics, the Department of Health and the Bureau of Vital Statistics, New York City Department of Health and Mental Hygiene.

Assessing Patient Risk

Each person who develops heart disease has a unique health history. A cardiac profile system has been developed to evaluate the risk of treatment for each individual patient based on his or her history, weighing the important health factors for that person based on the experiences of thousands of patients who have undergone the same procedures in recent years. All

important risk factors for each patient are combined to create a risk profile. For example, an 80-year-old patient with a history of a previous open heart surgery has a very different risk profile than a 40-year-old with no previous open heart surgery.

The statistical analyses conducted by the Department of Health consist of determining which of the risk factors collected are significantly related to death following CABG and/or valve surgery and determining how to weight the significant risk factors to predict the chance each patient will have of dying, given his or her specific characteristics.

Doctors and patients should review individual risk profiles together. Treatment decisions must be made by doctors and patients together after consideration of all the information.

Predicting Patient Mortality Rates for Providers

The statistical methods used to predict mortality on the basis of the significant risk factors are tested to determine if they are sufficiently accurate in predicting mortality for patients who are extremely ill prior to undergoing the procedure as well as for patients who are relatively healthy. These tests have confirmed that the models are reasonably accurate in predicting how patients of all different risk levels will fare when undergoing cardiac surgery.

The mortality rate for each hospital and surgeon is also predicted using the relevant statistical models. This is accomplished by summing the predicted probabilities of death for each of the provider's patients and dividing by the number of patients. The resulting rate is an estimate of what the provider's mortality rate would have been if the provider's performance were identical to the State performance. The percentage is called the predicted or expected mortality rate (EMR). A hospital's EMR is contrasted with its observed mortality rate (OMR), which is the number of patients who died divided by the total number of patients.

Computing the Risk-Adjusted Mortality Rate

The risk-adjusted mortality rate (RAMR) represents the best estimate, based on the associated statistical model, of what the provider's mortality rate would have been if the provider had a mix of patients identical to the statewide mix. Thus, the RAMR has, to the extent possible, ironed out differences among providers in patient severity of illness, since it arrives at a mortality rate for each provider for an identical group of patients.

To get the RAMR, the OMR is first divided by the provider's EMR. If the resulting ratio is larger than one, the provider has a higher mortality rate than expected on the basis of its patient mix; if it is smaller than one, the provider has a lower mortality rate than expected from its patient mix. For isolated CABG patients the ratio is then multiplied by the overall statewide mortality rate of 1.92 percent (in-hospital/30-day mortality in 2006) to obtain the provider's RAMR. For the three year period 2004-2006, the ratio is multiplied by 2.01 percent (in-hospital/30-day mortality rate) for isolated CABG patients or 5.83 percent (in-hospital/30-day mortality rate) for valve or valve/CABG patients.

Interpreting the Risk-Adjusted Mortality Rate

If the RAMR is significantly lower than the statewide mortality rate, the provider has a significantly better performance than the State as a whole; if the RAMR is significantly higher than the statewide mortality rate, the provider has a significantly worse performance than the State as a whole.

The RAMR is used in this report as a measure of quality of care provided by hospitals and surgeons. However, there are reasons that a provider's RAMR may not be indicative of its true quality. For example, extreme outcome rates may occur due to chance alone. This is particularly true for low-volume providers, for whom very high or very low mortality rates are more likely to occur than for high-volume providers. To prevent misinterpretation of differences caused by chance variation, confidence intervals are reported in the results. The interpretations of those terms are provided later when the data are presented.

Differences in hospital coding of risk factors could be an additional reason that a provider's RAMR may not be reflective of quality of care. The Department of Health monitors the quality of coded data by reviewing samples of patients' medical records to ascertain the presence of key risk factors. When

significant coding problems have been discovered, hospitals have been required to correct these data and have been subjected to subsequent monitoring.

Although there are reasons that RAMRs presented here may not be a perfect reflection of quality of care, the Department of Health feels that this information is a valuable aid in choosing providers for cardiac surgery.

How This Initiative Contributes to Quality Improvement

The goal of the Department of Health and the Cardiac Advisory Committee is to improve the quality of care related to cardiac surgery in NYS. Providing the hospitals and cardiac surgeons in NYS with data about their own outcomes for these procedures allows them to examine the quality of the care they provide and to identify areas that need improvement.

The data collected and analyzed in this program are reviewed by the Cardiac Advisory Committee. Committee members assist with interpretation and advise the Department of Health regarding hospitals and surgeons that may need special attention. Committee members have also conducted site visits to particular hospitals and have recommended that some hospitals obtain the expertise of outside consultants to design improvements for their programs.

The overall results of this program of ongoing review show that significant progress is being made. In response to the program's results for surgery, facilities have refined patient criteria, evaluated patients more closely for pre-operative risks and directed them to the appropriate surgeon. More importantly, many hospitals have identified medical care process problems that have led to less than optimal outcomes and have altered those processes to achieve improved results.

RESULTS

2006 Risk Factors for CABG Surgery

The significant pre-operative risk factors for death in the hospital during the same admission as the surgery or after hospital discharge but within 30 days of surgery (in-hospital/30-day mortality) for CABG in 2006 are presented in Table 1.

Roughly speaking, the odds ratio for a risk factor represents the number of times a patient with that risk factor is more likely to die in the hospital during or after CABG or after discharge but within 30 days of the surgery than a patient without the risk factor, all other risk factors being the same. For example, the odds ratio for the risk factor COPD is 1.814. This means that a patient who has COPD prior to surgery is approximately 1.814 times as likely to die in the hospital or after discharge within 30 days of surgery as a patient who does not have COPD but who has the same other significant risk factors.

For some of the risk factors in the table, there are only two possibilities: having the risk factor and not having it. For example, a patient either has COPD or does not have COPD. Exceptions are: Age – Number of Years Greater than 55, Ejection Fraction (which is a measure of the heart's ability to pump blood), Previous MI, and Renal Failure.

For age, the odds ratio roughly represents the number of times a patient who is older than 55 is more likely to die in the hospital or after discharge but within 30 days than a patient who is one year younger. Thus, a

patient undergoing CABG who is 56 years old has a chance of dying that is approximately 1.051 times the chance that a patient 55 years old undergoing CABG has of in-hospital/30-day mortality, if all other risk factors are the same. All patients age 55 and younger have roughly the same odds of dying in the hospital or after discharge but within 30 days if their other risk factors are identical.

The odds ratios for the categories for Ejection Fraction are relative to the reference category (50 percent and higher). Thus, patients with an ejection fraction of less than 20 percent have odds of in-hospital/30-day mortality that are 6.477 times the odds of a person with an ejection fraction of 50 percent or higher, all other risk factors being the same.

Previous MI is subdivided into five groups: occurring less than six hours prior to surgery, six to twenty-three hours prior, one to seven days prior, eight to twenty days prior and no MI within twenty days prior to surgery. The last group is referred to as the reference category. The odds ratios for the Previous MI categories are relative to patients who have not had an MI within 20 days prior to the procedure.

Since Renal Failure is expressed in terms of renal failure with dialysis and elevated creatinine without dialysis, the odds ratios for all Renal Failure categories are relative to patients with no dialysis and no creatinine greater than 1.6 mg/dL prior to surgery.

Table 1: Multivariable Risk Factor Equation for CABG In-Hospital/30-Day Deaths in New York State in 2006.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 55	—	0.0502	<.0001	1.051
Female Gender	26.14	0.6348	<.0001	1.887
Hemodynamic State				
Unstable	1.51	0.8260	0.0102	2.284
Ventricular Function				
Ejection Fraction				
Ejection Fraction \geq 50%	59.97	---Reference---		1.000
Ejection Fraction < 20%	1.67	1.8683	<.0001	6.477
Ejection Fraction 20-29%	6.25	1.1611	<.0001	3.193
Ejection Fraction 30-39%	11.51	0.6507	0.0015	1.917
Ejection Fraction 40-49%	20.60	0.5318	0.0039	1.702
Previous MI				
No Previous MI within 20 days	77.55	---Reference---		1.000
Previous MI less than 6 hours	0.95	1.6211	<.0001	5.058
Previous MI 6 – 23 hours	1.37	0.9101	0.0265	2.485
Previous MI 1 – 7 days	15.07	0.5640	0.0010	1.758
Previous MI 8 – 20 days	5.05	0.5247	0.0206	1.690
Comorbidities				
COPD	20.42	0.5957	<.0001	1.814
Extensive Aortic Atherosclerosis	7.34	0.5989	0.0011	1.820
Renal Failure				
No Renal Failure	87.78	---Reference---		1.000
Renal Failure, Creatinine 1.6 -3.0 mg/dL	9.21	0.8032	<.0001	2.233
Renal Failure, Creatinine > 3.0 mg/dL	0.75	1.9966	<.0001	7.364
Renal Failure, Dialysis	2.26	1.9317	<.0001	6.901
Previous Open Heart Operations	3.60	1.0462	<.0001	2.847
Intercept = -6.1023				
C Statistic = 0.813				

2006 HOSPITAL OUTCOMES FOR CABG SURGERY

Table 2 and Figure 1 present the CABG surgery results for the 39 hospitals performing this operation in NYS in 2006. The table contains, for each hospital, the number of isolated CABG operations (CABG operations with no other major heart surgery earlier in the hospital stay) for patients discharged in 2006, the number of in-hospital/30-day deaths, the OMR, the EMR based on the statistical model presented in Table 1, the RAMR, and a 95 percent confidence interval for the RAMR.

As indicated in Table 2, the overall in-hospital/30-day mortality rate for the 11,929 CABG procedures performed at the 39 hospitals was 1.92 percent. In-hospital/30-day OMRs ranged from 0.00 percent to 6.11 percent. The range of EMRs, which measure patient severity of illness, was 1.13 percent to 2.60 percent.

The RAMRs, which are used to measure performance, ranged from 0.00 percent to 8.32 percent. One hospital (Montefiore Medical Center - Jack D. Weiler Hospital of Albert Einstein College Division in the Bronx) had a RAMR that was significantly higher than

the statewide rate. No hospitals had RAMRs that were significantly lower than the statewide rate.

The 2006 in-hospital/30-day mortality rate of 1.92 percent for Isolated CABG is slightly less than the 2.02 percent observed in 2005.

The in-hospital OMR for 2006 Isolated CABG discharges (not shown in Table 2) was 1.46 percent for all 11,929 patients included in the analysis.

Figures 1 and 2 provide a visual representation of the data displayed in Tables 2 and 3. For each hospital, the black dot represents the RAMR and the gray bar represents the confidence interval, or potential statistical error, for the RAMR. The black vertical line is the NYS in-hospital/30-day mortality rate. For any hospital where the gray bar crosses the state average line, the RAMR is not statistically different from the State as a whole. Hospitals that are statistical outliers will have gray bars (confidence intervals) that are either entirely above or entirely below the line for the statewide rate.

2004 - 2006 HOSPITAL OUTCOMES FOR VALVE SURGERY

Table 3 and Figure 2 present the combined Valve Only and Valve/CABG surgery results for the 39 hospitals performing these operations in NYS during the years 2004-2006. The table contains, for each hospital, the combined number of Valve Only and Valve/CABG operations resulting in 2004-2006 discharges, the number of in-hospital/30-day deaths, the OMR, the EMR based on the statistical models presented in Appendices 2-3, the RAMR and a 95 percent confidence interval for the RAMR.

As indicated in Table 3, the overall in-hospital/30-day mortality rate for the 20,969 combined Valve Only and Valve/CABG procedures performed at the 39 hospitals was 5.83 percent. The OMRs ranged from 2.28 percent to 11.44 percent. The range of EMRs, which measure patient severity of illness, was 2.65 percent to 7.99 percent.

The RAMRs, which are used to measure performance, ranged from 2.18 percent to 13.76 percent. Two hospitals (Maimonides Medical Center in Brooklyn and St. Elizabeth Medical Center in Utica) had RAMRs that

were significantly higher than the statewide rate. Three hospitals (Albany Medical Center Hospital in Albany, St. Joseph's Hospital Health Center in Syracuse and Vassar Brothers Medical Center in Poughkeepsie) had significantly lower RAMRs than the State.

Table 4 presents valve procedures performed at the 39 cardiac surgery hospitals in NYS during 2004-2006. The table contains, for each hospital, the number of valve operations (as defined by eight separate groups: Aortic Valve Replacements, Aortic Valve Repair or Replacements plus CABG, Mitral Valve Replacement, Mitral Valve Replacement plus CABG, Mitral Valve Repair, Mitral Valve Repair plus CABG, Multiple Valve Surgery, Multiple Valve Surgery plus CABG) resulting in 2004-2006 discharges. In addition to the hospital volumes, the rate of in-hospital/30-day death for the State (Statewide Mortality Rate) is given for each group. Unless otherwise specified, when the report refers to Valve or Valve/CABG procedures it is referring to the last column of Table 4.

The 2004-2006 in-hospital/30-day OMR of 5.83 percent for valve surgeries is lower than the 6.15 percent observed for 2003-2005. The in-hospital OMR for 2004-2006 valve surgeries (not shown in Table 3) is 5.13 percent for the 20,969 patients included in this analysis.

Note on Hospitals Not Performing Cardiac Surgery During Entire 2004-2006 Period

Two hospitals began performing cardiac surgery during the 2004 - 2006 time period on which this report is based. These hospitals and the month of the first cardiac surgery are listed below. New York Methodist Hospital - April 2004; Champlain Valley Physicians Hospital - November 2004.

DEFINITIONS OF KEY TERMS

The **observed mortality rate (OMR)** is the observed number of deaths divided by the total number of cases.

The **expected mortality rate (EMR)** is the sum of the predicted probabilities of death for all patients divided by the total number of patients.

The **risk-adjusted mortality rate (RAMR)** is the best estimate, based on the statistical model, of what the provider's mortality rate would have been if the provider had a mix of patients identical to the statewide mix. It is obtained by first dividing the OMR by the EMR, and then multiplying by the relevant statewide mortality rate (for example 1.92 percent for Isolated CABG patients in 2006 or 5.83 percent for Valve or Valve/CABG patients in 2004-2006).

