Pennsylvania's Guide to CORONARY ARTERY BYPASS GRAFT SURGERY

2000

Information about hospitals and cardiothoracic surgeons

PHC4

Pennsylvania Health Care Cost Containment Council
May 2002

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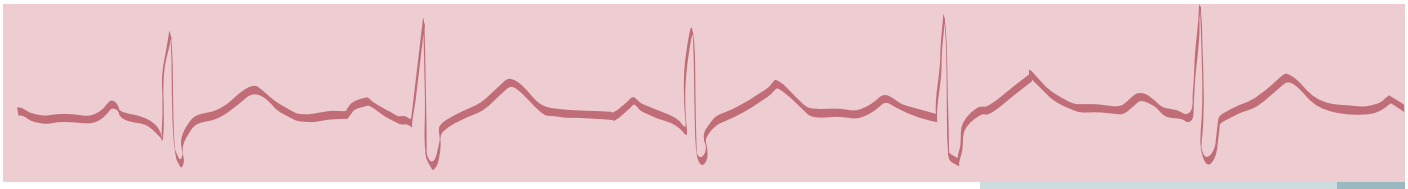
The Pennsylvania Health Care Cost Containment Council (PHC4) was established as an independent state agency by the General Assembly and the Governor of the Commonwealth of Pennsylvania in 1986. To help improve the quality and restrain the cost of health care, PHC4 promotes health care competition through the collection, analysis and public dissemination of uniform cost and quality-related information.



Key Findings

- Patient mortality following coronary artery bypass graft (CABG) surgery in Pennsylvania hospitals was 13% lower in calendar year 2000 than in 1995, the last year of PHC4-reported CABG data.
- The likelihood of in-hospital mortality was lower for patients treated by surgeons who performed over 115 open heart procedures per year. A hospital's volume of cases was not a significant factor in mortality.
- Fifty-five Pennsylvania hospitals performed CABG surgery in 2000 – 14 began performing this type of surgery after 1995. *There were no statistically significant differences in outcomes (in-hospital mortality, 30-day mortality, 7-day or 30-day readmissions, or post-surgical length of stay) between these 14 hospitals and those with more experience.*
- 27,446 open heart procedures were performed in 2000 – only a slight increase over 1995 figures. The average hospital volume decreased from 634 to 499 procedures during that same period. The average number of procedures per surgeon was the same (149) in both 1995 and 2000.
- There was wide variation in readmission rates for both hospitals and surgeons. 7-day readmission rates for hospitals ranged from 2.7% to 14.0%. For surgeons, the range was 1.2% to 18.2%. For 30-day readmission rates, the range for hospitals was 9.7% to 26.5%, and the range for surgeons was 4.7% to 27.5%.
- The top two reasons for patient readmissions were infection and heart failure.
- Since 1995, the average post-surgical lengths of stay decreased by 12.3%. In general, patients treated by surgeons with higher volumes of procedures had shorter lengths of stay.

Understanding this Report

What is Coronary Artery Bypass Graft Surgery?

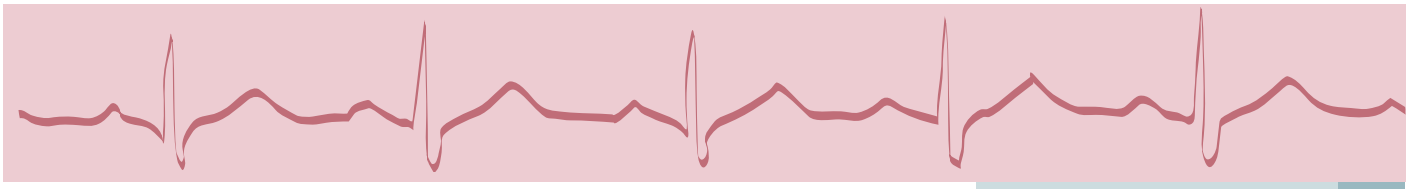
Coronary artery bypass graft (CABG) surgery is a surgical procedure used to treat patients with blockages in the coronary arteries. During the procedure, a surgeon creates an alternate path for blood to flow to the heart muscle by going around, or bypassing, a blocked section of an artery. CABG (pronounced "cabbage") is invasive surgery that is typically recommended for severe blockages that are not treatable by other methods. The surgeon gains access to the heart by cutting the sternum (breast bone). Blood vessels are removed from the patient's leg or detached from the chest wall and "grafted" to the blocked artery. Once the grafts have been attached, blood will flow through the new bypass vessel, avoiding the blockage completely.

CABG is performed by a cardiothoracic surgeon under general anesthesia and generally takes between two and six hours depending on the number of bypasses to be completed (patients might have more than one blockage, so several bypasses may be needed). After the procedure is completed, most patients stay in the hospital for several days and face a rehabilitation period of about one to two months.

Why is it important to look at CABG surgery?

CABG surgery is a frequently performed and costly surgery. Each year, over 20,000 CABG surgeries are performed in Pennsylvania hospitals at an average charge of approximately $60,000.

While most CABG patients have an excellent prognosis for survival, results following surgery may vary among hospitals and surgeons, so it is important to monitor the performance of Pennsylvania hospitals and surgeons who perform CABG surgery. There is evidence that the information contained in reports such as this encourages hospitals and surgeons to examine their processes and make changes that can improve quality of care and, ultimately, save lives.



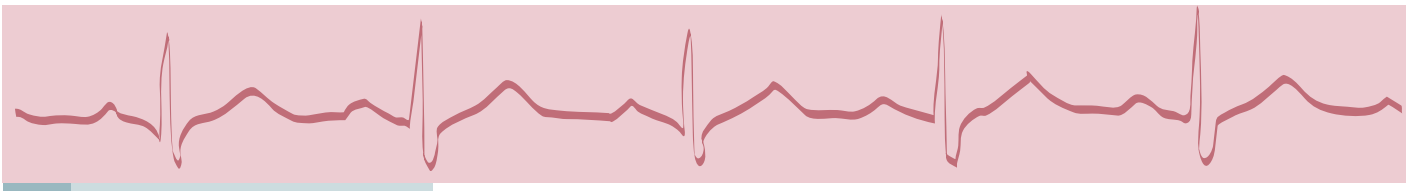
New measures in this report

Several new measures are being included in this report for the first time. These measures include 30-day mortality and 7-day and 30-day readmission rates. As with the first time any new measures are examined, the information should be viewed with caution. In addition, readers are also cautioned that the ability to predict events decreases over time and should be considered when examining measures that deal with outcomes up to 30 days after CABG surgery. Finally, while these new measures may provide valuable information, it is important to recognize that this report was an initial attempt to report these new measures and that the risk-adjustment methodology will continue to be reviewed.

PHC4's Technical Advisory Group includes a variety of experts in areas such as medicine, statistics, and health economics. As is customary, the Technical Advisory Group was consulted for this report and in-depth discussions were held on including, in particular, 30-day mortality and 30-day readmission information in this report. While the majority of Technical Advisory Group members voted favorably on the inclusion of these measures, there were dissenting opinions. It should, therefore, be understood that the inclusion of 30-day mortality and 30-day readmission rates represented the majority, and not unanimous, vote of the Technical Advisory Group. These measures are discussed further on page 6.

What is measured in this report and why are these measures important?

