Healthgrades has ranked The Valley Hospital #1 in New Jersey for Cardiac Surgery.

Healthgrades has ranked The Valley Hospital #1 in New Jersey for Cardiac Services.

Healthgrades has ranked The Valley Hospital #1 in New Jersey in Coronary Interventional Procedures.

Valley has earned Disease-Specific Care Certification – the Gold Seal of Approval – from The Joint Commission for the care of patients with heart failure.

Valley’s Intensive Care, Intermediate Care, Coronary Care, and Cardiac Surgery Intensive Care units have received the Beacon Award for Excellence from the American Association of Critical Care Nurses three consecutive times.

Valley has been named one of America’s 100 Best Hospitals for Cardiac Care, Cardiac Surgery and Coronary Intervention by Healthgrades.

Valley is a two-time recipient of the prestigious Magnet Award for Nursing Excellence from the American Nurses Credentialing Center.

For the ninth consecutive time, Valley received the J.D. Power and Associates Distinguished Hospital Award for Service Excellence.

The Society for Thoracic Surgeons (STS) has developed a comprehensive rating system for the quality of cardiac surgery among hospitals across the country. In the period covering July 2011 through June 2012, our cardiac surgery program’s performance was in the highest quality tier, receiving an STS 3-star rating.

Learn more about The Valley Hospital at www.valleyhealth.com
Dear Colleague,

The Valley Heart and Vascular Institute is pleased to share with you the sixth edition of our Outcomes Report. The Valley Heart and Vascular Institute is an integrated group of cardiologists, cardiac surgeons, and vascular surgeons focused on providing state-of-the-art care to our patients. In this report we include six consecutive years of cardiac surgery data. Our commitment to excellence has been recognized by The Society of Thoracic Surgeons, who gave us the highest rating - 3 stars - for our Coronary Surgery and Aortic Valve Surgery programs. These results position us in the top 14% and 5.9% respectively in the nation. In addition, we were recently recognized by Healthgrades as #1 in New Jersey in the areas of Cardiac Care, Cardiac Surgery, and Coronary Interventional Procedures. These outstanding recognitions are testament to the priority Valley places on achieving the highest quality outcomes while delivering the most compassionate care.

We thank you for your support and remain committed to providing you and your patients with the best possible outcomes.

Alex Zapolanski, M.D., F.A.C.C., F.A.C.S.
Director of Cardiac Surgery

The Valley Heart and Vascular Institute
Clinical Professor of Surgery
College of Physicians & Surgeons
Columbia University
The Society of Thoracic Surgeons (STS) has developed a database that collects surgical demographics and results. It also uses a methodology to adjust for case complexity. These statistical techniques, while not perfect, attempt to compensate for the difficulty of assessing the risk of different groups of patients. We use these national standards to evaluate our results.

Our patients are entered into the STS database, which is provided to Duke University Clinical Research Institute to generate a national comparison report. Based on past surgical experience, patients with a specific pathological process have an expected result from a heart operation. The observed result from any type of surgery can then be compared to the expected result. A ratio is calculated. Anything equal to 1 is satisfactory. A ratio less than 1 exceeds expectations.

\[
\text{Observed mortality} = 1.5 \\
\text{Expected mortality} = 2.0 \\
\text{Observed to Expected (O/E ratio)} = 0.75 \\
\text{or better than expected.}
\]

Improvements in surgical techniques and technological advances have contributed to enhanced results even with increased patient complexity. Morbidity and mortality continue to decrease, creating new standards to strive for.

We encourage you to review the material and keep it handy for reference.

Comparative data has been obtained from the 2011 Harvest of The Society of Thoracic Surgeons.
The Valley Hospital’s cardiac surgery program performed 3,020 procedures over a six-year period (January 2006 to December 2011). Decision making in the management of cardiac disease is in constant evolution. There is still some controversy regarding therapy for subsets of patients where different approaches seem equivalent. Referrals for surgical management are changing due to the effectiveness of medical management and percutaneous interventions. Yet, after several years of reduction in referrals for coronary bypass surgery, the numbers nationwide seem to have stabilized. On the contrary, patients with mitral regurgitation and aortic stenosis that are asymptomatic are being considered for surgical correction prior to ventricular deterioration.