Confidence Intervals are used to identify which hospitals had significantly more or fewer deaths than expected given the risk factors of their patients. The confidence interval identifies the range in which the RAMR may fall. Hospitals with significantly higher rates than expected after adjusting for risk are those where the confidence interval range falls entirely above the statewide mortality rate. Hospitals with significantly lower rates than expected, given the severity of illness of their patients before surgery, have confidence intervals entirely below the statewide mortality rate.

The more cases a provider performs, the narrower their confidence interval will be. This is because as a provider performs more cases, the likelihood of chance variation in the RAMR decreases.

Table 2: In-Hospital/30-Day Observed, Expected and Risk-Adjusted Mortality Rates for Isolated CABG Surgery in New York State, 2006 Discharges (Listed Alphabetically by Hospital)

Hospital	Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR
Albany Medical Center	415	7	1.69	1.81	1.79	(0.72, 3.69)
Arnot Ogden Med Ctr	106	2	1.89	2.46	1.47	(0.17, 5.31)
Bellevue Hospital Ctr	99	1	1.01	1.13	1.72	(0.02, 9.58)
Beth Israel Med Ctr	248	8	3.23	1.46	4.23	(1.82, 8.34)
Buffalo General Hosp	412	5	1.21	1.52	1.53	(0.49, 3.57)
Champ.Valley Phys Hosp	76	0	0.00	1.19	0.00	(0.00, 7.77)
Ellis Hospital	284	4	1.41	1.82	1.48	(0.40, 3.80)
Erie County Med Ctr	166	5	3.01	1.31	4.43	(1.43,10.34)
LIJ Medical Center	219	3	1.37	2.04	1.29	(0.26, 3.77)
Lenox Hill Hospital	472	6	1.27	1.96	1.25	(0.46, 2.72)
M. Imogene Bassett Hosp	64	0	0.00	1.16	0.00	(0.00, 9.48)
Maimonides Medical Ctr	355	8	2.25	2.13	2.03	(0.87, 4.00)
Mercy Hospital	233	7	3.00	1.83	3.15	(1.26, 6.48)
Millard Fillmore Hosp	338	5	1.48	1.83	1.55	(0.50, 3.62)
Montefiore - Einstein	131	8	6.11	1.41	8.32 *	(3.58,16.39)
Montefiore - Moses	278	7	2.52	1.62	2.99	(1.20, 6.17)
Mount Sinai Hospital	260	5	1.92	1.88	1.96	(0.63, 4.58)
NY Hospital - Queens	151	4	2.65	1.33	3.82	(1.03, 9.79)
NY Methodist Hospital	129	0	0.00	2.60	0.00	(0.00, 2.10)
NYP- Columbia Presby.	371	9	2.43	1.60	2.91	(1.33, 5.52)
NYP- Weill Cornell	437	5	1.14	1.92	1.14	(0.37, 2.66)
NYU Hospitals Center	86	2	2.33	1.20	3.71	(0.42,13.38)
North Shore Univ Hosp	655	13	1.98	2.37	1.61	(0.86, 2.75)
Rochester General Hosp	498	10	2.01	2.60	1.48	(0.71, 2.72)
SVCMC- St. Vincents	235	5	2.13	1.69	2.42	(0.78, 5.65)
St. Elizabeth Med Ctr	280	10	3.57	2.01	3.41	(1.63, 6.28)
St. Francis Hospital	990	15	1.52	2.07	1.40	(0.78, 2.31)
St. Josephs Hospital	654	8	1.22	1.83	1.28	(0.55, 2.53)
St. Lukes at St. Lukes	153	5	3.27	2.59	2.43	(0.78, 5.66)
St. Peters Hospital	443	13	2.93	1.75	3.22	(1.71, 5.50)
Staten Island Univ Hosp	403	7	1.74	2.45	1.36	(0.54, 2.80)
Strong Memorial Hosp	344	5	1.45	2.21	1.26	(0.41, 2.94)
United Hlth Svcs-Wilson	230	8	3.48	2.32	2.88	(1.24, 5.67)
Univ.Hosp-Brooklyn	90	2	2.22	1.79	2.38	(0.27, 8.60)
Univ.Hosp-SUNY Upstate	258	3	1.16	1.44	1.55	(0.31, 4.54)
Univ.Hosp-Stony Brook	312	5	1.60	1.75	1.76	(0.57, 4.11)
Vassar Bros. Med Ctr	240	2	0.83	1.50	1.06	(0.12, 3.84)
Westchester Med Ctr	540	9	1.67	2.01	1.60	(0.73, 3.03)
Winthrop Univ. Hosp	274	8	2.92	1.77	3.17	(1.36, 6.25)
Statewide Total	11929	229	1.92	1.92	1.92	

* RAMR significantly higher than statewide rate based on 95 percent confidence interval.

Figure 1: In-Hospital/30-Day Risk-Adjusted Mortality Rates for Isolated CABG in New York State, 2006 Discharges

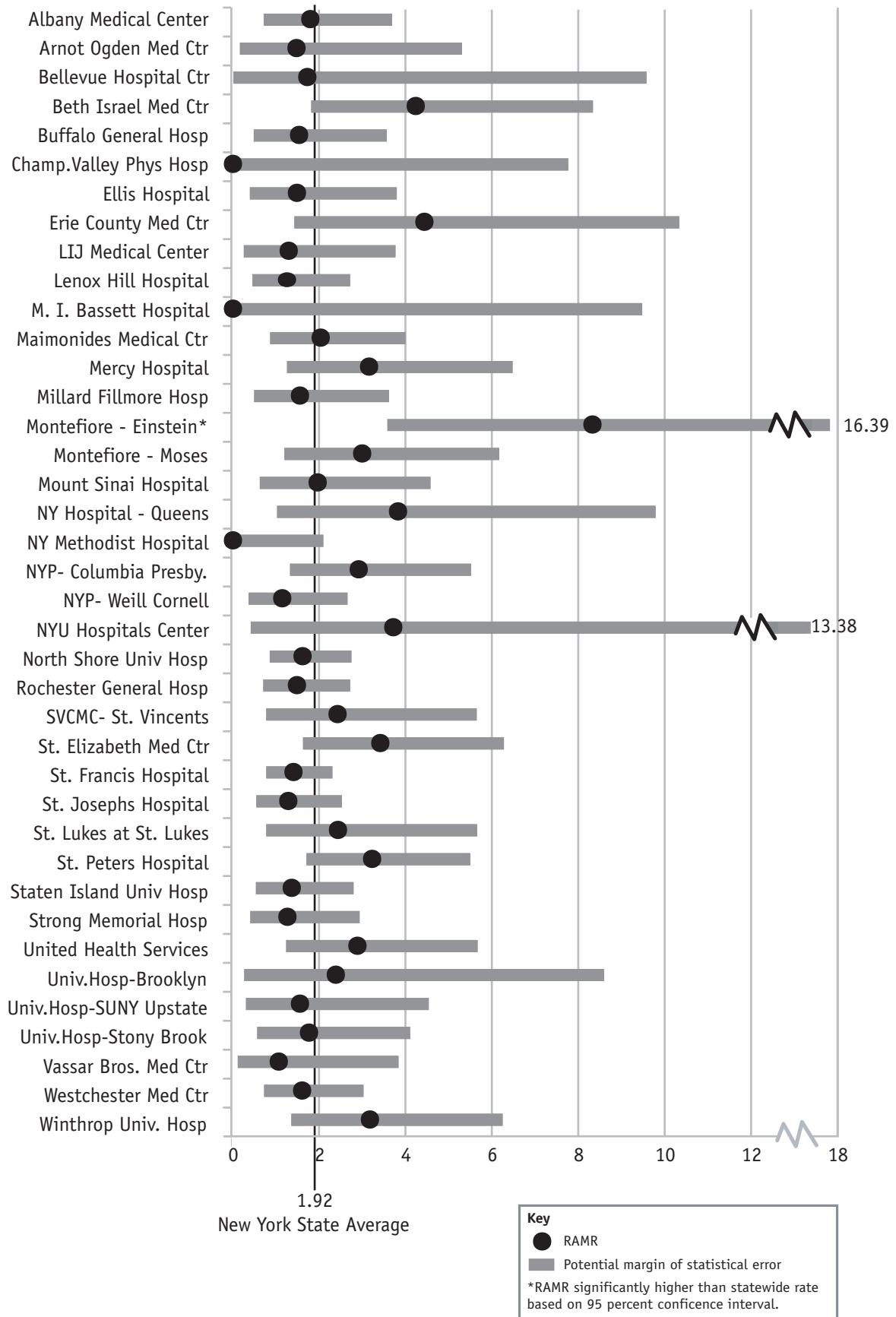


Table 3: In-Hospital/30-Day Observed, Expected and Risk-Adjusted Mortality Rates for Valve or Valve/CABG Surgery in New York State, 2004-2006 Discharges.

Hospital	Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR
Albany Medical Center	481	14	2.91	5.14	3.30 **	(1.80, 5.53)
Arnot Ogden Med Ctr	80	2	2.50	3.47	4.20	(0.47,15.16)
Bellevue Hospital Ctr	180	8	4.44	3.16	8.20	(3.53,16.15)
Beth Israel Med Ctr	473	39	8.25	6.62	7.26	(5.16, 9.93)
Buffalo General Hosp	436	21	4.82	4.95	5.67	(3.51, 8.66)
Champ.Valley Phys Hosp	16	1	6.25	2.65	13.76	(0.18,76.57)
Ellis Hospital	368	18	4.89	4.76	5.99	(3.55, 9.46)
Erie County Med Ctr	251	13	5.18	4.45	6.78	(3.61,11.60)
LIJ Medical Center	560	54	9.64	7.42	7.57	(5.69, 9.88)
Lenox Hill Hospital	809	53	6.55	6.36	6.00	(4.50, 7.85)
M. I. Bassett Hospital	69	4	5.80	3.29	10.28	(2.77,26.32)
Maimonides Medical Ctr	472	54	11.44	6.94	9.61 *	(7.22,12.54)
Mercy Hospital	78	7	8.97	6.39	8.18	(3.28,16.85)
Millard Fillmore Hosp	217	8	3.69	4.10	5.24	(2.26,10.33)
Montefiore - Einstein	283	15	5.30	5.83	5.30	(2.96, 8.73)
Montefiore - Moses	415	28	6.75	6.99	5.62	(3.74, 8.13)
Mount Sinai Hospital	1032	58	5.62	5.53	5.92	(4.50, 7.66)
NY Hospital - Queens	195	11	5.64	4.34	7.57	(3.77,13.54)
NY Methodist Hospital	108	7	6.48	4.95	7.64	(3.06,15.74)
NYP- Columbia Presby.	1651	64	3.88	4.76	4.74	(3.65, 6.06)
NYP- Weill Cornell	1126	61	5.42	5.24	6.03	(4.61, 7.75)
NYU Hospitals Center	1535	91	5.93	4.84	7.14	(5.75, 8.76)
North Shore Univ Hosp	1346	70	5.20	6.47	4.68	(3.65, 5.92)
Rochester General Hosp	852	61	7.16	6.84	6.10	(4.66, 7.83)
SVCMC- St. Vincents	275	23	8.36	5.50	8.86	(5.61,13.29)
St. Elizabeth Med Ctr	457	44	9.63	6.93	8.10 *	(5.88,10.87)
St. Francis Hospital	1771	102	5.76	6.46	5.19	(4.24, 6.31)
St. Josephs Hospital	851	38	4.47	6.70	3.88 **	(2.75, 5.33)
St. Lukes at St. Lukes	394	17	4.31	6.89	3.65	(2.13, 5.85)
St. Peters Hospital	770	33	4.29	5.27	4.74	(3.26, 6.66)
Staten Island Univ Hosp	266	19	7.14	6.03	6.91	(4.16,10.79)
Strong Memorial Hosp	629	40	6.36	5.37	6.90	(4.93, 9.39)
United Health Services	254	14	5.51	5.74	5.59	(3.05, 9.38)
Univ.Hosp-Brooklyn	151	10	6.62	4.19	9.21	(4.41,16.93)
Univ.Hosp-SUNY Upstate	387	22	5.68	5.21	6.35	(3.98, 9.62)
Univ.Hosp-Stony Brook	435	35	8.05	6.13	7.66	(5.33,10.65)
Vassar Bros. Med Ctr	351	8	2.28	6.09	2.18 **	(0.94, 4.29)
Westchester Med Ctr	470	20	4.26	6.03	4.12	(2.51, 6.36)
Winthrop Univ. Hosp	475	35	7.37	7.99	5.37	(3.74, 7.47)
Total	20969	1222	5.83	5.83	5.83	

* RAMR significantly higher than statewide rate based on 95 percent confidence interval.