This report includes information on the number of surgeries performed, mortality (death) rates during the hospital stay or within 30-days following the surgery, readmission rates within 7 or 30 days, and data on post-surgical lengths of stay. This information is reported for the 55 hospitals and 182 surgeons who performed CABG surgery on adult patients in 2000. In addition, average charge is reported for hospitals. These measures were chosen because they are important components in examining quality of care. Further, they can be reliably measured and compared across hospitals. Other quality of care measures, such as complications following surgery, are important as well but are more difficult to evaluate.



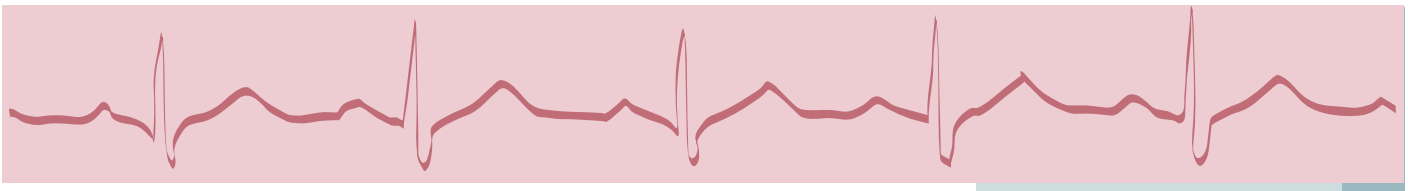
Number of cases – This is the number of CABG surgeries analyzed in this report. This figure gives an idea of the experience the hospitals and surgeons have in treating CABG patients. It is important to note, however, that some CABG patients were not counted in this analysis (for example, those that underwent other complex procedures during the same hospital admission as the CABG surgery), so the actual number of cases that a hospital or surgeon treated might be higher.

In-hospital mortality – This measure represents the number of patients who died during the hospital stay in which the CABG surgery was performed.

30-day mortality – This measure represents the number of patients who died within 30 days of the date of their CABG surgery regardless of "where" the patient died. This measure is important because it includes, for example, those patients who may have been discharged from the hospital but died after returning home.

7-day and 30-day hospital readmissions – Some patients are discharged from the hospital following CABG surgery and are then readmitted at a later date. For this analysis, readmissions were counted only if the patient was readmitted for particular reasons (as indicated by the principal diagnosis of the patient during the readmission; examples include infections, other heart-related conditions, etc.). This report examines how often patients were readmitted to a Pennsylvania hospital within 7 days or 30 days of being discharged from the hospital where the CABG surgery was performed. Readmission rates are important from both a quality of care and cost standpoint. While some readmissions will always occur, high quality care may lessen the need for subsequent hospitalizations.

Information on both 7-day and 30-day readmissions is reported because the reasons for readmission may vary across these time periods. 7-day readmissions account for those readmissions that are closer in time to the initial hospitalization and may be more directly tied to the CABG surgery. At the same time, particular complications may occur after the first 7 days, so adding 30-day readmission rates provides a more completed picture.



While much of the scientific literature has focused primarily on 30-day readmission rates, readmissions this far away from the discharge may or may not reflect the care a patient received during the CABG surgery (e.g., a health complication unrelated to the surgery could have developed within the 30 days and necessitated hospitalization).

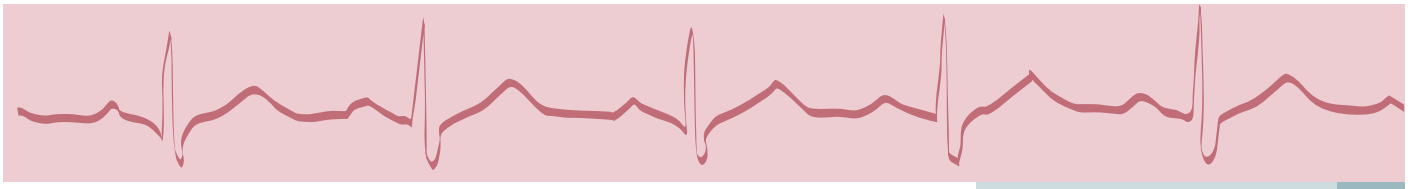
Post-surgical length of stay – This measure represents how long a patient stayed in the hospital after undergoing CABG surgery. How long a patient stays in the hospital may reflect upon the success of the treatment. While complications following surgery were not examined for this report, other analysis has shown that complications following CABG surgery add to the length of time a patient stays in the hospital. At the same time, it is important to note that various approaches to CABG surgery might affect length of stay. For example hospitals that perform an "off-pump" approach to CABG surgery might have different lengths of stay than the hospitals that do not use this approach. Length of stay is reported in average days instead of a statistical rating that indicates whether the length of stay was significantly longer or shorter than expected. Unlike other measures (such as mortality where a lower number of deaths is obviously better than a higher number), it is not known whether shorter lengths of stay are better than longer lengths of stay or vice versa. Reporting the average length of stay in days, therefore, presents information that can be used to examine differences in lengths of stay without taking a position on what is "best."

Hospital charges – The amount a hospital bills for a patient's care is known as the charge. The charges do not include professional fees (e.g., physician fees) or other additional post-discharge costs, such as rehabilitation treatment, long term care and/or home health care. Hospitals generally do not receive full reimbursement of their charges because insurance companies or other large purchasers of health care services generally negotiate discounts with hospitals. The amount collected by the hospital, therefore, may differ substantially from the charge. Hospital charges often vary by regions of the state. Despite their limitations, charges are a commonly reported surrogate for health care costs.

Uses of the report

This report can be used as a tool to examine hospital and surgeon performance for CABG surgery. It is not intended to be a sole source of information in making decisions about CABG surgery, nor should it be used to generalize about the overall quality of care provided by a hospital or a surgeon. Readers of this report should use it in discussions with their physicians who can answer specific questions and concerns about CABG surgery.

- **Patients/consumers** can use this report to aid in making decisions about where and with whom to seek treatment involving CABG surgery. This report should be used *in conjunction* with a physician or other health care provider when making decisions about CABG surgery.
- **Group benefits purchasers/insurers** can use this report as part of a process in determining which hospitals and surgeons provide quality care for employees, subscribers, members, or participants who need CABG surgery.
- **Health care providers** can use this report as an aid in identifying opportunities for quality improvement and cost containment.
- **Policy makers/public officials** can use this report to enhance their understanding of health care issues, to ask insightful questions, to raise public awareness of important issues and to help constituents identify quality health care options.
- **Everyone** can use this information to raise important questions about why differences exist in the quality and efficiency of care.



Where does the data come from?

Pennsylvania hospitals are required by law to submit certain information to PHC4. The data used for this analysis was submitted to PHC4 by hospitals in Pennsylvania that perform CABG surgery. It encompasses inpatient hospital discharges from January 1, 2000 to December 31, 2000 in which the patient underwent CABG surgery. The data was subject to verification processes by PHC4 and was verified for accuracy by hospitals and surgeons. In addition, hospitals are required to submit data indicating in simple terms "how sick the patient was on admission." This information is used to make sure that differences in the illness level of patients are accounted for when reporting information on CABG surgery.