The Valley Heart and Vascular Institute performs a higher percentage of valvular and other complex procedures than The Society of Thoracic Surgeons’ average. We reviewed our results for six years and our overall mortality was 1.8 percent. This includes all elective, urgent, and emergent operations. No patient was excluded. The following pages provide a detailed analysis of the different types of procedures.
For six years, The Valley Heart and Vascular Institute delivered consistently fewer complications and lower mortality than the national average.

MORTALITY RELATED TO AGE

These numbers reflect patients operated on in 2011. The Valley Heart and Vascular Institute treats a large number of patients of advanced age. In 2011, the number of patients over the age of 80 was 21 percent of the total surgical population. As risk increases with age, modern techniques allow us to offer complex procedures to this patient population.
The Valley Heart and Vascular Institute has a dedicated team of board-certified surgeons, nurse practitioners and physician assistants who possess extensive knowledge and the advanced skills necessary to expertly care for the medical and psychosocial needs of our cardiothoracic surgery patients.

This team manages patients before and after surgery. Together, we promote a positive healing environment for patients and their families.

This comprehensive approach blends intellect and compassion, resulting in the highest quality of care and patient satisfaction.

From left to right:
Alex Zapolanski, M.D., F.A.C.C., F.A.C.S.
Mariano Brizzio, M.D.
Juan Grau, M.D., F.A.C.C., F.A.C.S.
Jason Sperling, M.D., F.A.C.S.

From left to right:
Andrea Storper, ANP-BC; Mary C. Collins, ACNP-BC; Linda Romeo, ANP-BC; Elaine Tormey, ACNP-BC; and Kimberly Pryslak, ACNP-BC. Missing from the picture are Carrole Dorcent, ACNP-BC, Dee Dubose, ACNP-BC, Jeanne Howe, FNP-BC, and Denise Goldstein, ACNP-BC.
GLUCOSE CONTROL IN CARDIAC SURGERY PATIENTS

Intra-operative and post-operative control of blood sugar has been shown to improve results. As the chart reflects, The Valley Heart and Vascular Institute team’s strict adherence to protocols helps to achieve excellent results.

The incidence of deep sternal wound infections has consistently been below the STS national average. Glucose control has contributed to the avoidance of this complication. In addition, the limited number of surgeons involved in patient care reduces risk. In 2011, the sternal wound infection rate was 0 percent.

STERNAL WOUND INFECTIONS

This chart reflects the results for 2011.
The coronary bypass operation was developed more than 45 years ago. Over the past decade the national mortality has decreased. We believe that evaluating the results of coronary surgery using the single end point of mortality is not sufficient. In addition to achieving a better-than-expected operative mortality, we have focused on a number of other elements to assess the quality of our coronary bypass operations.

The following data reflect:
- utilization of off-pump techniques,
- extensive revascularizations,
- higher utilization of arterial grafts, and
- less blood utilization.

OFF-PUMP SURGERY ACTIVITY

Since the inception of the OPCAB (Off-Pump Coronary Artery Bypass) technique, The Valley Heart and Vascular Institute surgeons have performed more than 4,000 procedures without cardiopulmonary bypass. Our data, as well as data in many publications, reflect the benefit of this technique in selected patients, particularly those at high risk of predicted mortality. Off-pump techniques benefit both men and women and narrow the disparity in mortality after coronary bypass grafting.*

Research performed at The Valley Heart and Vascular Institute shows that off-pump surgery helps reduce mortality due to stroke.**

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It should be noted that in the context of improvements in medical, pharmacological, and percutaneous interventional management of patients with coronary disease, a greater percentage of patients referred to surgery have Left Main Trunk Stenosis. We have a higher percentage of patients with left main and triple vessel disease than the national average.

Coronary bypass surgery results in octogenarians at The Heart and Vascular Institute have been almost identical to the younger cohort. Of the 193 patients who underwent surgery at Valley, mortality was 1.08% (2 patients).

Left Main Mortality
There were 620 operations performed in six years on patients with Left Main Disease. The overall mortality rate for this complex subset of patients was 0.8 percent (includes urgent and emergent cases). This number is below the mortality rate of the Syntax trial and sets a standard for the management of patients with this type of anatomical lesion. The majority of these patients were operated on without cardiopulmonary bypass.

Higher occurrence of Left Main Trunk Stenosis reflects increase in severity and risk.
RESULTS AND QUALITY MEASURES

**Observed-to-Expected Mortality Ratio**

Isolated CABG (Coronary Artery Bypass Grafts) refers to patients undergoing coronary bypass without any other procedures. The Valley Heart and Vascular Institute surgeons performed 1,316 isolated CABGs in the past six years with a combined mortality of 0.7 percent (2006 to 2011).