** RAMR significantly lower than statewide rate based on 95 percent confidence interval.

Figure 2: In-Hospital/30-Day Risk-Adjusted Mortality Rates for Valve or Valve/CABG Surgery in New York State, 2004-2006 Discharges

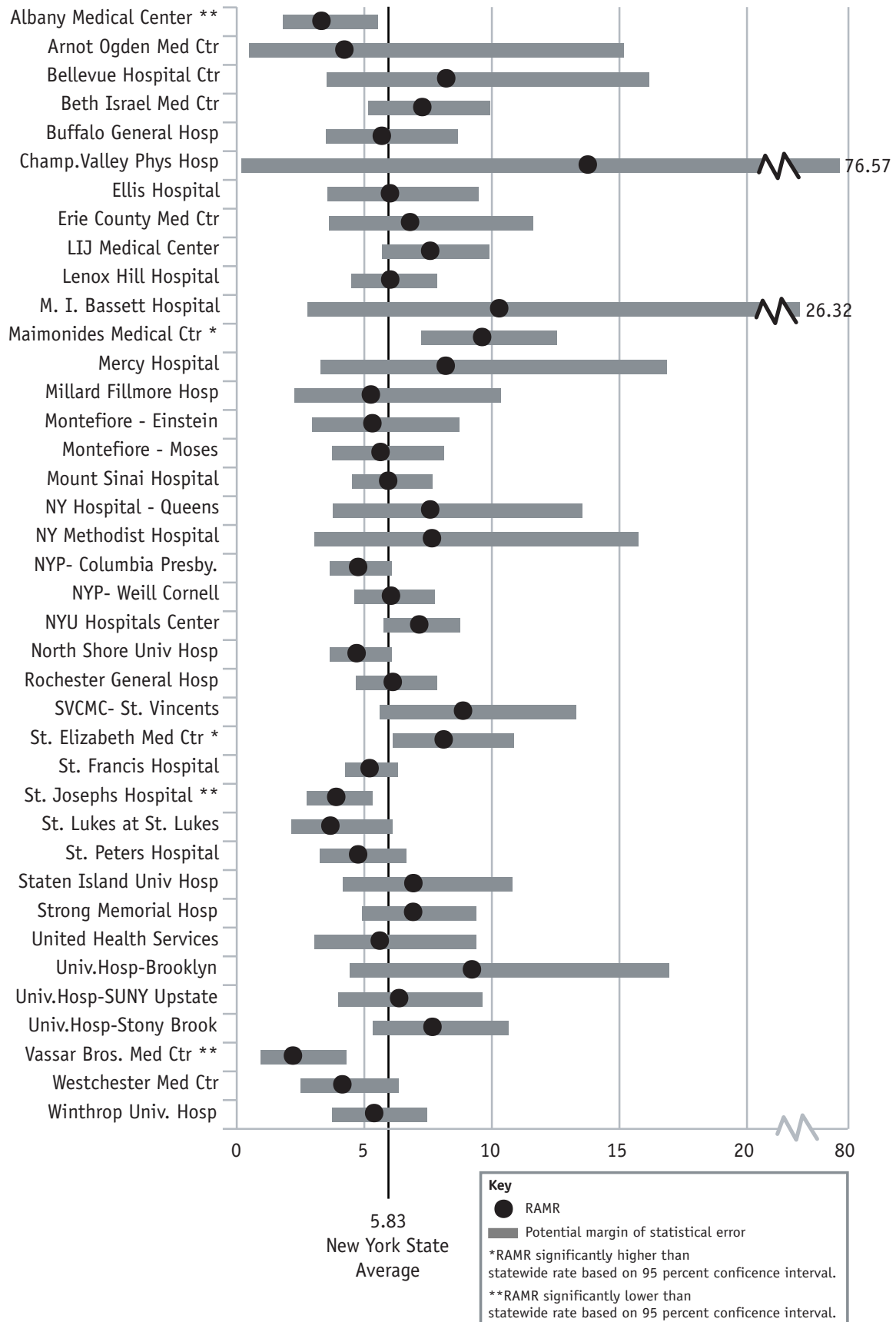


Table 4: Hospital Volume for Valve Procedures in New York State, 2004-2006 Discharges

Hospital	Aortic Valve Replace Surgery	Aortic Valve and CABG	Mitral Valve Replace Surgery	Mitral Replace and CABG	Mitral Valve Repair Surgery	Mitral Repair and CABG	Multiple Valve Surgery	Multiple Valve and CABG	Total Valve or Valve/ CABG
Albany Medical Center	131	170	48	20	30	36	32	14	481
Arnot Ogden Med Ctr	36	22	6	3	4	6	1	2	80
Bellevue Hospital Ctr	59	10	30	10	16	15	36	4	180
Beth Israel Med Ctr	65	103	51	37	41	57	84	35	473
Buffalo General Hosp	109	131	35	20	36	80	15	10	436
Champ.Valley Phys Hosp	7	3	4	0	1	0	0	1	16
Ellis Hospital	116	125	24	12	36	27	19	9	368
Erie County Med Ctr	87	58	26	17	14	6	28	15	251
LIJ Medical Center	106	123	100	69	33	35	60	34	560
Lenox Hill Hospital	144	122	66	38	151	121	121	46	809
M. I. Bassett Hospital	29	22	8	2	5	2	0	1	69
Maimonides Medical Ctr	124	101	68	34	27	50	52	16	472
Mercy Hospital	18	32	4	2	3	10	7	2	78
Millard Fillmore Hosp	64	67	14	4	29	18	11	10	217
Montefiore - Einstein	48	42	55	33	28	39	30	8	283
Montefiore - Moses	79	84	53	42	30	48	57	22	415
Mount Sinai Hospital	181	142	48	14	177	96	289	85	1032
NY Hospital - Queens	66	40	37	13	11	8	13	7	195
NY Methodist Hospital	29	21	18	4	9	8	14	5	108
NYP- Columbia Presby.	449	291	184	83	311	112	170	51	1651
NYP- Weill Cornell	379	227	133	59	103	43	133	49	1126
NYU Hospitals Center	549	118	139	23	471	78	134	23	1535
North Shore Univ Hosp	414	335	185	71	92	83	120	46	1346
Rochester General Hosp	258	241	84	58	76	61	45	29	852
SVCMC- St. Vincents	94	55	26	13	21	28	22	16	275
St. Elizabeth Med Ctr	83	111	29	39	26	87	40	42	457
St. Francis Hospital	527	463	129	80	144	148	176	104	1771
St. Josephs Hospital	222	234	68	78	59	76	70	44	851
St. Lukes at St. Lukes	62	68	62	23	51	46	45	37	394
St. Peters Hospital	237	213	52	22	65	79	67	35	770
Staten Island Univ Hosp	58	81	49	33	10	19	11	5	266
Strong Memorial Hosp	176	153	76	37	81	24	61	21	629
United Health Services	63	104	31	25	8	5	12	6	254
Univ.Hosp-Brooklyn	29	14	31	5	15	19	32	6	151
Univ.Hosp-SUNY Upstate	110	83	29	12	59	42	36	16	387
Univ.Hosp-Stony Brook	124	108	38	30	16	47	46	26	435
Vassar Bros. Med Ctr	84	75	41	44	21	47	19	20	351
Westchester Med Ctr	156	148	32	21	28	46	24	15	470
Winthrop Univ. Hosp	116	155	34	39	25	55	24	27	475
Total	5688	4695	2147	1169	2363	1807	2156	944	20969
Statewide Mortality Rate (%)	3.60	5.28	5.82	11.21	1.74	7.91	8.95	14.41	5.83

2004 – 2006 HOSPITAL AND SURGEON OUTCOMES

Table 5 provides the number of Isolated CABG operations, number of CABG patients who died in the hospital or after discharge but within 30 days of surgery, OMR, EMR, RAMR and the 95 percent confidence interval for the RAMR for isolated CABG patients in 2004-2006. In addition, the final two columns provide the number of Isolated CABG, Valve and Valve/CABG procedures and the RAMR for these patients in 2004-2006 for each of the 39 hospitals performing these operations during the time period. Surgeons and hospitals with RAMRs that are significantly lower or higher than the statewide mortality rate (as judged by the 95 percent confidence interval) are also noted.

The hospital information is presented for each surgeon who met at least one of the following criteria: (a) performed 200 or more cardiac operations during 2004-2006, (b) performed at least one cardiac operation in each of the years, 2004-2006. A cardiac

operation is defined as any reportable adult cardiac operation and may include cases not listed in Tables 5 or 6.

The results for surgeons not meeting either of the above criteria are grouped together and reported as “All Others” in the hospital in which the operations were performed. Surgeons who met the above criteria and who performed operations in more than one hospital during 2004-2006 are noted in Table 5 and listed under all hospitals in which they performed these operations.

Also, surgeons who met either criterion (a) or (b) above and have performed Isolated CABG, Valve or Valve/CABG operations in two or more NYS hospitals are listed separately in Table 6. This table contains the same information as Table 5 across all hospitals in which the surgeon performed operations.

Table 5: In-Hospital/30-Day Observed, Expected and Risk-Adjusted Mortality Rates by Surgeon for Isolated CABG and Valve Surgery (done in combination with or without CABG) in New York State, 2004 - 2006 Discharges

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
STATEWIDE TOTAL	37645	755	2.01	2.01	2.01		58614	3.37
Albany Medical Center								
Britton L	352	6	1.70	1.57	2.18	(0.80, 4.74)	501	2.32
Devejian N	.	.	.	.	.	( . , . )	1	0.00
#Fuzesi L	263	3	1.14	2.20	1.04	(0.21, 3.04)	302	2.06
Miller S	345	9	2.61	1.83	2.85	(1.30, 5.42)	484	3.04
Sardella G	355	2	0.56	1.47	0.77	(0.09, 2.78)	508	1.99
Total	1315	20	1.52	1.74	1.76	(1.07, 2.71)	1796	2.41 **
Arnot Ogden Med Ctr								
Nast E	190	5	2.63	2.06	2.57	(0.83, 5.99)	238	3.63
All Others	134	1	0.75	2.33	0.64	(0.01, 3.58)	166	1.59
Total	324	6	1.85	2.17	1.71	(0.63, 3.73)	404	2.75
Bellevue Hospital Ctr								
##Ciuffo G B	1	0	0.00	1.39	0.00	(0.00,100.0)	1	0.00
#Grau J B	139	2	1.44	1.09	2.64	(0.30, 9.54)	212	2.98
#Ribakove G	49	0	0.00	1.52	0.00	(0.00, 9.88)	99	4.86
#Schwartz C F	117	1	0.85	1.33	1.28	(0.02, 7.15)	170	4.17
All Others	32	0	0.00	1.25	0.00	(0.00,18.37)	36	0.00
Total	338	3	0.89	1.25	1.42	(0.29, 4.15)	518	3.74

Table 5 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Beth Israel Med Ctr								
Geller C M	55	0	0.00	1.09	0.00	(0.00,12.31)	77	4.13
Hoffman D	154	3	1.95	1.63	2.40	(0.48, 7.02)	176	5.35
Stelzer P	42	3	7.14	2.55	5.61	(1.13,16.40)	282	4.61
Tranbaugh R	457	9	1.97	1.80	2.19	(1.00, 4.16)	620	3.40
All Others	99	2	2.02	1.96	2.06	(0.23, 7.45)	125	4.51
Total	807	17	2.11	1.78	2.38	(1.38, 3.81)	1280	4.14
Buffalo General Hosp								
##Ashraf M	29	0	0.00	1.79	0.00	(0.00,14.20)	32	0.00
Grosner G	788	13	1.65	1.82	1.82	(0.97, 3.11)	1194	3.12
#Lewin A	329	7	2.13	1.27	3.37	(1.35, 6.94)	337	5.46
##Malekan R	2	0	0.00	0.54	0.00	(0.00,100.0)	3	0.00
##Picone A	5	0	0.00	0.43	0.00	(0.00,100.0)	8	0.00
All Others	171	8	4.68	1.44	6.53 *	(2.81,12.88)	186	9.93 *
Total	1324	28	2.11	1.63	2.61	(1.73, 3.77)	1760	3.83
Champ.Valley Phys Hosp								
#Bennett E	14	1	7.14	1.32	10.88	(0.14,60.52)	17	15.55
#Canavan T	11	0	0.00	1.00	0.00	(0.00,67.15)	12	0.00
#Dal Col R	1	0	0.00	0.33	0.00	(0.00,100.0)	1	0.00
#Depan H	1	0	0.00	0.58	0.00	(0.00,100.0)	1	0.00
#Reich H	5	0	0.00	1.40	0.00	(0.00,100.0)	6	0.00
##Saifi J	4	0	0.00	0.99	0.00	(0.00,100.0)	4	0.00
##Singh C	4	0	0.00	1.22	0.00	(0.00,100.0)	4	0.00
All Others	123	0	0.00	1.12	0.00	(0.00, 5.36)	134	1.95
Total	163	1	0.61	1.13	1.09	(0.01, 6.09)	179	2.99
Ellis Hospital								
#Depan H	260	2	0.77	1.98	0.78	(0.09, 2.82)	474	2.98
#Reich H	271	3	1.11	1.53	1.45	(0.29, 4.25)	354	2.51
##Saifi J	1	0	0.00	1.27	0.00	(0.00,100.0)	1	0.00
##Singh C	258	7	2.71	1.53	3.56	(1.43, 7.33)	311	5.27
All Others	62	1	1.61	1.14	2.83	(0.04,15.75)	80	2.90
Total	852	13	1.53	1.64	1.87	(0.99, 3.20)	1220	3.32
Erie County Med Ctr								
#Aldridge J	8	0	0.00	1.20	0.00	(0.00,76.56)	12	0.00
##Ashraf M	52	1	1.92	1.76	2.19	(0.03,12.18)	66	4.79
#Bell-Thomson J	408	8	1.96	1.75	2.25	(0.97, 4.43)	605	3.95
#Datta S	132	8	6.06	2.00	6.07 *	(2.61,11.96)	144	9.30 *
#Downing S W	33	1	3.03	1.59	3.82	(0.05,21.25)	40	7.26