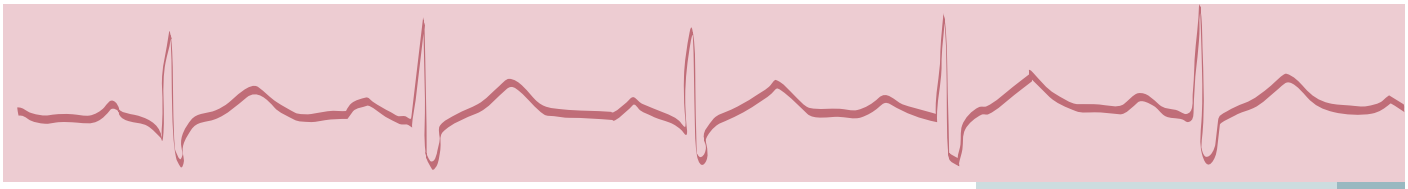
Accounting for high-risk patients

Some patients who undergo CABG surgery are more seriously ill than others. In order to report fair comparisons among hospitals and surgeons, PHC4 developed a complex mathematical formula to "risk-adjust" the data, meaning that hospitals and surgeons receive "extra credit" for operating on patients that are more seriously ill or at a greater risk than others. Risk-adjusting the data is important because sicker patients might be more likely to die following CABG surgery, be readmitted, or stay in the hospital longer. A comprehensive description of how these adjustments are made can be found in the *Research Methods and Results* document that accompanies this report. It can be found on PHC4's Web site at www.phc4.org.

What do the symbols mean?

The symbols in this report represent the "bottom line" results of hospitals and surgeons who performed CABG surgery. A statistical test is done to determine whether differences in the results are simply due to chance or random variation. A difference is called "statistically significant" when we are 95 percent confident that the difference is not likely to result from chance or random variation. Using in-hospital mortality as an example:

- ○ lower than expected (meaning that the hospital or surgeon had fewer deaths than expected after accounting for how sick the patients were in that hospital)
- ⊙ same as expected (meaning that the hospital or surgeon had as many deaths as expected after accounting for how sick the patients were in that hospital)
- ● higher than expected (meaning that the hospital or surgeon had more deaths than expected after accounting for how sick the patients were in that hospital)



Statewide Highlights

Measures such as mortality, readmissions, and length of stay are important components in evaluating quality of care for CABG surgery, and reporting these measures for hospitals and surgeons provides specific information that can be used in making health care decisions.

At the same time, a more general evaluation can shed light on how these and other measures play a role in CABG surgery. The following points summarize additional analyses conducted for this report. These findings represent preliminary steps in evaluating these types of relationships and require further study and evaluation.

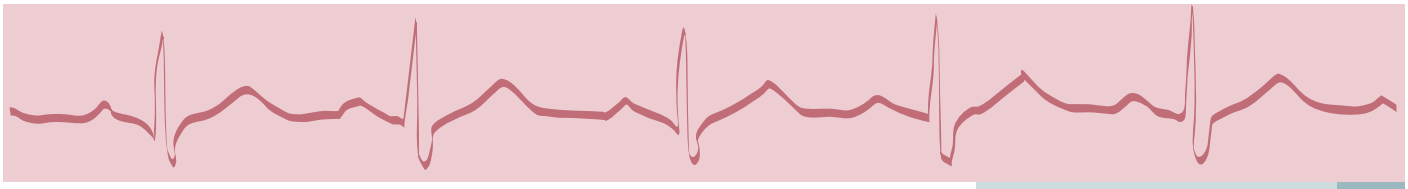
Statewide Figures for CABG Surgery

In-hospital mortality rate	2.4%
30-day mortality rate	2.7%
7-day readmission rate	6.2%
30-day readmission rate	14.5%
Average post-surgical length of stay	5.8 days
Average hospital charge	$59,939

Open Heart Surgery Volume for Hospitals and Surgeons

- Studies have indicated that procedure volume is associated with better outcomes. For this evaluation, the volume of procedures refers to total *open heart procedures, including CABG surgery*.
- The number of open-heart procedures performed in Pennsylvania hospitals has remained relatively constant since 1995. In 2000, 27,446 procedures were performed – only a slight increase over the 27,264 procedures performed in 1995. The average hospital volume decreased from 634 procedures in 1995 to 499 procedures in 2000. The average surgeon volume was the same (149 procedures) in both 1995 and 2000.
- For this analysis, surgeon volume was a significant determinant of patient survival, readmission rates, and post-surgical length of stay – after accounting for patient risk. Specific findings are discussed below.
- **Surgeon volume and mortality.** Surgeon volume was a more important predictor than hospital volume of whether a patient died in the hospital or within 30 days of the CABG surgery. This confirms results from PHC4's 1994/1995 CABG report in which surgeon volume was found to be an important determinant of in-hospital mortality, when, in general, higher volume was associated with increased survival.

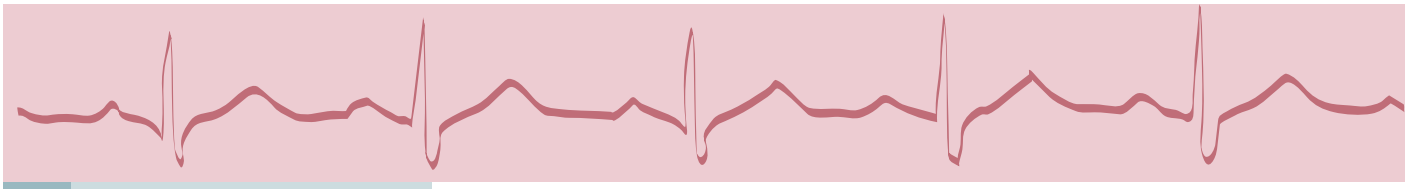
  In this 2000 report, the likelihood of in-hospital mortality increased as the number of procedures performed by a surgeon increased, up to 115 procedures per year. As the number of procedures increased to more than 115 per year, the likelihood of in-hospital mortality decreased. For example, patients treated by surgeons who performed 200 procedures per year were 9% less likely to die in the hospital than patients treated by surgeons who performed 115 procedures per year. A similar pattern was seen with regard to 30-day post-surgical mortality. For example, patients treated by surgeons who performed 200 procedures per year were 12% less likely to die within 30 days than patients treated by surgeons who performed 92 procedures per year.



- **Surgeon volume and readmissions.** Surgeon volume was a more important predictor than hospital volume of whether a patient was readmitted within 30 days of the CABG surgery. (Surgeon volume was not a significant predictor of readmission within 7 days). The likelihood of a patient being readmitted within 30 days of the CABG surgery decreased as the number of procedures performed by a surgeon increased, up to 190 procedures per year. For example, patients treated by surgeons who performed 190 procedures per year were 6% less likely to be readmitted within 30 days than patients treated by surgeons who performed 100 procedures per year. However, as the number of procedures increased over 190 per year, the likelihood of readmission increased.
- **Surgeon volume and length of stay.** In general, patients treated by surgeons with higher volume had shorter post-surgical lengths of stay.

Surgeon Experience

- On average, the surgeons in this report had 13 years of experience performing open heart surgery.
- After accounting for patient risk, the number of years of experience surgeons had in performing open heart surgery was an important predictor in patient survival (both in-hospital and within 30-days of the surgery), the likelihood of readmission (for both 7-day and 30-day readmissions), and post-operative length of stay. Details of these findings are discussed below.
- **Surgeon experience and mortality.** Patients treated by surgeons with 8 years of experience were less likely to die in the hospital than patients treated by surgeons with less experience. Mortality increased, however, as surgeon experience increased beyond 8 years (up to approximately 23 years of experience). In-hospital mortality began to decrease for patients treated by surgeons with more than 23 years of experience. A similar pattern was seen with regard to 30-day mortality rates.