According to the STS, expected mortality for The Valley Heart and Vascular Institute coronary patients in 2011 was 1.8 percent. Adjusted mortality was 0 percent. Mortality and morbidity has been consistently below the STS average.
RE-OPERATIVE MORTALITY FOR CORONARY SURGERY

Re-operative coronary surgery carries a higher mortality than primary procedures. For six consecutive years, mortality at Valley has been zero.

![Risk Adjusted Re-operative Surgical Mortality](image)

COMPLETENESS OF REVASCULARIZATION (number of grafts per patient)

The cardiac surgery team at The Valley Heart and Vascular Institute performs more grafts per patient than other hospitals. Off-pump techniques do not compromise the extensiveness and complexity of the operation. Complete revascularization improves long-term results.

![Completeness of Revascularization](image)
Arterial grafts improve long-term results by reducing risk of re-operation and reducing risk of cardiac events. The STS considers the use of the internal mammary artery (IMA) as a quality indicator. The Heart and Vascular Institute uses both single and bilateral IMAs more frequently than the national average. When the left anterior descending coronary artery required grafting, the IMA was used in 100 percent of patients.

Our team has extensive experience in complex arterial reconstruction of the coronary tree. In the past 17 years, 1,700 patients underwent surgery using bilateral internal mammary arteries.

The value of bilateral internal mammary utilization is well documented. Our team has published the results of our findings in *European Journal of Cardio-Thoracic Surgery* 41 (2012) 770-776.
BLOOD UTILIZATION

The Valley Heart and Vascular Institute’s surgical team is continually striving to minimize the use of blood during coronary artery bypass surgery. The following results reflect improvements over the past six years. In 2011, 68 percent of patients had no transfusions at all. We have been carefully assessing patients that received Plavix® or Effient® prior to cardiac catheterization. The ability to assess the patient’s clotting performance has helped us reduce the need for blood and blood products. In addition, the use of off-pump techniques for the majority of patients receiving coronary bypass surgery at The Valley Heart and Vascular Institute reduces hemodilution, as well as blood loss.

The data shows that in 2011, The Valley Heart and Vascular Institute patients were almost half as likely to receive blood than the national average.
The use of off-pump techniques reduces time on the ventilator and in the intensive care unit. Fewer complications result in shorter hospital stays. At The Valley Heart and Vascular Institute, patients go home sooner than the STS and LG averages. Rarely do patients require prolonged hospitalization.

**Post-operative Stays after Coronary Bypass Surgery**

<table>
<thead>
<tr>
<th>Total Time on a Ventilator (in hours)</th>
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<tbody>
<tr>
<td>VHVI</td>
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<tr>
<th>Prolonged Ventilation</th>
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<tr>
<td>VHVI</td>
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<tr>
<th>Post-operative Mean Length of Stay (in days)</th>
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<tr>
<td>VHVI</td>
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<tr>
<th>Post-operative Stays of Less Than 6 Days (% of patients)</th>
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<td>VHVI</td>
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<th>Post-operative Stays of More Than 14 Days (% of patients)</th>
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<tr>
<td>VHVI</td>
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</table>

Srinivasa Edara, M.D.  
Director, Cardiac Surgery Intensive Care Unit. Dr. Edara is directly involved in the medical management of all cardiac surgery patients and assists families while their loved one is in the hospital.
**ENDOSCOPIC VEIN HARVESTING**

Endoscopic vein harvesting has become the standard of care. Patients operated on at The Valley Heart and Vascular Institute benefit routinely from this technique. Endoscopic harvesting improves cosmesis, reduces pain, and has virtually eliminated the risk of infections in the lower extremities.

![Percentage of Veins Harvested Endoscopically](image)

**CENTER FOR HEART VALVE DISEASE**

Valvular surgery continues to represent a significant percentage of The Valley Heart and Vascular Institute’s total volume of surgery. Over the last six years, 1,283 valve procedures were performed at The Valley Heart and Vascular Institute. This represents 42% of our patients.