Table 5 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Erie County Med Ctr, <i>continued</i>								
#Jennings L	.	.	.	.	.	(. , .)	1	0.00
All Others	47	2	4.26	1.58	5.39	(0.61,19.45)	63	4.94
Total	680	20	2.94	1.77	3.32 *	(2.03, 5.14)	931	4.79
LIJ Medical Center								
Graver L	289	3	1.04	2.54	0.82	(0.16, 2.40)	628	3.48
Manetta F	179	5	2.79	2.53	2.22	(0.71, 5.17)	262	5.24
Palazzo R	282	1	0.35	2.17	0.33 **	(0.00, 1.83)	413	2.85
Parnell V	.	.	.	.	.	(. , .)	1	0.00
#Vatsia S	.	.	.	.	.	(. , .)	1	0.00
All Others	5	0	0.00	2.17	0.00	(0.00,67.70)	10	0.00
Total	755	9	1.19	2.39	1.00 **	(0.46, 1.90)	1315	3.56
Lenox Hill Hospital								
##Ciuffo G B	3	0	0.00	2.08	0.00	(0.00,100.0)	3	0.00
Fonger J D	9	0	0.00	1.77	0.00	(0.00,46.22)	12	0.00
Loulmet D F	44	0	0.00	1.36	0.00	(0.00,12.27)	323	2.39
Patel N C	469	5	1.07	2.00	1.07	(0.35, 2.50)	665	3.15
Patel N U	173	1	0.58	1.40	0.83	(0.01, 4.59)	208	3.83
Reddy R C	134	3	2.24	1.86	2.41	(0.48, 7.04)	211	1.63
Subramanian V	500	10	2.00	2.44	1.64	(0.79, 3.02)	690	3.83
Tolis G	54	1	1.85	1.51	2.46	(0.03,13.70)	80	2.84
All Others	1	0	0.00	1.67	0.00	(0.00,100.0)	4	0.00
Total	1387	20	1.44	2.03	1.43	(0.87, 2.20)	2196	3.09
M. I. Bassett Hospital								
Lancey R A	111	1	0.90	1.66	1.09	(0.01, 6.04)	151	1.14
Shortt K G	99	0	0.00	1.21	0.00	(0.00, 6.12)	124	4.44
All Others	6	0	0.00	0.77	0.00	(0.00,100.0)	10	28.02
Total	216	1	0.46	1.43	0.65	(0.01, 3.61)	285	3.14
Maimonides Medical Ctr								
Abrol S	177	7	3.95	2.59	3.06	(1.23, 6.30)	233	5.04
#Brevetti G R	6	0	0.00	1.78	0.00	(0.00,68.81)	12	5.31
Cunningham J N	123	2	1.63	1.83	1.78	(0.20, 6.42)	167	5.87
#Genovesi M H	48	2	4.17	1.58	5.29	(0.59,19.10)	59	5.78
Jacobowitz I	496	14	2.82	2.50	2.26	(1.23, 3.79)	709	4.81 *
Vaynblat M	274	7	2.55	2.46	2.08	(0.83, 4.28)	350	3.38
Zisbrod Z	123	5	4.07	2.54	3.21	(1.04, 7.50)	149	4.86
All Others	97	4	4.12	1.90	4.36	(1.17,11.17)	137	9.46 *
Total	1344	41	3.05	2.37	2.58	(1.85, 3.50)	1816	4.96 *

Table 5 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Mercy Hospital								
#Bell-Thomson J	87	1	1.15	1.49	1.54	(0.02, 8.59)	89	2.51
Carlson R E	277	12	4.33	2.00	4.33 *	(2.24, 7.57)	308	7.59 *
#Downing S W	312	6	1.92	2.26	1.71	(0.62, 3.72)	357	2.91
Total	676	19	2.81	2.06	2.74	(1.65, 4.28)	754	4.64
Millard Fillmore Hosp								
#Aldridge J	189	10	5.29	1.80	5.89 *	(2.82,10.83)	217	8.53 *
##Ashraf M	562	5	0.89	1.83	0.98	(0.31, 2.28)	726	1.62 **
#Datta S	14	0	0.00	0.73	0.00	(0.00,72.08)	18	0.00
#Jennings L	49	0	0.00	1.12	0.00	(0.00,13.44)	51	0.00
#Lewin A	1	0	0.00	0.38	0.00	(0.00,100.0)	1	0.00
##Malekan R	12	0	0.00	1.38	0.00	(0.00,44.33)	15	12.50
##Picone A	16	0	0.00	1.21	0.00	(0.00,37.95)	26	4.55
All Others	54	2	3.70	1.83	4.06	(0.46,14.67)	60	7.71
Total	897	17	1.90	1.75	2.18	(1.27, 3.48)	1114	3.43
Montefiore - Einstein								
#Attai L	6	0	0.00	1.51	0.00	(0.00,81.00)	8	0.00
##D Alessandro D A	12	1	8.33	0.57	29.55	(0.39,100.0)	16	14.53
##Derose J J	22	1	4.55	2.79	3.27	(0.04,18.20)	32	9.10
#Goldstein D J	41	2	4.88	1.96	5.00	(0.56,18.05)	54	6.62
#Merav A	12	2	16.67	2.16	15.50	(1.74,55.97)	15	15.58
#Michler R E	27	0	0.00	1.70	0.00	(0.00,16.00)	68	2.74
##Plestis K A	146	2	1.37	1.80	1.53	(0.17, 5.52)	283	2.47
All Others	197	10	5.08	1.57	6.48 *	(3.10,11.92)	270	6.11
Total	463	18	3.89	1.73	4.51 *	(2.67, 7.12)	746	4.54
Montefiore - Moses								
#Attai L	158	2	1.27	1.39	1.82	(0.20, 6.58)	235	3.76
#Crooke G	10	0	0.00	0.75	0.00	(0.00,97.99)	14	0.00
##D Alessandro D A	113	4	3.54	1.85	3.83	(1.03, 9.80)	161	4.89
##Derose J J	6	0	0.00	0.45	0.00	(0.00,100.0)	6	0.00
#Goldstein D J	136	0	0.00	1.68	0.00	(0.00, 3.22)	190	1.42
#Merav A	177	6	3.39	1.99	3.42	(1.25, 7.44)	257	4.34
#Michler R E	91	2	2.20	1.95	2.26	(0.25, 8.15)	194	2.82
##Plestis K A	61	1	1.64	1.82	1.81	(0.02,10.06)	87	2.23
All Others	66	3	4.55	1.22	7.50	(1.51,21.92)	89	12.34 *
Total	818	18	2.20	1.70	2.60	(1.54, 4.11)	1233	3.62

Table 5 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Mount Sinai Hospital								
Adams D H	25	0	0.00	1.34	0.00	(0.00,22.02)	499	3.65
Aklog L	110	1	0.91	2.65	0.69	(0.01, 3.83)	186	4.35
Filsoufi F	176	3	1.70	1.54	2.22	(0.45, 6.50)	294	2.34
Griep R	2	0	0.00	3.28	0.00	(0.00,100.0)	49	3.02
#Lansman S	75	1	1.33	2.37	1.13	(0.01, 6.29)	109	2.41
##Plestis K A	42	1	2.38	1.29	3.71	(0.05,20.63)	123	2.86
##Sarabu M	113	1	0.88	1.66	1.07	(0.01, 5.94)	149	0.96
#Spielvogel D	84	4	4.76	2.35	4.06	(1.09,10.39)	116	5.04
#Zias E	263	4	1.52	2.13	1.43	(0.39, 3.67)	390	2.83
All Others	3	2	66.67	11.17	11.97	(1.34,43.23)	10	10.78
Total	893	17	1.90	2.03	1.88	(1.10, 3.01)	1925	3.36
NY Hospital - Queens								
#Adkins M	203	8	3.94	1.81	4.37	(1.88, 8.61)	267	7.10 *
##Ko W	296	6	2.03	2.20	1.85	(0.68, 4.02)	385	3.23
##Mack CA	30	0	0.00	1.59	0.00	(0.00,15.40)	35	5.23
##Tortolani A	.	.	.	.	.	( . , . )	2	0.00
All Others	71	3	4.23	1.95	4.35	(0.88,12.72)	106	3.71
Total	600	17	2.83	2.01	2.83	(1.65, 4.53)	795	4.60
NY Methodist Hospital								
#Lee L Y	116	0	0.00	2.26	0.00	(0.00, 2.80)	152	0.74
##Mack CA	1	0	0.00	0.29	0.00	(0.00,100.0)	1	0.00
##Tortolani A	225	3	1.33	2.02	1.32	(0.27, 3.86)	297	3.80
Total	342	3	0.88	2.10	0.84	(0.17, 2.45)	450	2.69
NYP- Columbia Presby.								
Argenziano M	113	4	3.54	1.79	3.96	(1.07,10.14)	292	3.28
#Chen J M	.	.	.	.	.	( . , . )	3	23.85
##D Alessandro D A	2	0	0.00	1.61	0.00	(0.00,100.0)	3	0.00
Esrig B	1	0	0.00	0.23	0.00	(0.00,100.0)	3	0.00
Mosca R S	1	0	0.00	0.33	0.00	(0.00,100.0)	4	30.43
Naka Y	229	9	3.93	2.07	3.81	(1.74, 7.23)	428	3.64
Oz M	295	2	0.68	1.36	1.00	(0.11, 3.62)	805	2.50
#Quaegebeur J	.	.	.	.	.	( . , . )	12	0.00
Rose E	11	0	0.00	0.58	0.00	(0.00,100.0)	24	0.00
Smith C	289	4	1.38	1.07	2.58	(0.70, 6.62)	831	2.61
Stewart A S	201	3	1.49	2.15	1.39	(0.28, 4.06)	379	3.32
All Others	8	1	12.50	2.32	10.80	(0.14,60.07)	17	3.54
Total	1150	23	2.00	1.61	2.50	(1.58, 3.74)	2801	3.02

Table 5 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
NYP- Weill Cornell								
#Adkins M	1	0	0.00	1.04	0.00	(0.00,100.0)	2	0.00
#Chen J M	.	.	.	.	.	( . , . )	2	0.00
Girardi L	474	4	0.84	2.04	0.83	(0.22, 2.12)	882	2.38
Isom O	41	1	2.44	0.84	5.85	(0.08,32.53)	142	3.91
##Ko W	89	3	3.37	2.02	3.34	(0.67, 9.77)	143	6.03
Krieger K	349	6	1.72	1.83	1.89	(0.69, 4.11)	728	2.79
#Lee L Y	153	3	1.96	3.12	1.26	(0.25, 3.69)	235	5.02
##Mack CA	19	0	0.00	2.30	0.00	(0.00,16.86)	28	0.00
##Tortolani A	189	1	0.53	2.97	0.36 **	(0.00, 1.99)	265	1.65
All Others	40	0	0.00	2.45	0.00	(0.00, 7.52)	54	2.75
Total	1355	18	1.33	2.21	1.20 **	(0.71, 1.90)	2481	3.00
NYU Hospitals Center								
##Ciuffo G B	46	1	2.17	2.18	2.00	(0.03,11.11)	103	2.57
Colvin S	42	0	0.00	1.68	0.00	(0.00,10.41)	742	4.76 *
#Crooke G	6	0	0.00	1.72	0.00	(0.00,71.25)	13	8.37
Culliford A	143	3	2.10	2.25	1.87	(0.38, 5.45)	339	3.83
Galloway A	90	5	5.56	2.24	4.98	(1.60,11.62)	476	3.46
#Grau J B	.	.	.	.	.	( . , . )	7	6.34
Grossi E	15	1	6.67	2.00	6.68	(0.09,37.16)	51	9.94 *
#Ribakove G	75	3	4.00	2.55	3.14	(0.63, 9.18)	207	3.39
#Schwartz C F	22	0	0.00	2.26	0.00	(0.00,14.82)	36	5.14
Total	439	13	2.96	2.22	2.67	(1.42, 4.57)	1974	4.17 *
North Shore Univ Hosp								
Esposito R	508	12	2.36	2.12	2.24	(1.16, 3.91)	725	2.60
Hall M	391	12	3.07	2.37	2.60	(1.34, 4.54)	620	3.99
Hartman A	262	2	0.76	1.98	0.77	(0.09, 2.79)	715	1.73 **
Kalimi R	283	8	2.83	2.39	2.38	(1.02, 4.68)	388	3.25
Pogo G	319	11	3.45	2.48	2.79	(1.39, 4.99)	480	4.10
#Vatsia S	217	3	1.38	2.76	1.01	(0.20, 2.94)	345	2.24
All Others	140	1	0.71	2.00	0.72	(0.01, 3.99)	193	4.24
Total	2120	49	2.31	2.29	2.02	(1.49, 2.67)	3466	2.96
Rochester General Hosp								
Cheeran D	629	10	1.59	2.38	1.34	(0.64, 2.47)	968	3.13
#Green G R	255	5	1.96	2.65	1.49	(0.48, 3.47)	322	2.84
Kirshner R	633	17	2.69	2.51	2.14	(1.25, 3.43)	1067	3.46
All Others	81	3	3.70	2.49	2.98	(0.60, 8.70)	93	4.93
Total	1598	35	2.19	2.48	1.77	(1.23, 2.46)	2450	3.31

Table 5 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
SVCMC- St. Vincents								
##Ciuffo G B	60	2	3.33	2.58	2.60	(0.29, 9.37)	119	7.46 *
Lang S	343	3	0.87	2.02	0.87	(0.17, 2.53)	450	3.45
Shin Y T	300	4	1.33	2.40	1.12	(0.30, 2.86)	408	2.25
All Others	2	0	0.00	1.37	0.00	(0.00,100.0)	3	0.00
Total	705	9	1.28	2.23	1.15	(0.52, 2.18)	980	3.50
St. Elizabeth Med Ctr								
El Amir N	182	3	1.65	1.60	2.06	(0.41, 6.03)	281	4.59
Joyce F	288	9	3.13	2.19	2.86	(1.31, 5.44)	476	4.44
Kelley J	320	11	3.44	1.96	3.52	(1.75, 6.29)	469	5.00
##Singh C	56	3	5.36	2.12	5.08	(1.02,14.83)	77	8.36
Total	846	26	3.07	1.97	3.13 *	(2.04, 4.58)	1303	4.88 *
St. Francis Hospital								
Bercow N	374	7	1.87	2.03	1.85	(0.74, 3.82)	596	3.58
Colangelo R	630	11	1.75	2.28	1.54	(0.77, 2.75)	846	2.25
Damus P	325	1	0.31	1.84	0.34 **	(0.00, 1.87)	610	2.57
Fernandez H A	368	5	1.36	1.77	1.54	(0.50, 3.60)	467	2.72
Lamendola C	407	10	2.46	2.23	2.21	(1.06, 4.07)	626	2.87
Robinson N	508	7	1.38	1.61	1.72	(0.69, 3.55)	824	3.72
Taylor J	532	7	1.32	2.08	1.27	(0.51, 2.62)	927	2.35
All Others	71	4	5.63	2.34	4.83	(1.30,12.37)	90	8.10
Total	3215	52	1.62	2.00	1.62	(1.21, 2.13)	4986	2.91
St. Josephs Hospital								
#Green G R	150	3	2.00	1.64	2.45	(0.49, 7.15)	200	2.81
Marvasti M	341	3	0.88	1.72	1.03	(0.21, 3.00)	610	1.40 **
Nazem A	481	4	0.83	2.08	0.80	(0.22, 2.05)	649	1.94 **
Rosenberg J	316	5	1.58	1.64	1.94	(0.62, 4.52)	553	3.32
Zhou Z	414	7	1.69	1.86	1.82	(0.73, 3.76)	541	2.41
Total	1702	22	1.29	1.83	1.42	(0.89, 2.14)	2553	2.29 **
St. Lukes at St. Lukes								
Balaram S K	36	1	2.78	2.64	2.11	(0.03,11.75)	70	1.74
##Derose J J	169	4	2.37	2.56	1.85	(0.50, 4.74)	303	3.04
Swistel D	281	7	2.49	2.65	1.89	(0.76, 3.89)	505	2.24
All Others	.	.	.	.	.	( . , . )	2	0.00
Total	486	12	2.47	2.62	1.89	(0.98, 3.31)	880	2.45