- **Surgeon experience and readmissions.** The likelihood of a patient being readmitted increased for less experienced surgeons (up to, and including, about five years of experience) and then decreased among more experienced surgeons (those with roughly 6 to 21 years of experience). For example, patients who were treated by surgeons with 21 years of experience were 10% less likely to be readmitted within 30 days than patients treated by surgeons with only five years of experience. Once surgeons had over 21 years of experience, the likelihood of readmission again began to increase. For example, patients treated by surgeons with 30 years of experience were 14% more likely to be readmitted within 30 days than patients treated by surgeons with 21 years of experience. A similar pattern was seen with regard to readmissions for infections.
- **Surgeon experience and length of stay.** As surgeon experience increased, up to 10 years of experience, length of stay decreased. Length of stay increased, however, for patients treated by surgeons with 10 to 25 years of experience and decreased for surgeons with more than 25 years of experience.

Top Reasons for Readmission

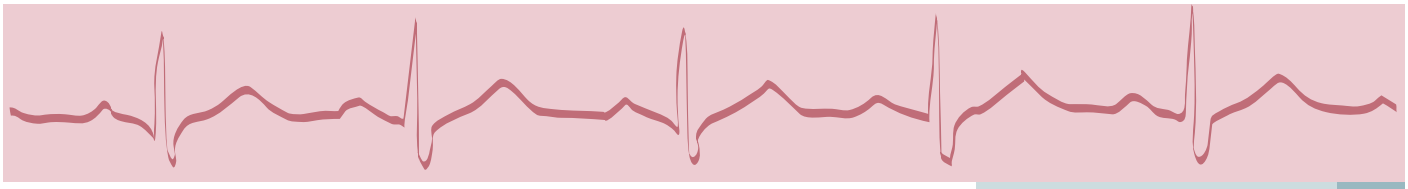
The top five reasons patients were readmitted to a hospital after CABG surgery were:

Reason for Readmission	Percent of Readmissions Within 7 days	Percent of Readmissions Within 30 days
Heart failure	20.5%	19.6%
Infections	18.0%	23.4%
Other surgical complications	11.5%	8.2%
Heart rhythm irregularities	9.9%	8.8%
Respiratory and chest symptoms	5.3%	5.6%

Total charges for readmissions within 7 days and 30 days were over $25 million and $53 million, respectively.

Length of Stay and Readmissions

- In general, patients with longer post-surgical lengths of stay were more likely to be readmitted within 7 or 30 days of CABG surgery. Patients with longer post-surgical lengths of stay were also more likely to be readmitted to the hospital for an infection than patients with shorter lengths of stay.



The Number of Hospital Affiliations

- The percent of surgeons performing open-heart surgery in multiple hospitals has increased since 1995. In 2000, 47% of the surgeons performed open-heart surgery in more than one hospital; in 1995, this figure was 33%.
- The number of hospitals in which a surgeon performed CABG surgery was a significant predictor of the likelihood of a patient being readmitted, after accounting for patient risk. Patients were more likely to be readmitted to the hospital after CABG surgery if they were treated by surgeons affiliated with more than one hospital. As the number of hospital affiliations rose, so did the likelihood of both 7-day and 30-day readmissions.

More Data on PHC4's Web site

Additional information is posted on the PHC4 Web site at **www.phc4.org**:

- Numbers behind the outcome figures and symbols
- Research methods and results
- Other descriptive information

HOSPITAL DATA

Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **	Average Charges
		In-Hospital	30-Day	7-Day	30-Day		
Abington Memorial	264	⊙	⊙	⊙	⊙	6.3	$102,228
Albert Einstein	206	⊙	⊙	⊙	⊙	5.8	$89,510
Allegheny General	642	⊙	⊙	⊙	⊙	6.9	$55,533
Altoona	355	⊙	⊙	⊙	●	4.4	$39,411
Bon Secours Holy Family *	61	⊙	⊙	⊙	⊙	5.5	$47,112
Butler Memorial	237	⊙	⊙	⊙	⊙	5.9	$32,143
Community/Scranton	229	○	○	⊙	⊙	6.4	$52,420
Conemaugh Valley Memorial	353	⊙	⊙	⊙	⊙	5.0	$46,291
Crozer-Chester	194	⊙	⊙	⊙	⊙	5.7	$123,916
Doylestown *	81	⊙	⊙	⊙	⊙	6.2	$48,800
Easton	143	⊙	⊙	⊙	⊙	4.8	$52,583
Frankford	247	⊙	⊙	⊙	⊙	5.4	$77,317
Geisinger/Danville	464	⊙	⊙	⊙	⊙	4.8	$37,393
Graduate	138	⊙	⊙	⊙	●	5.0	$123,558
Hahnemann University	422	⊙	⊙	⊙	⊙	7.0	$124,441
Hamot	568	⊙	⊙	⊙	⊙	5.1	$43,909
Hosp of the Univ of PA	264	⊙	⊙	⊙	⊙	6.0	$100,237
Lancaster General	467	⊙	⊙	⊙	⊙	5.4	$28,269
Lancaster Regional	161	⊙	⊙	⊙	⊙	6.6	$48,584
Lehigh Valley	880	⊙	⊙	○	○	5.7	$49,873
Main Line/Bryn Mawr	425	●	●	⊙	⊙	5.9	$62,864
Main Line/Lankenau	672	⊙	⊙	○	⊙	6.5	$67,719
Medical Center/Beaver	322	⊙	⊙	⊙	⊙	6.1	$44,620
Medical College of PA	130	⊙	⊙	⊙	●	5.2	$107,486
Mercy/Fitzgerald	136	⊙	⊙	●	⊙	5.6	$58,945
Mercy/Pittsburgh	445	⊙	⊙	⊙	⊙	6.8	$55,295
Mercy/Scranton	253	⊙	⊙	⊙	⊙	6.1	$43,462
Mercy/Wilkes-Barre	228	⊙	⊙	⊙	⊙	4.7	$51,729

* Began performing CABG surgery during 2000.

** Length of stay is the average number of days spent in the hospital following the CABG surgery, after accounting for patient risk.

○ Lower than expected
⊙ Same as expected
● Higher than expected

HOSPITAL DATA

Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **	Average Charges
		In-Hospital	30-Day	7-Day	30-Day		
Milton S Hershey	297	⊙	⊙	⊙	⊙	5.1	$36,707
Pennsylvania Hospital	168	⊙	⊙	⊙	⊙	6.4	$97,762
Pinnacle Health	899	●	●	⊙	⊙	6.0	$45,120
Presbyterian/Univ of PA	356	⊙	⊙	⊙	⊙	6.4	$88,963
Reading	425	●	⊙	○	○	6.1	$36,724
Robert Packer	375	⊙	⊙	⊙	⊙	4.8	$29,042
Sacred Heart/Allentown	137	⊙	⊙	⊙	⊙	5.8	$48,232
Saint Francis/Pittsburgh	638	⊙	⊙	⊙	⊙	5.6	$33,555
Saint Joseph/Reading	187	⊙	⊙	⊙	⊙	6.1	$36,056
Saint Mary	273	⊙	⊙	⊙	⊙	7.2	$68,893
Saint Vincent	637	⊙	⊙	⊙	⊙	5.4	$44,268
Sharon Regional *	44	⊙	⊙	⊙	⊙	5.4	$45,285
St Luke's/Bethlehem	466	⊙	⊙	⊙	⊙	5.3	$51,227
St. Clair Memorial	223	⊙	⊙	⊙	⊙	5.2	$38,828
Temple University	303	●	⊙	⊙	●	7.2	$118,110
Temple/Lower Bucks	109	⊙	⊙	⊙	⊙	6.7	$62,923
Thomas Jefferson Univ	444	⊙	⊙	⊙	⊙	7.1	$108,909
UPMC Lee Regional	124	⊙	●	⊙	●	4.9	$37,031
UPMC Passavant	185	⊙	⊙	⊙	⊙	6.2	$57,510
UPMC Presbyterian	733	○	○	●	●	5.0	$91,116
UPMC Shadyside	894	⊙	⊙	⊙	⊙	6.7	$82,058
Washington	262	⊙	⊙	⊙	⊙	5.7	$55,160
Western Pennsylvania	657	⊙	⊙	●	●	5.9	$64,813
Westmoreland Regional	313	⊙	⊙	⊙	⊙	5.5	$39,585
Williamsport	240	⊙	⊙	⊙	⊙	4.7	$38,190
WVHCS-Hospital	494	⊙	⊙	⊙	⊙	5.9	$42,738
York	411	○	○	⊙	⊙	5.2	$38,152
Statewide	19,281					5.8	$59,939