Table 5 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
St. Peters Hospital								
#Bennett E	226	3	1.33	1.59	1.67	(0.34, 4.89)	457	2.68
#Canavan T	366	5	1.37	1.83	1.50	(0.48, 3.50)	431	2.45
#Dal Col R	347	9	2.59	1.19	4.37	(1.99, 8.29)	608	4.09
##Saifi J	367	10	2.72	1.76	3.10	(1.49, 5.71)	580	3.49
Total	1306	27	2.07	1.60	2.59	(1.71, 3.77)	2076	3.29
Staten Island Univ Hosp								
McGinn J	937	23	2.45	2.55	1.93	(1.22, 2.89)	1111	3.44
Molinaro P J	175	1	0.57	1.81	0.63	(0.01, 3.52)	230	2.74
Nabagiez J P	22	0	0.00	1.12	0.00	(0.00,29.94)	31	5.84
Rosell F M	249	4	1.61	1.82	1.77	(0.48, 4.54)	277	2.86
Total	1383	28	2.02	2.30	1.76	(1.17, 2.55)	1649	3.31
Strong Memorial Hosp								
Alfieris G	.	.	.	.	.	(. , .)	4	0.00
Hicks G	320	2	0.63	1.69	0.74	(0.08, 2.68)	451	4.10
Knight P	561	9	1.60	2.02	1.60	(0.73, 3.03)	996	3.03
Massey H	228	6	2.63	2.54	2.08	(0.76, 4.53)	287	3.74
Total	1109	17	1.53	2.03	1.52	(0.88, 2.43)	1738	3.41
United Health Services								
Quintos E	228	10	4.39	2.49	3.54	(1.69, 6.50)	286	5.76
Wong K	273	2	0.73	2.15	0.68	(0.08, 2.47)	380	1.45
Yousuf M	273	9	3.30	2.84	2.33	(1.06, 4.42)	362	3.76
Total	774	21	2.71	2.49	2.18	(1.35, 3.34)	1028	3.48
Univ.Hosp-Brooklyn								
#Brevetti G R	34	0	0.00	1.40	0.00	(0.00,15.45)	63	0.00
Burack J H	44	0	0.00	1.22	0.00	(0.00,13.68)	65	0.00
#Genovesi M H	136	2	1.47	1.96	1.51	(0.17, 5.44)	158	4.78
##Ko W	10	1	10.00	1.17	17.12	(0.22,95.26)	16	11.61
Lowery R C	70	3	4.29	1.78	4.82	(0.97,14.09)	143	7.24
Total	294	6	2.04	1.71	2.39	(0.87, 5.20)	445	4.75
Univ.Hosp-SUNY Upstate								
Fink G W	335	7	2.09	1.58	2.64	(1.06, 5.45)	490	3.90
Lutz C J	321	7	2.18	1.93	2.26	(0.91, 4.66)	467	3.27
##Picone A	137	8	5.84	2.06	5.68 *	(2.44,11.18)	223	6.49 *
Total	793	22	2.77	1.81	3.08	(1.93, 4.66)	1180	4.30

Table 5 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Univ.Hosp-Stony Brook								
Bilfinger T	144	4	2.78	1.92	2.90	(0.78, 7.43)	198	5.86
Krukenkamp I	212	7	3.30	1.68	3.93	(1.57, 8.10)	317	4.49
McLarty A	110	1	0.91	1.86	0.98	(0.01, 5.45)	145	3.53
#Quaegebeur J	.	.	.	.	.	(. , .)	1	0.00
Seifert F	492	10	2.03	1.70	2.39	(1.15, 4.40)	675	3.74
All Others	124	3	2.42	1.87	2.59	(0.52, 7.58)	181	5.81
Total	1082	25	2.31	1.76	2.63	(1.70, 3.88)	1517	4.43 *
Vassar Bros. Med Ctr								
Ciaburri D	168	2	1.19	1.90	1.26	(0.14, 4.54)	290	1.65
##Sarabu M	78	1	1.28	1.33	1.94	(0.03,10.78)	156	1.43
Zakow P	302	6	1.99	1.98	2.01	(0.73, 4.38)	428	1.75
All Others	62	0	0.00	1.33	0.00	(0.00, 8.92)	87	3.35
Total	610	9	1.48	1.81	1.64	(0.75, 3.11)	961	1.77 **
Westchester Med Ctr								
Fleisher A	331	13	3.93	2.51	3.14	(1.67, 5.38)	414	5.12
#Fuzesi L	10	1	10.00	1.01	19.89	(0.26,100.0)	11	20.46
Lafaro R	140	6	4.29	2.19	3.92	(1.43, 8.53)	200	4.32
#Lansman S	295	5	1.69	2.16	1.57	(0.51, 3.67)	396	1.34 **
##Malekan R	4	0	0.00	0.70	0.00	(0.00,100.0)	9	0.00
##Sarabu M	220	3	1.36	1.71	1.60	(0.32, 4.68)	291	2.51
Sett S	.	.	.	.	.	(. , .)	2	0.00
#Spielvogel D	272	2	0.74	2.10	0.70	(0.08, 2.54)	364	2.16
#Zias E	147	1	0.68	2.27	0.60	(0.01, 3.35)	185	1.20
All Others	57	0	0.00	1.89	0.00	(0.00, 6.84)	74	3.20
Total	1476	31	2.10	2.15	1.96	(1.33, 2.78)	1946	2.86
Winthrop Univ. Hosp								
Goncalves J A	221	5	2.26	3.04	1.49	(0.48, 3.49)	321	2.83
Kofsky E	232	9	3.88	2.78	2.80	(1.28, 5.31)	297	4.84
Kokotos W J	255	8	3.14	2.42	2.60	(1.12, 5.13)	388	3.77
Schubach S	300	0	0.00	1.66	0.00 **	(0.00, 1.48)	477	1.08 **
Total	1008	22	2.18	2.41	1.82	(1.14, 2.75)	1483	3.09
STATEWIDE TOTAL	37645	755	2.01	2.01	2.01		58614	3.37

* RAMR significantly higher than statewide rate based on 95 percent confidence interval.

** RAMR significantly lower than statewide rate based on 95 percent confidence interval.

Performed operations in another NYS hospital.

Performed operations in two or more other NYS hospitals.

Table 6: Summary Information for Surgeons Practicing at More than One Hospital, 2004-2006

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Adkins M	204	8	3.92	1.80	4.36	(1.88, 8.59)	269	7.07 *
NY Hospital - Queens	203	8	3.94	1.81	4.37	(1.88, 8.61)	267	7.10 *
NYP- Weill Cornell	1	0	0.00	1.04	0.00	(0.00,100.0)	2	0.00
Aldridge J	197	10	5.08	1.78	5.73 *	(2.74,10.54)	229	7.89 *
Erie County Med Ctr	8	0	0.00	1.20	0.00	(0.00,76.56)	12	0.00
Millard Fillmore Hosp	189	10	5.29	1.80	5.89 *	(2.82,10.83)	217	8.53 *
Ashraf M	643	6	0.93	1.82	1.03	(0.38, 2.24)	824	1.81 **
Buffalo General Hosp	29	0	0.00	1.79	0.00	(0.00,14.20)	32	0.00
Erie County Med Ctr	52	1	1.92	1.76	2.19	(0.03,12.18)	66	4.79
Millard Fillmore Hosp	562	5	0.89	1.83	0.98	(0.31, 2.28)	726	1.62 **
Attai L	164	2	1.22	1.40	1.75	(0.20, 6.32)	243	3.65
Montefiore - Einstein	6	0	0.00	1.51	0.00	(0.00,81.00)	8	0.00
Montefiore - Moses	158	2	1.27	1.39	1.82	(0.20, 6.58)	235	3.76
Bell-Thomson J	495	9	1.82	1.70	2.14	(0.98, 4.06)	694	3.84
Erie County Med Ctr	408	8	1.96	1.75	2.25	(0.97, 4.43)	605	3.95
Mercy Hospital	87	1	1.15	1.49	1.54	(0.02, 8.59)	89	2.51
Bennett E	240	4	1.67	1.58	2.12	(0.57, 5.43)	474	2.88
Champ.Valley Phys Hosp	14	1	7.14	1.32	10.88	(0.14,60.52)	17	15.55
St. Peters Hospital	226	3	1.33	1.59	1.67	(0.34, 4.89)	457	2.68
Brevetti G R	40	0	0.00	1.46	0.00	(0.00,12.62)	75	1.55
Maimonides Medical Ctr	6	0	0.00	1.78	0.00	(0.00,68.81)	12	5.31
Univ.Hosp-Brooklyn	34	0	0.00	1.40	0.00	(0.00,15.45)	63	0.00
Canavan T	377	5	1.33	1.80	1.48	(0.48, 3.45)	443	2.42
Champ.Valley Phys Hosp	11	0	0.00	1.00	0.00	(0.00,67.15)	12	0.00
St. Peters Hospital	366	5	1.37	1.83	1.50	(0.48, 3.50)	431	2.45
Chen J M	.	.	.	.	.	( . , . )	5	19.54
NYP- Columbia Presby.	.	.	.	.	.	( . , . )	3	23.85
NYP- Weill Cornell	.	.	.	.	.	( . , . )	2	0.00
Ciuffo G B	110	3	2.73	2.39	2.29	(0.46, 6.69)	226	5.14
Bellevue Hospital Ctr	1	0	0.00	1.39	0.00	(0.00,100.0)	1	0.00
Lenox Hill Hospital	3	0	0.00	2.08	0.00	(0.00,100.0)	3	0.00
NYU Hospitals Center	46	1	2.17	2.18	2.00	(0.03,11.11)	103	2.57
SVCMC- St. Vincents	60	2	3.33	2.58	2.60	(0.29, 9.37)	119	7.46 *
Crooke G	16	0	0.00	1.11	0.00	(0.00,41.25)	27	5.20
Montefiore - Moses	10	0	0.00	0.75	0.00	(0.00,97.99)	14	0.00
NYU Hospitals Center	6	0	0.00	1.72	0.00	(0.00,71.25)	13	8.37

Table 6 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
D Alessandro D A	127	5	3.94	1.73	4.57	(1.47,10.66)	180	5.25
Montefiore - Einstein	12	1	8.33	0.57	29.55	(0.39,100.0)	16	14.53
Montefiore - Moses	113	4	3.54	1.85	3.83	(1.03, 9.80)	161	4.89
NYP- Columbia Presby.	2	0	0.00	1.61	0.00	(0.00,100.0)	3	0.00
Dal Col R	348	9	2.59	1.19	4.37	(1.99, 8.29)	609	4.09
Champ.Valley Phys Hosp	1	0	0.00	0.33	0.00	(0.00,100.0)	1	0.00
St. Peters Hospital	347	9	2.59	1.19	4.37	(1.99, 8.29)	608	4.09
Datta S	146	8	5.48	1.88	5.84 *	(2.52,11.51)	162	8.61 *
Erie County Med Ctr	132	8	6.06	2.00	6.07 *	(2.61,11.96)	144	9.30 *
Millard Fillmore Hosp	14	0	0.00	0.73	0.00	(0.00,72.08)	18	0.00
Depan H	261	2	0.77	1.97	0.78	(0.09, 2.81)	475	2.98
Champ.Valley Phys Hosp	1	0	0.00	0.58	0.00	(0.00,100.0)	1	0.00
Ellis Hospital	260	2	0.77	1.98	0.78	(0.09, 2.82)	474	2.98
Derosé J J	197	5	2.54	2.52	2.02	(0.65, 4.71)	341	3.50
Montefiore - Einstein	22	1	4.55	2.79	3.27	(0.04,18.20)	32	9.10
Montefiore - Moses	6	0	0.00	0.45	0.00	(0.00,100.0)	6	0.00
St. Lukes at St. Lukes	169	4	2.37	2.56	1.85	(0.50, 4.74)	303	3.04
Downing S W	345	7	2.03	2.19	1.85	(0.74, 3.82)	397	3.27
Erie County Med Ctr	33	1	3.03	1.59	3.82	(0.05,21.25)	40	7.26
Mercy Hospital	312	6	1.92	2.26	1.71	(0.62, 3.72)	357	2.91
Fuzesi L	273	4	1.47	2.16	1.36	(0.37, 3.49)	313	2.42
Albany Medical Center	263	3	1.14	2.20	1.04	(0.21, 3.04)	302	2.06
Westchester Med Ctr	10	1	10.00	1.01	19.89	(0.26,100.0)	11	20.46
Genovesi M H	184	4	2.17	1.86	2.35	(0.63, 6.00)	217	5.00
Maimonides Medical Ctr	48	2	4.17	1.58	5.29	(0.59,19.10)	59	5.78
Univ.Hosp-Brooklyn	136	2	1.47	1.96	1.51	(0.17, 5.44)	158	4.78
Goldstein D J	177	2	1.13	1.74	1.30	(0.15, 4.69)	244	2.33
Montefiore - Einstein	41	2	4.88	1.96	5.00	(0.56,18.05)	54	6.62
Montefiore - Moses	136	0	0.00	1.68	0.00	(0.00, 3.22)	190	1.42
Grau J B	139	2	1.44	1.09	2.64	(0.30, 9.54)	219	3.44
Bellevue Hospital Ctr	139	2	1.44	1.09	2.64	(0.30, 9.54)	212	2.98
NYU Hospitals Center	.	.	.	.	.	(. , .)	7	6.34
Green G R	405	8	1.98	2.27	1.74	(0.75, 3.43)	522	2.83
Rochester General Hosp	255	5	1.96	2.65	1.49	(0.48, 3.47)	322	2.84
St. Josephs Hospital	150	3	2.00	1.64	2.45	(0.49, 7.15)	200	2.81
Jennings L	49	0	0.00	1.12	0.00	(0.00,13.44)	52	0.00
Erie County Med Ctr	.	.	.	.	.	(. , .)	1	0.00
Millard Fillmore Hosp	49	0	0.00	1.12	0.00	(0.00,13.44)	51	0.00