* Began performing CABG surgery during 2000.

** Length of stay is the average number of days spent in the hospital following the CABG surgery, after accounting for patient risk.

○ Lower than expected
⊙ Same as expected
● Higher than expected

SURGEON DATA

Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Acker, Michael A.	98	⊙	⊙	⊙	⊙	6.1
Hosp of the Univ of PA	56	⊙	⊙	⊙	⊙	5.9
Presbyterian/Univ of PA	42	⊙	NR	NR	NR	6.3
Addonizio, V. Paul						
Abington Memorial	120	●	⊙	⊙	⊙	6.7
Alpern, Jeffrey *	147	⊙	⊙	⊙	⊙	5.7
St Luke's/Bethlehem	145	⊙	⊙	⊙	⊙	5.7
Anastasi, John S. *	135	⊙	⊙	⊙	●	4.1
Altoona	126	⊙	⊙	⊙	●	4.1
Aufiero, Thomas X.						
Williamsport	91	⊙	⊙	⊙	⊙	4.6
Bavaria, Joseph E. *	61	⊙	⊙	⊙	⊙	6.3
Hosp of the Univ of PA	41	⊙	NR	NR	NR	6.1
Benckart, Daniel H. *	48	⊙	⊙	⊙	⊙	6.3
Allegheny General	44	⊙	⊙	⊙	⊙	6.4
Bennett, Robert D.	170	⊙	⊙	⊙	⊙	6.5
Western Pennsylvania	86	⊙	⊙	⊙	⊙	6.0
UPMC Shadyside	84	⊙	⊙	⊙	⊙	6.9
Benoit, Charles H.						
Geisinger/Danville	120	⊙	⊙	⊙	⊙	4.7
Boova, Robert S. *	158	⊙	⊙	⊙	⊙	5.7
Main Line/Bryn Mawr	157	⊙	⊙	⊙	⊙	5.7
Boris, Walter J.						
Mercy/Wilkes-Barre	101	⊙	⊙	⊙	⊙	4.6
Boylston, Bedford F.						
Pinnacle Health	75	⊙	⊙	⊙	⊙	6.3
Bridges, Charles R. *	146	⊙	⊙	⊙	⊙	6.6
Pennsylvania Hospital	139	⊙	⊙	⊙	⊙	6.5
Burkholder, John A. *	73	⊙	⊙	⊙	⊙	7.4
Allegheny General	69	⊙	⊙	⊙	⊙	7.5
Burlingame, Mark W. *	170	⊙	⊙	○	⊙	5.6
Lancaster General	141	⊙	⊙	○	⊙	5.5

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⊙ Same as expected
● Higher than expected
NR Not rated (too few cases)

SURGEON DATA

Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Butler, Michael D.						
Saint Vincent	155	⊙	⊙	●	⊙	5.4
Campbell, David B.						
Milton S Hershey	55	⊙	⊙	⊙	⊙	5.7
Cardone, John C.						
Westmoreland Regional	150	⊙	⊙	⊙	⊙	5.7
Carter, Thomas *	129	⊙	⊙	⊙	⊙	4.8
Easton	125	⊙	⊙	⊙	⊙	4.8
Casey, Kevin *	89	⊙	⊙	⊙	⊙	6.9
Main Line/Lankenau	51	⊙	⊙	⊙	⊙	7.8
Mercy/Fitzgerald	37	⊙	⊙	●	⊙	5.9
Cavarocchi, Nicholas C.						
Mercy/Wilkes-Barre	127	⊙	⊙	⊙	⊙	4.8
Cilley, Jonathan						
Temple/Lower Bucks	34	⊙	⊙	⊙	⊙	6.9
Cimochowski, George *	111	⊙	⊙	⊙	⊙	6.1
WVHCS-Hospital	110	⊙	⊙	⊙	⊙	6.1
Crescenzo, Donald G. *	47	⊙	⊙	⊙	⊙	5.6
St Luke's/Bethlehem	43	⊙	⊙	⊙	⊙	5.6
Crouch, Ray D. *	93	⊙	⊙	⊙	⊙	5.4
Saint Francis/Pittsburgh	87	⊙	⊙	⊙	⊙	5.3
Culig, Michael H.	155	⊙	⊙	⊙	⊙	6.0
Western Pennsylvania	78	⊙	⊙	⊙	⊙	5.5
UPMC Shadyside	77	⊙	⊙	⊙	⊙	6.5
Darrell, John C. *	142	⊙	⊙	⊙	⊙	6.2
UPMC Passavant	138	⊙	⊙	⊙	⊙	6.2
Davis, Paul K.						
Main Line/Bryn Mawr	162	⊙	⊙	⊙	⊙	5.7
Davliakos, George P. *	126	⊙	⊙	⊙	⊙	6.1
Butler Memorial	125	⊙	⊙	⊙	⊙	6.1
Deshpande, Anil S.						
Saint Mary	138	⊙	⊙	⊙	⊙	7.2

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SURGEON DATA

Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Devineni, Rajsekhar *	168	⊙	⊙	⊙	⊙	5.0
Conemaugh Valley Memorial	163	⊙	⊙	⊙	⊙	5.0
Diehl, James T. *	169	⊙	⊙	⊙	⊙	6.9
Thomas Jefferson Univ	168	⊙	⊙	⊙	⊙	6.9
DiMarco, Jr., Ross F. *	160	⊙	⊙	⊙	⊙	6.6
Mercy/Pittsburgh	159	⊙	⊙	⊙	⊙	6.6
Edie, Richard N.						
Thomas Jefferson Univ	92	⊙	⊙	⊙	⊙	7.0
El-Khatib, Hazem	143	⊙	⊙	⊙	⊙	5.7
Butler Memorial	108	⊙	⊙	⊙	⊙	5.6
UPMC Passavant	35	⊙	⊙	⊙	⊙	5.8
Fall, Stephen M.						
Reading	141	●	⊙	⊙	⊙	6.3
Fazi, Burt *	168	⊙	⊙	●	⊙	4.6
Altoona	162	⊙	⊙	●	⊙	4.6
Feaster III, Marshall M. *	76	⊙	⊙	⊙	⊙	6.0
Saint Joseph/Reading	74	⊙	⊙	⊙	⊙	6.0
Ferdinand, Francis D. *	127	⊙	⊙	⊙	⊙	6.4
Main Line/Lankenau	125	⊙	⊙	⊙	⊙	6.5
Figueroa, Peter						
Temple/Lower Bucks	71	⊙	⊙	⊙	⊙	6.6
Fitzgibbon, Leo D.						
Saint Vincent	136	⊙	⊙	●	●	5.5
Fried, Robert T.						
York	87	⊙	⊙	⊙	⊙	5.4
Fulton, Jeffrey A.						
Main Line/Lankenau	36	●	●	⊙	⊙	7.4
Furukawa, Satoshi						
Temple University	95	⊙	⊙	⊙	⊙	7.3
Garcia, Jose P.						
Temple University	146	●	⊙	⊙	●	7.5
Gardner, Timothy J.						
Hosp of the Univ of PA	35	⊙	NR	NR	NR	6.0