Table 6 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Ko W	395	10	2.53	2.13	2.38	(1.14, 4.38)	544	4.28
NY Hospital - Queens	296	6	2.03	2.20	1.85	(0.68, 4.02)	385	3.23
NYP- Weill Cornell	89	3	3.37	2.02	3.34	(0.67, 9.77)	143	6.03
Univ.Hosp-Brooklyn	10	1	10.00	1.17	17.12	(0.22,95.26)	16	11.61
Lansman S	370	6	1.62	2.20	1.48	(0.54, 3.21)	505	1.61 **
Mount Sinai Hospital	75	1	1.33	2.37	1.13	(0.01, 6.29)	109	2.41
Westchester Med Ctr	295	5	1.69	2.16	1.57	(0.51, 3.67)	396	1.34 **
Lee L Y	269	3	1.12	2.75	0.81	(0.16, 2.38)	387	3.75
NY Methodist Hospital	116	0	0.00	2.26	0.00	(0.00, 2.80)	152	0.74
NYP- Weill Cornell	153	3	1.96	3.12	1.26	(0.25, 3.69)	235	5.02
Lewin A	330	7	2.12	1.26	3.37	(1.35, 6.94)	338	5.45
Buffalo General Hosp	329	7	2.13	1.27	3.37	(1.35, 6.94)	337	5.46
Millard Fillmore Hosp	1	0	0.00	0.38	0.00	(0.00,100.0)	1	0.00
Mack CA	50	0	0.00	1.83	0.00	(0.00, 8.02)	64	2.60
NY Hospital - Queens	30	0	0.00	1.59	0.00	(0.00,15.40)	35	5.23
NY Methodist Hospital	1	0	0.00	0.29	0.00	(0.00,100.0)	1	0.00
NYP- Weill Cornell	19	0	0.00	2.30	0.00	(0.00,16.86)	28	0.00
Malekan R	18	0	0.00	1.14	0.00	(0.00,35.94)	27	5.97
Buffalo General Hosp	2	0	0.00	0.54	0.00	(0.00,100.0)	3	0.00
Millard Fillmore Hosp	12	0	0.00	1.38	0.00	(0.00,44.33)	15	12.50
Westchester Med Ctr	4	0	0.00	0.70	0.00	(0.00,100.0)	9	0.00
Merav A	189	8	4.23	2.00	4.25	(1.83, 8.37)	272	4.88
Montefiore - Einstein	12	2	16.67	2.16	15.50	(1.74,55.97)	15	15.58
Montefiore - Moses	177	6	3.39	1.99	3.42	(1.25, 7.44)	257	4.34
Michler R E	118	2	1.69	1.89	1.79	(0.20, 6.48)	262	2.80
Montefiore - Einstein	27	0	0.00	1.70	0.00	(0.00,16.00)	68	2.74
Montefiore - Moses	91	2	2.20	1.95	2.26	(0.25, 8.15)	194	2.82
Picone A	158	8	5.06	1.93	5.27 *	(2.27,10.39)	257	6.23 *
Buffalo General Hosp	5	0	0.00	0.43	0.00	(0.00,100.0)	8	0.00
Millard Fillmore Hosp	16	0	0.00	1.21	0.00	(0.00,37.95)	26	4.55
Univ.Hosp-SUNY Upstate	137	8	5.84	2.06	5.68 *	(2.44,11.18)	223	6.49 *
Plestis K A	249	4	1.61	1.72	1.88	(0.50, 4.81)	493	2.53
Montefiore - Einstein	146	2	1.37	1.80	1.53	(0.17, 5.52)	283	2.47
Montefiore - Moses	61	1	1.64	1.82	1.81	(0.02,10.06)	87	2.23
Mount Sinai Hospital	42	1	2.38	1.29	3.71	(0.05,20.63)	123	2.86
Quaegebeur J	.	.	.	.	.	( . , . )	13	0.00
NYP- Columbia Presby	.	.	.	.	.	( . , . )	12	0.00
Univ.Hosp-Stony Brook	.	.	.	.	.	( . , . )	1	0.00

Table 6 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	Cases	No of Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Reich H	276	3	1.09	1.53	1.43	(0.29, 4.18)	360	2.48
Champ.Valley Phys Hosp	5	0	0.00	1.40	0.00	(0.00,100.0)	6	0.00
Ellis Hospital	271	3	1.11	1.53	1.45	(0.29, 4.25)	354	2.51
Ribakove G	124	3	2.42	2.15	2.26	(0.45, 6.61)	306	3.74
Bellevue Hospital Ctr	49	0	0.00	1.52	0.00	(0.00, 9.88)	99	4.86
NYU Hospitals Center	75	3	4.00	2.55	3.14	(0.63, 9.18)	207	3.39
Saifi J	372	10	2.69	1.75	3.08	(1.47, 5.66)	585	3.48
Champ.Valley Phys Hosp	4	0	0.00	0.99	0.00	(0.00,100.0)	4	0.00
Ellis Hospital	1	0	0.00	1.27	0.00	(0.00,100.0)	1	0.00
St. Peters Hospital	367	10	2.72	1.76	3.10	(1.49, 5.71)	580	3.49
Sarabu M	411	5	1.22	1.62	1.50	(0.48, 3.51)	596	1.86
Mount Sinai Hospital	113	1	0.88	1.66	1.07	(0.01, 5.94)	149	0.96
Vassar Bros. Med Ctr	78	1	1.28	1.33	1.94	(0.03,10.78)	156	1.43
Westchester Med Ctr	220	3	1.36	1.71	1.60	(0.32, 4.68)	291	2.51
Schwartz C F	139	1	0.72	1.48	0.97	(0.01, 5.42)	206	4.45
Bellevue Hospital Ctr	117	1	0.85	1.33	1.28	(0.02, 7.15)	170	4.17
NYU Hospitals Center	22	0	0.00	2.26	0.00	(0.00,14.82)	36	5.14
Singh C	318	10	3.14	1.63	3.87	(1.85, 7.12)	392	6.09 *
Champ.Valley Phys Hosp	4	0	0.00	1.22	0.00	(0.00,100.0)	4	0.00
Ellis Hospital	258	7	2.71	1.53	3.56	(1.43, 7.33)	311	5.27
St. Elizabeth Med Ctr	56	3	5.36	2.12	5.08	(1.02,14.83)	77	8.36
Spielvogel D	356	6	1.69	2.16	1.57	(0.57, 3.41)	480	2.86
Mount Sinai Hospital	84	4	4.76	2.35	4.06	(1.09,10.39)	116	5.04
Westchester Med Ctr	272	2	0.74	2.10	0.70	(0.08, 2.54)	364	2.16
Tortolani A	414	4	0.97	2.45	0.79	(0.21, 2.02)	564	2.59
NY Hospital - Queens	.	.	.	.	.	(. , .)	2	0.00
NY Methodist Hospital	225	3	1.33	2.02	1.32	(0.27, 3.86)	297	3.80
NYP- Weill Cornell	189	1	0.53	2.97	0.36 **	(0.00, 1.99)	265	1.65
Vatsia S	217	3	1.38	2.76	1.01	(0.20, 2.94)	346	2.24
LIJ Medical Center	.	.	.	.	.	(. , .)	1	0.00
North Shore Univ Hosp	217	3	1.38	2.76	1.01	(0.20, 2.94)	345	2.24
Zias E	410	5	1.22	2.18	1.12	(0.36, 2.62)	575	2.34
Mount Sinai Hospital	263	4	1.52	2.13	1.43	(0.39, 3.67)	390	2.83
Westchester Med Ctr	147	1	0.68	2.27	0.60	(0.01, 3.35)	185	1.20

*RAMR significantly higher than the statewide rate based on 95 percent confidence interval.

**RAMR significantly lower than the statewide rate based on 95 percent confidence interval.

SURGEON AND HOSPITAL VOLUMES FOR TOTAL ADULT CARDIAC SURGERY, 2004-2006

Table 7 presents, for each hospital and for each surgeon performing at least 200 cardiac operations in any hospital in 2004 – 2006 and/or performing one or more cardiac operations in each of the years 2004 – 2006, the total number of Isolated CABG operations, the total number of Valve or Valve/CABG operations, the total number of Other Cardiac operations and Total Cardiac operations. As in Table 5, results for surgeons not meeting the above criteria are grouped together in an “All Others” category.

The Isolated CABG column includes patients who undergo bypass of one or more of the coronary arteries with no other major heart surgery earlier in the same admission. Valve or Valve/CABG volumes include the total number of cases for the eight Valve or Valve/CABG groups that were identified in Table 4. Other Cardiac Surgery includes cardiac procedures not

represented by Isolated CABG, Valve or Valve/CABG operations and includes, but is not limited to: repairs of congenital conditions, heart transplants, aneurysm repairs, ventricular reconstruction and ventricular assist device insertions. Total Cardiac Surgery is the sum of the previous three columns and includes any procedure to the heart or great vessels.

Please note that the data presented in Table 7 includes those Non-NYS residents with surgery in December of 2006 that were excluded from the risk-adjusted mortality analyses. For this reason, the hospital and surgeon volumes presented here differ slightly from those presented in previous tables.

Table 7: Surgeon and Hospital Volume for Isolated CABG, Valve or Valve/CABG, Other Cardiac Surgery and Total Adult Cardiac Surgery, 2004-2006

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Albany Medical Center				
Britton L	353	150	41	544
Devejian N	0	1	21	22
Fuzesi L	265	39	22	326
Miller S	346	139	18	503
Sardella G	355	153	31	539
All Others	0	0	2	2
Total	1319	482	135	1936
Arnot Ogden Med Ctr				
Nast E	190	49	12	251
All Others	134	33	3	170
Total	324	82	15	421
Bellevue Hospital Ctr				
Ciuffo G B	1	0	2	3
Grau J B	140	73	20	233
Ribakove G	49	50	9	108
Schwartz C F	117	53	23	193
All Others	32	4	12	48
Total	339	180	66	585

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Beth Israel Med Ctr				
Geller C M	55	22	6	83
Hoffman D	154	22	6	182
Stelzer P	42	241	151	434
Tranbaugh R	459	163	20	642
All Others	99	26	3	128
Total	809	474	186	1469
Buffalo General Hosp				
Ashraf M	29	3	1	33
Grosner G	788	406	44	1238
Lewin A	329	8	7	344
Malekan R	2	1	4	7
Picone A	5	3	1	9
All Others	171	15	20	206
Total	1324	436	77	1837
Champ.Valley Phys Hosp				
Bennett E	14	3	0	17
Canavan T	11	1	0	12
Dal Col R	1	0	0	1
Depan H	1	0	0	1
Reich H	5	1	0	6
Saifi J	4	0	0	4
Singh C	4	0	0	4
All Others	123	11	2	136
Total	163	16	2	181
Ellis Hospital				
Depan H	260	214	52	526
Reich H	271	83	10	364
Saifi J	1	0	1	2
Singh C	258	53	8	319
All Others	62	18	2	82
Total	852	368	73	1293
Erie County Med Ctr				
Aldridge J	8	4	0	12
Ashraf M	52	14	1	67
Bell-Thomson J	408	197	58	663
Datta S	132	12	46	190
Downing S W	33	7	6	46
Jennings L	0	1	0	1
All Others	47	16	11	74
Total	680	251	122	1053

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
LIJ Medical Center				
Graver L	289	339	83	711
Manetta F	179	83	19	281
Palazzo R	282	131	19	432
Parnell V	0	1	14	15
Vatsia S	0	1	7	8
All Others	6	5	0	11
Total	756	560	142	1458
Lenox Hill Hospital				
Ciuffo G B	3	0	1	4
Fonger J D	9	3	1	13
Loulmet D F	44	279	28	351
Patel N C	470	197	26	693
Patel N U	173	35	6	214
Reddy R C	134	77	23	234
Subramanian V	503	190	45	738
Tolis G	54	26	65	145
All Others	1	3	0	4
Total	1391	810	195	2396
M. Imogene Bassett Hosp				
Lancey R A	111	40	11	162
Shortt K G	99	25	11	135
All Others	6	4	2	12
Total	216	69	24	309
Maimonides Medical Ctr				
Abrol S	177	57	64	298
Brevetti G R	6	6	1	13
Cunningham J N	123	44	14	181
Genovesi M H	48	11	5	64
Jacobowitz I	496	213	41	750
Vaynblat M	274	76	35	385
Zisbrod Z	123	26	5	154
All Others	97	40	15	152
Total	1344	473	180	1997
Mercy Hospital				
Bell-Thomson J	87	2	0	89
Carlson R E	277	31	17	325
Downing S W	312	45	35	392
Total	676	78	52	806

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Millard Fillmore Hosp				
Aldridge J	189	28	32	249
Ashraf M	562	164	23	749
Datta S	14	4	0	18
Jennings L	49	2	0	51
Lewin A	1	0	0	1
Malekan R	12	3	1	16
Picone A	16	10	0	26
All Others	54	6	1	61
Total	897	217	57	1171
Montefiore - Einstein				
Attai L	6	2	2	10
D Alessandro D A	12	4	4	20
Derose J J	22	10	0	32
Goldstein D J	41	13	4	58
Merav A	12	3	0	15
Michler R E	27	41	4	72
Plestis K A	146	137	80	363
All Others	197	73	32	302
Total	463	283	126	872
Montefiore - Moses				
Attai L	158	77	9	244
Crooke G	10	4	3	17
D Alessandro D A	113	48	22	183
Derose J J	6	0	3	9
Goldstein D J	136	54	16	206
Merav A	177	80	15	272
Michler R E	91	103	23	217
Plestis K A	61	26	7	94
All Others	66	23	47	136
Total	818	415	145	1378
Mount Sinai Hospital				
Adams D H	25	478	94	597
Aklog L	110	76	16	202
Filsoufi F	176	118	23	317
Griep R	2	47	227	276
Lansman S	75	34	11	120
Nguyen K	0	1	29	30
Plestis K A	42	81	127	250
Sarabu M	113	36	5	154