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SURGEON DATA

Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Garzia, Fernando						
St Luke's/Bethlehem	148	⊙	⊙	⊙	⊙	4.8
George, Jacob						
Saint Vincent	49	⊙	⊙	⊙	⊙	5.7
Gilbert, Christian L.						
Geisinger/Danville	92	⊙	⊙	⊙	⊙	5.1
Goldman, Scott M.						
Main Line/Lankenau	97	⊙	⊙	⊙	⊙	6.2
Gordon, David A. *	76	⊙	⊙	⊙	⊙	5.9
Sacred Heart/Allentown	62	⊙	⊙	⊙	⊙	6.0
Gorman, Robert C. *	58	⊙	⊙	⊙	⊙	5.4
Hosp of the Univ of PA	49	⊙	⊙	⊙	⊙	5.5
Grant, Kathleen J.						
Washington	81	⊙	⊙	⊙	⊙	5.6
Griffith, Bartley P.						
UPMC Presbyterian	74	⊙	⊙	●	⊙	4.6
Grunewald, Karl E. *	153	⊙	⊙	⊙	⊙	5.6
Crozer-Chester	151	⊙	⊙	⊙	⊙	5.6
Guerraty, Albert J. *	214	⊙	⊙	⊙	⊙	5.4
Graduate	117	⊙	⊙	⊙	⊙	4.9
Hahnemann University	73	⊙	⊙	⊙	⊙	6.4
Hamzavi, Siamak *	80	⊙	⊙	⊙	⊙	7.1
Community/Scranton	51	⊙	⊙	⊙	⊙	7.2
Hargrove, III, W. Clark *	108	⊙	⊙	⊙	⊙	6.2
Presbyterian/Univ of PA	107	⊙	⊙	⊙	⊙	6.3
Harostock, Michael *	194	⊙	⊙	⊙	⊙	5.9
WVHCS-Hospital	192	⊙	⊙	⊙	⊙	5.8
Hart, James C.						
Pinnacle Health	124	⊙	●	⊙	⊙	5.5
Hattler, Brack G.						
UPMC Presbyterian	40	⊙	⊙	⊙	⊙	6.0
Haupt, Hans						
York	73	⊙	⊙	⊙	⊙	4.9

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Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Highbloom, Richard Y.	93	⊙	⊙	⊙	⊙	5.2
Frankford	51	⊙	⊙	⊙	⊙	5.0
Albert Einstein	42	⊙	●	⊙	⊙	5.6
Hoang, Vu T. *	80	⊙	⊙	⊙	⊙	4.8
Conemaugh Valley Memorial	79	⊙	⊙	⊙	⊙	4.8
Holland, Fred W. *	63	⊙	⊙	⊙	⊙	5.8
Western Pennsylvania	48	⊙	⊙	⊙	⊙	5.9
Howanitz, E. Paul						
Saint Joseph/Reading	113	⊙	⊙	⊙	⊙	6.2
Illes, Richard						
Williamsport	34	⊙	⊙	⊙	⊙	5.7
Jorge, Eduardo						
Pinnacle Health	77	⊙	⊙	⊙	⊙	6.5
Keagy, Gregory S.						
Pinnacle Health	98	⊙	⊙	⊙	⊙	5.9
Keeley, Samuel B.	96	⊙	⊙	⊙	⊙	4.8
Altoona	52	⊙	⊙	⊙	⊙	4.7
UPMC Lee Regional	44	⊙	⊙	●	⊙	5.0
Kokotos, William *	123	⊙	⊙	⊙	⊙	5.6
Saint Francis/Pittsburgh	114	⊙	⊙	⊙	⊙	5.5
Kolff, Jacob *	129	⊙	⊙	⊙	⊙	5.1
Conemaugh Valley Memorial	111	⊙	⊙	⊙	⊙	5.1
Kuretu, M.L. Ray *	99	⊙	⊙	⊙	⊙	6.2
Mercy/Fitzgerald	61	⊙	⊙	⊙	⊙	5.7
Leboutillier III, Martin						
Lehigh Valley	150	⊙	⊙	⊙	⊙	5.8
Lee, C. Chin						
Hamot	117	⊙	⊙	⊙	⊙	5.0
Lerberg, David	103	⊙	⊙	⊙	⊙	5.9
Western Pennsylvania	63	⊙	⊙	⊙	⊙	5.6
UPMC Shadyside	40	⊙	⊙	⊙	⊙	6.3
Levin, Bradley						
York	106	⊙	⊙	⊙	⊙	5.2

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SURGEON DATA

Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Lico, Serrie C.						
Geisinger/Danville	132	⊙	⊙	⊙	⊙	4.7
Liddicoat, John R. *	155	⊙	⊙	⊙	⊙	6.6
Allegheny General	143	⊙	⊙	⊙	⊙	6.8
Liebler, George A.						
Allegheny General	54	⊙	⊙	⊙	⊙	7.3
Lima, Claudio A. B.	182	○	⊙	⊙	⊙	6.6
UPMC Shadyside	139	⊙	⊙	○	○	6.9
Western Pennsylvania	43	⊙	⊙	⊙	⊙	5.8
Long, Richard W. *	176	⊙	⊙	⊙	⊙	5.2
Saint Vincent	174	⊙	⊙	⊙	⊙	5.2
Lough, Frederick C.						
Reading	127	●	⊙	⊙	⊙	6.3
Lundy, Edward F.	171	⊙	⊙	⊙	⊙	5.3
Lancaster General	129	⊙	⊙	⊙	⊙	5.2
Lancaster Regional	42	⊙	⊙	⊙	⊙	5.9
Machiraju, Venkat R. *	176	⊙	⊙	⊙	●	6.4
UPMC Shadyside	151	⊙	⊙	⊙	●	6.5
Magovern, James A. *	117	⊙	⊙	⊙	⊙	6.8
Allegheny General	107	⊙	⊙	⊙	⊙	7.0
Magovern, Jr., George J. *	70	⊙	⊙	⊙	⊙	6.6
Allegheny General	61	⊙	⊙	⊙	⊙	6.9
Maher, Thomas						
Saint Francis/Pittsburgh	50	⊙	⊙	⊙	⊙	6.0
Mannion, John D.						
Thomas Jefferson Univ	140	⊙	⊙	⊙	⊙	7.4
Marrone, Gary C. *	84	⊙	⊙	⊙	⊙	6.9
Allegheny General	80	⊙	⊙	⊙	●	6.9
Martella, Arthur T. *	107	●	●	⊙	⊙	6.4
Main Line/Bryn Mawr	106	●	●	⊙	⊙	6.4
Mathai, John						
York	145	⊙	⊙	⊙	⊙	5.1
McCarty, Christine M.						
Pinnacle Health	81	⊙	⊙	⊙	⊙	5.7

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SURGEON DATA

Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
McCaughan, James S.						
Robert Packer	83	⊙	⊙	⊙	⊙	5.3
McClurken, James B. *	161	⊙	⊙	⊙	⊙	6.0
Abington Memorial	144	⊙	⊙	⊙	⊙	6.0
McCurry, Kenneth R.						
UPMC Presbyterian	109	⊙	⊙	⊙	⊙	6.0
McGary, Suzan A.						
Williamsport	115	⊙	⊙	⊙	⊙	4.4
Mehta, Sanjay M.						
Milton S Hershey	43	⊙	⊙	⊙	⊙	5.3
Michalak, Dennis M.						
Hamot	139	⊙	⊙	⊙	⊙	4.9
Morris, Rohinton J. *	146	⊙	⊙	⊙	⊙	6.4
Presbyterian/Univ of PA	136	⊙	⊙	⊙	⊙	6.5
Navid, Forozan *	195	⊙	⊙	⊙	⊙	6.8
UPMC Shadyside	194	⊙	⊙	⊙	⊙	6.9
Nixon, Todd E. *	126	⊙	⊙	⊙	●	5.1
Medical College of PA	106	⊙	⊙	⊙	●	5.2
Nutting, Ron D.						
Reading	155	⊙	⊙	⊙	○	5.7
Osevala, Mark A.						
Pinnacle Health	60	⊙	⊙	⊙	⊙	6.1
Pae, Walter E.						
Milton S Hershey	79	⊙	⊙	⊙	⊙	5.0
Panebianco, Antonio C.						
Lehigh Valley	53	⊙	⊙	⊙	⊙	6.1
Park, Chong S. *	120	⊙	⊙	⊙	⊙	5.3
Saint Francis/Pittsburgh	103	⊙	⊙	⊙	⊙	5.2
Park, Kyung						
Saint Francis/Pittsburgh	134	⊙	⊙	⊙	⊙	5.6
Park, Sang B. *	99	⊙	⊙	⊙	⊙	6.0
Saint Francis/Pittsburgh	98	⊙	⊙	⊙	⊙	5.9
Pellegrini, Daniel P. *	159	⊙	⊙	●	●	6.7
Mercy/Pittsburgh	121	⊙	⊙	⊙	●	6.9

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Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Pellegrini, Ronald V. *	228	○	○	⊙	⊙	5.0
UPMC Presbyterian	216	⊙	○	⊙	⊙	5.0
Pennock, John L.						
Pinnacle Health	100	●	⊙	⊙	⊙	6.2
Pett, Stephen D. *	106	⊙	⊙	⊙	⊙	5.5
Saint Vincent	103	⊙	⊙	⊙	⊙	5.5
Phillips, Theodore G.						
Lehigh Valley	162	⊙	⊙	⊙	⊙	5.7
Pierce, Alice M. *	157	⊙	⊙	⊙	⊙	6.7
Mercy/Pittsburgh	126	⊙	⊙	⊙	⊙	6.9
Pochettino, Alberto	103	⊙	⊙	●	●	6.4
Presbyterian/Univ of PA	68	⊙	NR	NR	NR	6.4
Hosp of the Univ of PA	35	⊙	NR	NR	NR	6.5
Polidori, David J.	95	⊙	⊙	⊙	⊙	6.4
Lancaster General	59	⊙	⊙	⊙	⊙	5.8
Lancaster Regional	36	⊙	⊙	⊙	○	7.4
Priest, Brian P.	182	⊙	⊙	⊙	⊙	6.2
Main Line/Lankenau	105	⊙	⊙	⊙	⊙	6.2
Doylestown	77	⊙	⊙	⊙	⊙	6.2
Pym, John *	144	●	●	⊙	⊙	5.4
Frankford	140	●	●	⊙	⊙	5.4
Quigley, Robert L.	97	⊙	⊙	⊙	⊙	5.8
Albert Einstein	57	⊙	⊙	⊙	⊙	5.9
Frankford	40	⊙	⊙	⊙	⊙	5.7
Reitknecht, Felice L.						
Robert Packer	155	⊙	⊙	⊙	⊙	4.5
Rice, Philip L. *	80	⊙	⊙	⊙	●	4.9
UPMC Lee Regional	65	⊙	⊙	⊙	●	5.0
Sadr, Farrokh S.	106	⊙	⊙	⊙	⊙	5.4
Sacred Heart/Allentown	75	⊙	⊙	⊙	⊙	5.7
Lehigh Valley	31	⊙	NR	NR	NR	4.9
Samadani, Siroos						
UPMC Shadyside	34	⊙	⊙	NR	NR	7.3
Samuels, Louis						
Hahnemann University	94	⊙	⊙	⊙	⊙	7.3

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Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Sardesai, Prabhaker G.						
Hamot	31	⊙	NR	NR	NR	7.0
Seibel, P. Scott						
Medical Center/Beaver	156	⊙	⊙	⊙	⊙	6.0
Senan, Pushpendra *	38	⊙	⊙	⊙	⊙	6.1
Saint Francis/Pittsburgh	34	⊙	⊙	⊙	⊙	6.2
Shaffer, Carolyn W.						
Pinnacle Health	181	⊙	⊙	⊙	⊙	5.8
Shariff, Haji M.						
Saint Mary	131	⊙	⊙	⊙	⊙	7.1
Sinclair, Michael C.						
Lehigh Valley	182	⊙	⊙	⊙	⊙	5.7
Singer, Raymond L.						
Lehigh Valley	88	⊙	⊙	⊙	⊙	5.5
Sortino, Antonio						
Washington	127	⊙	⊙	⊙	⊙	5.5
Spotnitz, William D.						
Temple University	44	⊙	⊙	⊙	⊙	6.6
Stahl, Russell						
Community/Scranton	165	⊙	⊙	⊙	⊙	6.1
Stella, Joseph *	195	⊙	⊙	●	⊙	5.8
WVHCS-Hospital	192	⊙	⊙	●	⊙	5.8
Stept, Larry L. *	71	⊙	⊙	●	●	6.8
Western Pennsylvania	65	⊙	⊙	●	●	6.8
Strong, III, Michael D.						
Hahnemann University	194	⊙	⊙	⊙	⊙	7.2
Strzalka, Christopher T.						
Hamot	183	⊙	⊙	⊙	⊙	4.8
Sullivan, Lawrence X.	94	⊙	⊙	⊙	⊙	6.0
UPMC Shadyside	52	⊙	⊙	⊙	⊙	6.0
Western Pennsylvania	42	⊙	⊙	⊙	⊙	6.1
Sun, Benjamin C.						
Milton S Hershey	98	⊙	⊙	⊙	⊙	5.1