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Mount Sinai Hospital, continued				
Spielvogel D	84	32	85	201
Zias E	263	127	30	420
All Others	3	7	43	53
Total	893	1037	690	2620
NY Hospital - Queens				
Adkins M	203	64	13	280
Ko W	296	89	41	426
Mack CA	30	5	4	39
Tortolani A	0	2	0	2
All Others	71	35	3	109
Total	600	195	61	856
NY Methodist Hospital				
Lee L Y	116	36	42	194
Mack CA	1	0	0	1
Tortolani A	225	72	3	300
Total	342	108	45	495
NYP- Columbia Presby.				
Argenziano M	113	181	122	416
Chen J M	0	3	24	27
D Alessandro D A	2	1	4	7
Esrig B	1	2	3	6
Mosca R S	1	3	35	39
Naka Y	229	199	196	624
Oz M	297	517	71	885
Quaegebeur J	0	12	84	96
Rose E	11	13	4	28
Smith C	292	545	112	949
Stewart A S	201	181	248	630
All Others	8	9	142	159
Total	1155	1666	1045	3866
NYP- Weill Cornell				
Adkins M	1	1	0	2
Chen J M	0	2	5	7
Girardi L	474	408	544	1426
Isom O	41	102	7	150
Ko W	89	54	11	154
Krieger K	349	380	26	755
Lee L Y	153	82	15	250
Mack CA	19	9	3	31

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
NYP- Weill Cornell, continued				
Tortolani A	189	76	5	270
All Others	40	14	6	60
Total	1355	1128	622	3105
NYU Hospitals Center				
Ciuffo G B	46	57	20	123
Colvin S	42	703	104	849
Crooke G	6	7	2	15
Culliford A	143	197	35	375
Galloway A	92	386	62	540
Grau J B	0	7	5	12
Grossi E	15	36	15	66
Ribakove G	75	133	30	238
Schwartz C F	22	14	13	49
All Others	0	0	4	4
Total	441	1540	290	2271
North Shore Univ Hosp				
Esposito R	508	217	33	758
Hall M	391	229	21	641
Hartman A	263	453	105	821
Kalimi R	283	105	24	412
Pogo G	319	161	50	530
Vatsia S	217	128	27	372
All Others	140	53	25	218
Total	2121	1346	285	3752
Rochester General Hosp				
Cheeran D	629	339	83	1051
Green G R	255	67	25	347
Kirshner R	633	435	68	1136
All Others	81	12	2	95
Total	1598	853	178	2629
SVCMC- St. Vincents				
Ciuffo G B	60	59	9	128
Lang S	344	107	30	481
Shin Y T	300	108	34	442
All Others	2	1	5	8
Total	706	275	78	1059

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
St. Elizabeth Med Ctr				
El Amir N	182	99	35	316
Joyce F	288	188	22	498
Kelley J	320	149	29	498
Singh C	56	21	2	79
Total	846	457	88	1391
St. Francis Hospital				
Bercow N	376	222	32	630
Colangelo R	631	216	12	859
Damus P	325	285	31	641
Fernandez H A	368	99	21	488
Lamendola C	407	219	29	655
Robinson N	508	316	43	867
Taylor J	532	395	44	971
All Others	71	19	5	95
Total	3218	1771	217	5206
St. Josephs Hospital				
Green G R	150	50	8	208
Marvasti M	341	269	62	672
Nazem A	481	168	39	688
Rosenberg J	316	237	77	630
Zhou Z	414	127	20	561
All Others	0	0	1	1
Total	1702	851	207	2760
St. Lukes at St. Lukes				
Balaram S K	36	34	12	82
Derose J J	169	134	83	386
Swistel D	281	224	39	544
All Others	0	2	0	2
Total	486	394	134	1014
St. Peters Hospital				
Bennett E	226	232	61	519
Canavan T	366	65	4	435
Dal Col R	347	261	42	650
Saifi J	367	213	28	608
Total	1306	771	135	2212

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Staten Island Univ Hosp				
McGinn J	937	174	19	1130
Molinaro P J	175	55	6	236
Nabagiez J P	22	9	3	34
Rosell F M	250	28	21	299
Total	1384	266	49	1699
Strong Memorial Hosp				
Alfieris G	0	4	26	30
Hicks G	320	131	68	519
Knight P	561	436	136	1133
Massey H	228	59	96	383
Total	1109	630	326	2065
United Hlth Svcs-Wilson				
Quintos E	228	58	10	296
Wong K	273	107	10	390
Yousuf M	274	89	24	387
Total	775	254	44	1073
Univ.Hosp-Brooklyn				
Brevetti G R	34	29	9	72
Burack J H	44	21	8	73
Genovesi M H	136	22	3	161
Ko W	10	6	2	18
Lowery R C	70	73	23	166
Total	294	151	45	490
Univ.Hosp-SUNY Upstate				
Fink G W	335	155	68	558
Lutz C J	321	146	30	497
Picone A	137	86	26	249
All Others	0	0	22	22
Total	793	387	146	1326
Univ.Hosp-Stony Brook				
Bilfinger T	144	54	25	223
Krukenkamp I	212	105	25	342
McLarty A	110	35	34	179
Quaegebeur J	0	1	1	2
Seifert F	493	183	17	693
All Others	124	57	6	187
Total	1083	435	108	1626

Table 7 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Vassar Bros. Med Ctr				
Ciaburri D	168	122	16	306
Sarabu M	78	78	31	187
Zakow P	302	126	23	451
All Others	62	25	3	90
Total	610	351	73	1034
Westchester Med Ctr				
Fleisher A	331	83	34	448
Fuzesi L	10	1	5	16
Lafaro R	140	60	33	233
Lansman S	295	101	12	408
Malekan R	4	5	7	16
Sarabu M	220	71	17	308
Sett S	0	2	7	9
Spielvogel D	272	92	65	429
Zias E	147	38	18	203
All Others	57	17	6	80
Total	1476	470	204	2150
Winthrop Univ. Hosp				
Goncalves J A	221	100	43	364
Kofsky E	232	65	8	305
Kokotos W J	255	133	26	414
Schubach S	300	177	11	488
Total	1008	475	88	1571
Statewide Total	37672	21005	6755	65432

Criteria Used in Reporting Significant Risk Factors (2006)

Based on Documentation in Medical Records

Patient Risk Factor	Definitions
Hemodynamic State	Determined just prior to surgery.
<ul style="list-style-type: none"> • Unstable • Shock 	<p>Patient requires pharmacologic or mechanical support to maintain blood pressure or cardiac output.</p> <p>Acute hypotension (systolic blood pressure < 80 mmHg) or low cardiac index (< 2.0 liters/min/m²), despite pharmacologic or mechanical support.</p> <p>Records with this risk factor were excluded from all analyses in this report.</p>
Comorbidities	
<ul style="list-style-type: none"> • COPD • Extensive Aortic Atherosclerosis • Renal Failure, Creatinine • Renal Failure Requiring Dialysis 	<p>Patients who require chronic (longer than three months) bronchodilator therapy to avoid disability from obstructive airway disease, or have forced expiratory volume in one second of less than 75 percent of the predicted value or less than 1.25 liters or have a room air PO₂ <60 or a PCO₂ >50.</p> <p>Ascending, transverse and/or descending aortic atherosclerosis marked by either extensive calcification or luminal atheroma such that the intended surgical procedure is altered.</p> <p>Highest pre-operative creatinine during the hospital admission was in the indicated range.</p> <p>The patient is on chronic peritoneal or hemodialysis.</p>
Ventricular Function	
<ul style="list-style-type: none"> • Ejection Fraction • Previous MI 	<p>Value of the ejection fraction taken closest to the procedure. When a calculated measure is unavailable the ejection fraction should be estimated visually from the ventriculogram or by echocardiography. Intraoperative direct observation of the heart is not an adequate basis for a visual estimate of the ejection fraction. If no ejection fraction is reported, the ejection fraction is considered “normal” for purposes of analysis and is classified with the reference category.</p> <p>One or more myocardial infarctions (MI) in the specified time period prior to surgery.</p>
Previous Open Heart Operations	<p>Open heart surgery performed prior to the current operating room visit. Minimally invasive procedures are included.</p>

MEDICAL TERMINOLOGY

angina pectoris - The pain or discomfort felt when blood and oxygen flow to the heart are impeded by blockages in the coronary arteries. Can also be caused by an arterial spasm.

angioplasty - Also known as *percutaneous transluminal coronary angioplasty* (PTCA) or *percutaneous coronary intervention* (PCI). In this procedure, a balloon catheter is threaded up to the site of blockage in an artery in the heart, and is then inflated to push arterial plaque against the wall of the artery to create a wider channel in the artery. Other procedures or devices are frequently used in conjunction with, or in place of, the balloon catheter. In particular, stents are used for most patients and devices such as rotoblators and ultrasound are sometimes used.

arteriosclerosis - Also called *atherosclerotic coronary artery disease* or *coronary artery disease*, the group of diseases characterized by thickening and loss of elasticity of the arterial walls, popularly called "hardening of the arteries."

atherosclerosis - One form of arteriosclerosis in which plaques or fatty deposits form in the inner layer of the arteries.

coronary artery bypass graft surgery (CABG) - A procedure in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart muscle, bypassing the arterial blockage. Typically, a section of one of the large saphenous veins in the leg, the radial artery in the arm or the mammary artery in the chest is used to construct the bypass. One or more bypasses may be performed during a single operation. When no other major heart surgery (such as valve replacement) is included, the operation is referred to as an isolated CABG.

The average number of bypass grafts created during CABG is three or four. Generally, all significantly blocked arteries are bypassed unless they enter areas of the heart that are permanently damaged by previous heart attacks. Five or more bypasses are occasionally created. Multiple bypasses are often performed to provide several alternate routes for the blood flow and to improve the long-term success of the procedure, not necessarily because the patient's condition is more severe.

cardiac catheterization - Also known as *coronary angiography*, a procedure for diagnosing the condition of the heart and the arteries connecting to it. A thin tube threaded through an artery to the heart releases a dye, which allows doctors to observe blockages with an X-ray camera. This procedure is generally required before coronary bypass surgery.

cardiovascular disease - Disease of the heart and blood vessels, the most common form is coronary artery disease.

coronary arteries - The arteries that supply the heart muscle with blood. When they are narrowed or blocked, oxygen-rich blood cannot flow freely to the heart muscle or myocardium.

heart valve- Gates that connect the different chambers of the heart so that there is a one-way flow of blood between the chambers. The heart has four valves: the tricuspid, mitral, pulmonic, and aortic valves.

incompetent valves - A valve that does not close tightly.

ischemic heart disease (ischemia) - Heart disease that occurs as a result of inadequate blood supply to the heart muscle or myocardium.

myocardial infarction (MI) - Also called a *heart attack*, partial destruction of the heart muscle due to interrupted blood supply.

plaque - Also called *atheroma*, this is the fatty deposit in the coronary artery that can block blood flow.

risk factors for heart disease - Certain risk factors have been found to increase the likelihood of developing heart disease. Some are controllable or avoidable and some cannot be controlled. The biggest heart disease risk factors are heredity, gender and age; none of which can be controlled. Men are much more likely to develop heart disease than women before the age of 55, although it is the number one killer of both men and women.

Some controllable risk factors that contribute to a higher likelihood of developing coronary artery disease are high cholesterol levels, cigarette smoking, high blood pressure (hypertension), obesity, a sedentary lifestyle or lack of exercise, diabetes and poor stress management.

stenosis - The narrowing of an artery due to blockage. Restenosis is when the narrowing recurs after surgery.

stenotic valve- A valve that does not open fully.

valve disease- Occurs when a valve cannot open all of the way (reducing flow to the next heart chamber) or cannot close all of the way (causing blood to leak backwards into the previous heart chamber).

valve repair- Widening valve openings for stenotic valves or narrowing or tightening valve openings for incompetent valves without having to replace the valves.

valve replacement- Replacement of a diseased valve. New valves are either mechanical (durable materials such as Dacron or titanium) or biological (tissues taken from pigs, cows or human donors).

Appendix 1. 2004-2006 Risk Factors For Isolated CABG In-Hospital/30-Day Mortality

The significant pre-procedural risk factors for in-hospital/30-day mortality following isolated CABG in the 2004-2006 time period are presented in the table that follows.

Roughly speaking, the odds ratio for a risk factor represents the number of times a patient with that risk factor is more likely to die in the hospital during or after CABG or after discharge but within 30 days of the operation than a patient without the risk factor, all other risk factors being the same. For example, the odds ratio for the risk factor COPD is 2.435. This means that a patient with COPD is approximately 2.435 times as likely to die in the hospital during or after undergoing CABG or after discharge but within 30 days as a patient without COPD who has the same other significant risk factors.

For all risk factors in the table except Age, Ejection Fraction, Previous MI and Renal Failure, there are only two possibilities – having the risk factor and not having it. For example, a patient either has COPD or does not have it. Since Renal Failure is expressed in terms of Renal Failure with dialysis and without dialysis, the odds ratios are relative to patients with no dialysis prior to surgery and no pre-operative creatinine greater than 1.5 mg/dL.

Previous MI is subdivided into four groups: occurring less than six hours prior to surgery; occurring six to twenty-three hours prior to surgery; occurring one to twenty days prior to surgery; and no MI within twenty days prior to the procedure. The last range is referred to as the reference category. The odds ratios for the Previous MI ranges listed above are relative to patients who have not had a previous MI within twenty days prior to the procedure.

Ejection Fraction, which is the percentage of blood in the heart's left ventricle that is expelled when it contracts (with more denoting a healthier heart), is subdivided into five ranges (less than 20 percent, 20-29 percent, 30-39 percent, 40-49 percent and 50 percent or more). The last range is referred to as the reference category. This means that the odds ratios that appear for the other Ejection Fraction categories in the table are relative to patients with an ejection fraction of 50 percent or more. Thus, a patient with an ejection fraction less than 20 percent is about 6.052 times as likely to die in the hospital or after discharge but within 30 days as a patient with an ejection fraction of 50 percent or higher, all other significant risk factors being the same.