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Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Sutter, Francis P.	189	⊙	⊙	⊙	⊙	6.1
Main Line/Lankenau	151	⊙	⊙	○	○	6.4
Mercy/Fitzgerald	38	⊙	⊙	●	⊙	5.3
Suzuki, Mark Masaru						
Westmoreland Regional	163	⊙	⊙	⊙	⊙	5.3
Szydlowski, Gary W. *	93	⊙	⊙	⊙	⊙	6.9
Allegheny General	84	⊙	⊙	⊙	⊙	6.9
Tan, Wilfredo S.						
Hamot	93	⊙	⊙	⊙	⊙	5.8
Thakur, Navin S.	144	⊙	⊙	⊙	⊙	6.5
Western Pennsylvania	90	⊙	⊙	⊙	⊙	6.3
UPMC Shadyside	54	⊙	⊙	NR	NR	6.9
Theman, Terrill *	138	⊙	⊙	⊙	⊙	5.4
St Luke's/Bethlehem	126	⊙	⊙	⊙	⊙	5.5
Tomasello, Donald N. *	90	●	●	⊙	⊙	6.4
Main Line/Lankenau	89	●	●	⊙	⊙	6.4
Vasilakis, Alexander						
Medical Center/Beaver	158	⊙	⊙	⊙	⊙	6.2
Von Koch, Lear *	130	⊙	⊙	⊙	⊙	6.1
Mercy/Scranton	125	⊙	⊙	⊙	⊙	6.0
Watson, John W.						
Bon Secours Holy Family	37	⊙	⊙	⊙	⊙	6.0
Wei, Lawrence M. *	227	⊙	○	●	⊙	4.7
UPMC Presbyterian	222	⊙	⊙	●	⊙	4.7
Weinstein, Gerald						
Western Pennsylvania	57	⊙	●	⊙	⊙	4.9
Weiss, Steven J. *	119	⊙	⊙	⊙	⊙	5.8
Albert Einstein	103	⊙	⊙	⊙	⊙	5.9
Wilcox, Kenneth *	101	⊙	⊙	⊙	⊙	6.0
Mercy/Scranton	99	⊙	⊙	⊙	⊙	6.0
Wisman, Craig B.						
Pinnacle Health	95	⊙	⊙	⊙	⊙	6.0

* Had cases at other hospitals but too few to be reported here. That information can be found at www.phc4.org.

** Length of stay is the average number of days spent in the hospital following the CABG surgery, after accounting for patient risk.

○ Lower than expected
⊙ Same as expected
● Higher than expected
NR Not rated (too few cases)

SURGEON DATA

Surgeon/Hospital	Number of Cases	Mortality		Readmissions		Length of Stay **
		In-Hospital	30-Day	7-Day	30-Day	
Woelfel, G. Frederick	241	⊙	⊙	⊙	⊙	5.4
St. Clair Memorial	211	⊙	⊙	⊙	⊙	5.2
Mercy/Pittsburgh	30	⊙	NR	NR	NR	NR
Woods, Edward L.						
Geisinger/Danville	120	⊙	⊙	⊙	⊙	4.7
Woody, Daniel J. *	34	●	NR	NR	NR	7.0
Yeisley, Geary L.						
Lehigh Valley	200	⊙	⊙	⊙	○	5.8
Zadeh, Barry J.	192	⊙	⊙	⊙	⊙	5.7
Lancaster General	138	⊙	⊙	⊙	⊙	5.3
Lancaster Regional	54	⊙	⊙	⊙	⊙	6.9
Zama, Nche						
Robert Packer	137	⊙	⊙	⊙	⊙	4.9
Zenati, Marco						
UPMC Presbyterian	70	⊙	⊙	⊙	⊙	4.9

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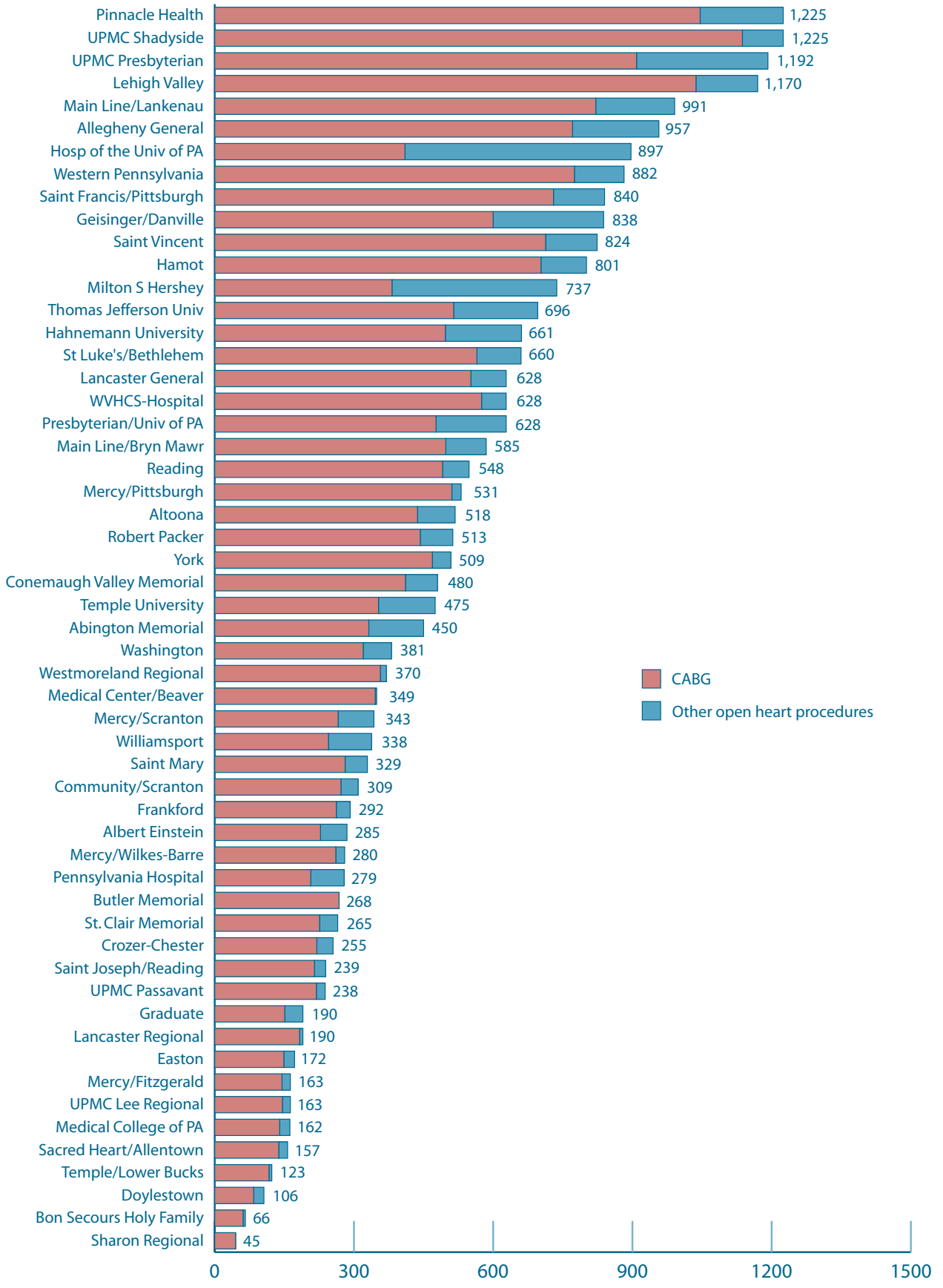
Total Number of Open Heart and CABG Procedures by Hospital - 2000

CABG surgery is the most commonly performed open heart surgery in Pennsylvania. The following graph shows how many open heart surgeries were performed in Pennsylvania hospitals in 2000 and the proportion of these procedures that involved CABG surgery.



Pennsylvania Health Care Cost Containment Council

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