With regard to Age, the odds ratio roughly represents the number of times a patient who is over age 55 is more likely to die in the hospital than another patient who is one year younger all other significant risk factors being the same. Thus, a patient undergoing CABG surgery who is 63 years old has a chance of dying in the hospital or after discharge but within 30 days that is approximately 1.060 times the chance that a 62 year-old patient undergoing CABG surgery has of dying in the hospital or after discharge but within 30 days, all other risk factors being the same. All patients age 55 or under have roughly the same odds of dying in the hospital or after discharge but within 30 days if their risk factors are identical.

The Sum of Binary Risk Factors Squared is merely the square of the number of risk factors in Appendix 1 that a patient has (except age) and is used to improve the ability of the model to predict mortality.

Appendix 1: Multivariable Risk Factor Equation for CABG In-Hospital/30-Day Deaths in NYS in 2004-2006.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 55	—	0.0578	<.0001	1.060
Female Gender	27.28	0.8496	<.0001	2.339
Hemodynamic State				
Unstable	1.73	1.1266	<.0001	3.085
Ventricular Function				
Ejection Fraction				
Ejection Fraction ≥ 50%	58.41	--Reference--		1.000
Ejection Fraction < 20%	1.87	1.8004	<.0001	6.052
Ejection Fraction 20-29%	6.53	1.1445	<.0001	3.141
Ejection Fraction 30-39%	12.08	0.9551	<.0001	2.599
Ejection Fraction 40-49%	21.12	0.6790	<.0001	1.972
Previous MI				
No Previous MI within 20 days	76.39	--Reference--		1.000
Previous MI less than 6 hours	0.87	1.7050	<.0001	5.502
Previous MI 6 – 23 hours	1.34	1.0000	<.0001	2.718
Previous MI 1 – 20 days	21.41	0.6590	<.0001	1.933
Comorbidities				
COPD	18.31	0.8900	<.0001	2.435
Diabetes, Requiring Medication	35.82	0.5662	<.0001	1.762
Extensive Aortic Atherosclerosis	6.94	0.9556	<.0001	2.600
Renal Failure				
No Renal Failure	87.58	--Reference--		1.000
Renal Failure, Creatinine 1.6 -2.0 mg/dL	6.91	0.8923	<.0001	2.441
Renal Failure, Creatinine 2.1- 3.0 mg/dL	2.52	1.0587	<.0001	2.883
Renal Failure, Creatinine > 3.0 mg/dL	0.82	1.6683	<.0001	5.303
Renal Failure, Dialysis	2.17	2.2259	<.0001	9.261
Previous Open Heart Operations	3.82	1.2419	<.0001	3.462
Sum of Binary Risk Factors Squared	—	-0.0493	0.0025	0.952
Intercept = -6.4054				
C Statistic = 0.801				

Appendix 2. 2004-2006 Risk Factors For Valve Surgery In-Hospital/30-Day Mortality

The significant pre-procedural risk factors for in-hospital/30-day mortality following valve surgery in the 2004-2006 time period are presented in the table that follows.

Roughly speaking, the odds ratio for a risk factor represents the number of times a patient with that risk factor is more likely to die in the hospital during or after valve surgery or after discharge but within 30 days than a patient without the risk factor, all other risk factors being the same. For example, the odds ratio for the risk factor COPD is 1.7. This means that a patient with COPD is approximately 1.7 times as likely to die in the hospital during or after undergoing valve surgery or after discharge but within 30 days as a patient without COPD who has the same other significant risk factors.

The odds ratio for type of valve surgery represents the number of times a patient with a specific valve surgery is more likely to die in the hospital during or after that particular surgery or after discharge but within 30 days than a patient who has had aortic valve replacement surgery, all other risk factors being the same. For example, a patient who has a mitral valve replacement surgery is 1.509 times as likely to die in the hospital during or after surgery or after discharge but within 30 days as a patient with aortic valve replacement surgery, all other significant risk factors being the same.

For all other risk factors in the table except Age, Ejection Fraction and Renal Failure there are only two possibilities – having the risk factor and not having it. For example, a patient either has COPD or does not have it. Ejection Fraction, Age and Renal Failure are interpreted in the same way as previously described.

Appendix 2: Multivariable Risk Factor Equation for Valve Surgery In-Hospital/30-Day Deaths in NYS, 2004-2006.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: number of years greater than 55	—	0.0511	<.0001	1.052
Female Gender	48.63	0.4732	<.0001	1.605
Type of Valve Surgery				
Aortic Valve Replacement	46.04	--Reference--		1.000
Mitral Valve Replacement	17.38	0.4116	0.0012	1.509
Mitral Valve Repair	19.13	-0.2258	0.2068	0.798
Multiple Valve Repair/Replacement	17.45	0.8222	<.0001	2.276
Hemodynamic State				
Unstable	1.01	0.8472	0.0010	2.333
Ventricular Function				
Ejection Fraction				
Ejection Fraction \geq 40%	84.11	--Reference--		1.000
Ejection Fraction < 30 %	7.03	0.5372	0.0003	1.711
Ejection Fraction 30-39 %	8.86	0.3888	0.0047	1.475
Comorbidities				
COPD	18.08	0.5304	<.0001	1.700
Endocarditis	5.32	0.7731	<.0001	2.166
Extensive Aortic Atherosclerosis	6.35	0.4304	0.0024	1.538
Hepatic Failure	0.38	1.2828	0.0007	3.607
Renal Failure				
No Renal Failure	86.84	--Reference--		1.000
Renal Failure, Creatinine 1.6 -3.0 mg/dl	9.59	0.9062	<.0001	2.475
Renal Failure, Creatinine > 3.0 mg/dl	0.84	1.6595	<.0001	5.257
Renal Failure, Requiring Dialysis	2.73	1.4846	<.0001	4.413
Previous Open Heart Operations	18.42	0.6237	<.0001	1.866
Previous Organ Transplant	0.65	1.3583	<.0001	3.890

Intercept = -5.1348

C Statistic = 0.795

Appendix 3. 2004-2006 Risk Factors For Valve and CABG Surgery In-Hospital/30-Day Mortality

The significant pre-procedural risk factors for in-hospital/30-day mortality following valve and CABG surgery in the 2004-2006 time period are presented in the table that follows.

Roughly speaking, the odds ratio for a risk factor represents the number of times a patient with that risk factor is more likely to die in the hospital during or after valve and CABG surgery or after discharge but within 30 days than a patient without the risk factor, all other risk factors being the same. For example, the odds ratio for the risk factor COPD is 1.392. This means that a patient with COPD is approximately 1.392 times as likely to die in the hospital during or after undergoing valve and CABG surgery or after discharge but within 30 days as a patient without COPD who has the same other significant risk factors. Female Gender, Endocarditis, Extensive Aortic Atherosclerosis, Peripheral Vascular Disease and Previous Open Heart Operations are also interpreted in this way. The interpretation for Ejection Fraction and Renal Failure is similar to that described in Appendix 1.

The odds ratio for Type of Valve with CABG surgery represents the number of times a patient with a specific Valve with CABG surgery is more likely to die in the hospital during or after that particular surgery or after discharge but within 30 days than a patient who has had aortic valve repair or replacement and CABG surgery, all other risk factors being the same. For

example, a patient who has a mitral valve replacement and CABG surgery is 2.006 times as likely to die in the hospital during or after surgery as a patient with aortic valve repair or replacement and CABG surgery, all other significant risk factors being the same.

The interpretation for Age is similar to that described in Appendix 1. In this case, the odds ratio for age roughly represents the number of times a patient who is over age 65 is more likely to die in the hospital or after discharge but within 30 days than another patient who is one year younger with all the other significant risk factors the same.

Body surface area is a function of height and weight and is a proxy for vessel size. Since larger vessels are easier to work with, the odds ratio for Body Surface Area indicates that for each additional unit of body surface area, the odds of dying in the hospital or after discharge but within 30 days is only 0.562 times the odds for someone with a body surface area one unit smaller, all other risk factors being the same.

Previous MI is subdivided into three groups (occurring less than 24 hours prior to the procedure, one to twenty days prior to the procedure, and no MI within twenty days prior to the procedure). The last range is referred to as the reference category. The odds ratios for the Previous MI ranges listed are relative to patients who have not had an MI within twenty days prior to the procedure.

Appendix 3: Multivariable Risk Factor Equation for Valve and CABG Surgery In-Hospital/30-Day Deaths in NYS, 2004-2006.

	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 65	—	0.0549	<.0001	1.056
Body Surface Area	—	-0.5765	0.0039	0.562
Female Gender	38.64	0.3496	0.0003	1.419
Type of Valve (with CABG)				
Aortic Valve Repair/Replacement	54.50	---Reference---		1.000
Mitral Valve Replacement	13.57	0.6963	<.0001	2.006
Mitral Valve Repair	20.98	0.4182	0.0005	1.519
Multiple Valve Repair/Replacement	10.96	0.9474	<.0001	2.579
Ventricular Function				
Ejection Fraction				
Ejection Fraction \geq 40%	71.28	---Reference---		1.000
Ejection Fraction < 20 %	3.81	0.6970	0.0002	2.008
Ejection Fraction 20-29 %	10.90	0.5456	<.0001	1.726
Ejection Fraction 30-39 %	14.01	0.3832	0.0010	1.467
Previous MI				
No MI within 20 days	85.27	---Reference---		1.000
Previous MI < 24 hours	0.87	1.7726	<.0001	5.886
Previous MI 1 - 20 days	13.86	0.2388	0.0328	1.270
Comorbidities				
COPD	24.71	0.3306	0.0003	1.392
Endocarditis	1.49	0.6905	0.0083	1.995
Extensive Aortic Atherosclerosis	11.67	0.3991	0.0005	1.490
Peripheral Vascular Disease	12.81	0.4693	<.0001	1.599
Renal Failure				
No Renal Failure	80.85	---Reference---		1.000
Renal Failure, Creatinine 1.6 -2.0 mg/dL	10.60	0.4242	0.0005	1.528
Renal Failure, Creatinine 2.1- 3.0 mg/dL	4.10	0.5779	0.0008	1.782
Renal Failure, Creatinine > 3.0 mg/dL	1.08	0.8593	0.0037	2.362
Renal Failure Requiring Dialysis	3.38	1.4944	<.0001	4.457
Previous Open Heart Operations	8.73	0.7044	<.0001	2.023
Intercept		=-3.1986		
C Statistic		= 0.747		

NEW YORK STATE CARDIAC SURGERY CENTERS

Albany Medical Center Hospital
New Scotland Avenue
Albany, New York 12208

Arnot Ogden Medical Center
600 Roe Avenue
Elmira, New York 14905

Bellevue Hospital Center
First Avenue and 27th Street
New York, New York 10016

Beth Israel Medical Center
10 Nathan D. Perlman Place
New York, New York 10003

Buffalo General Hospital
100 High Street
Buffalo, New York 14203

Champlain Valley Physicians Hospital
Medical Center
75 Beekman Street
Plattsburgh, New York 12901

Columbia Presbyterian Medical Center
– NY Presbyterian
161 Fort Washington Avenue
New York, New York 10032

Ellis Hospital
1101 Nott Street
Schenectady, New York 12308

Erie County Medical Center
462 Grider Street
Buffalo, New York 14215

Good Samaritan Hospital of Suffern*
255 Lafayette Avenue
Suffern, New York 10901

Lenox Hill Hospital
100 East 77th Street
New York, New York 10021

Long Island Jewish
Medical Center
270-05 76th Avenue
New Hyde Park, New York 11040

Maimonides Medical Center
4802 Tenth Avenue
Brooklyn, New York 11219

Mary Imogene Bassett Healthcare
Atwell Road
Cooperstown, New York 13326

Mercy Hospital
565 Abbot Road
Buffalo, New York 14220

Millard Fillmore Hospital
3 Gates Circle
Buffalo, New York 14209

Montefiore Medical Center
Henry & Lucy Moses Division
111 East 210th Street
Bronx, New York 11219

Montefiore Medical Center-
Weiler Hospital of
A. Einstein College
1825 Eastchester Road
Bronx, New York 10461

Mount Sinai Medical Center
One Gustave L. Levy Place
New York, New York 10019

NYU Hospitals Center
550 First Avenue
New York, New York 10016

New York Hospital Medical
Center-Queens
56-45 Main Street
Flushing, New York 11355

New York Methodist Hospital
506 Sixth Street
Brooklyn, New York 11215

North Shore University Hospital
300 Community Drive
Manhasset, New York 11030

Rochester General Hospital
1425 Portland Avenue
Rochester, New York 14621

St. Elizabeth Medical Center
2209 Genesee Street
Utica, New York 13413

St. Francis Hospital
Port Washington Boulevard
Roslyn, New York 11576

St. Joseph's Hospital
Health Center
301 Prospect Avenue
Syracuse, New York 13203

St. Luke's Roosevelt
Hospital Center
11-11 Amsterdam Avenue at
114th Street
New York, New York 10025

St. Peter's Hospital
315 South Manning Boulevard
Albany, New York 12208

SVCMC - St. Vincent's Manhattan
Center of NY
153 West 11th Street
New York, New York 10011

Staten Island
University Hospital – North
475 Seaview Avenue
Staten Island, New York 10305

Strong Memorial Hospital
601 Elmwood Avenue
Rochester, New York 14642

United Health Services
Wilson Hospital Division
33-57 Harrison Street
Johnson City, New York 13790

University Hospital at Stony Brook
SUNY Health Science Center at
Stony Brook
Stony Brook, New York 11794-8410

University Hospital of Brooklyn
450 Lenox Road
Brooklyn, New York 11203

University Hospital SUNY Health
Sciences Center
750 East Adams Street
Syracuse, New York 13210

Vassar Brother's Medical Center
45 Reade Place
Poughkeepsie, New York 12601

Weill-Cornell Medical Center –
NY Presbyterian
525 East 68th Street
New York, New York 10021

Westchester Medical Center
Grasslands Road
Valhalla, New York 10595

Winthrop University Hospital
259 First Street
Mineola, New York 11501

*Did not perform cardiac surgery until
after 2006.

Additional copies of this report may be obtained through the Department of Health web site at <http://www.health.state.ny.us> or by writing to:

Cardiac
Box 2004
New York State Department of Health
Albany, New York 12220



State of New York
David A. Paterson, Governor
Department of Health
Richard F. Daines, M.D., Commissioner