![Pie Chart](image)

An integral part of The Valley Heart and Vascular Institute team, Physician Assistants are advanced practice clinicians licensed to practice medicine with the supervision of a licensed physician. Valley’s Physician Assistant team includes, from left, Susan Fried, P.A. and Beth Bosticco, P.A.. Not shown: Anand Dave, P.A.; Richard Murphy, P.A., Gaby Salib, P.A., Joseph Stinelli, P.A., and Maria Tenebruso, P.A.
AORTIC VALVE SURGERY

As the population continues to age, surgery of the aortic valve has become more prevalent. From January 2006 – December 2011, surgeons at The Valley Heart and Vascular Institute performed aortic valve replacements and repairs in 938 patients. This included patients with isolated aortic valve disease, aortic valve and coronary pathology, multiple valve replacements and aortic valve surgery in association with surgery of the ascending aorta.

Our team’s approach to aortic valve surgery helps explain the difference in results and our 3-star rating from the STS. Despite a significantly older population among our patients, shorter procedures, fewer transfusions, and less time in intensive care has led to a lower mortality rate.

<table>
<thead>
<tr>
<th>Isolated AVR 2011</th>
<th>VHVI</th>
<th>LG</th>
<th>STS</th>
</tr>
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<tbody>
<tr>
<td>Patients Age Greater Than 65 (%)</td>
<td>87</td>
<td>70</td>
<td>68</td>
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<tr>
<td>Time in OR (min)</td>
<td>241</td>
<td>284</td>
<td>298</td>
</tr>
<tr>
<td>Pump Time (min)</td>
<td>89.2</td>
<td>100.4</td>
<td>106.1</td>
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<tr>
<td>Patients Transfused (%)</td>
<td>42.9</td>
<td>59.1</td>
<td>62</td>
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<tr>
<td>Total Ventilation Times (hours)</td>
<td>8.8</td>
<td>25.6</td>
<td>23.8</td>
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<td>ICU Stays (hours)</td>
<td>42.7</td>
<td>76.7</td>
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<td>Length of Stay (days)</td>
<td>5.6</td>
<td>7.9</td>
<td>7.8</td>
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<table>
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<tr>
<th>AVR &amp; Coronary Bypass 2011</th>
<th>VHVI</th>
<th>LG</th>
<th>STS</th>
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<tr>
<td>Patients Age Greater Than 65 (%)</td>
<td>93</td>
<td>83.9</td>
<td>82.8</td>
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<tr>
<td>Time in OR (min)</td>
<td>300</td>
<td>350</td>
<td>369</td>
</tr>
<tr>
<td>Pump Time (min)</td>
<td>128</td>
<td>138</td>
<td>147</td>
</tr>
<tr>
<td>Patients Transfused (%)</td>
<td>70</td>
<td>77</td>
<td>79</td>
</tr>
<tr>
<td>Total Ventilation Times (hours)</td>
<td>25.2</td>
<td>34.9</td>
<td>34.5</td>
</tr>
<tr>
<td>ICU Stays (hours)</td>
<td>57</td>
<td>94</td>
<td>98</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>7.5</td>
<td>9.2</td>
<td>9.1</td>
</tr>
</tbody>
</table>
Since 1993, 972 mitral valves have been repaired at The Valley Heart and Vascular Institute. The great majority of patients with myxomatous and ischemic disease receive a valve repair. Mitral valve repair provides patients with better outcomes in degenerative and ischemic disease. In the period between January 2006 and December 2011, we performed 208 mitral valve repairs in three categories—isolated mitral valves, mitral valve with coronary bypass, and multiple valve procedures.

Mortality at Valley has been zero percent for six years.
MINIMALLY INVASIVE APPROACHES

Surgery of the aortic and mitral valve can be performed through small incisions. Valley surgeons have been performing less invasive valve surgeries since the procedures were developed in the mid-nineties. While not all patients are candidates for minimally invasive techniques, surgeons carefully evaluate patients to determine the best technique for each individual.

To see a film showing a mini mitral repair, visit www.valleyheartandvascular.com. Click on Cardiac Surgery, then click Procedures/Techniques, then The Center for Heart Valve Disease.

Limited Access Approach Gets Torsoe Back to Business

Coronary artery bypass is generally performed by dividing the sternum (breast bone), which requires a large incision. However, some patients are candidates to have the surgery performed through a “limited access” (less invasive) approach. One such patient was Ken Torsoe.

Ken, a local businessman, needed a quadruple bypass. He sought opinions from leading institutions in the country and selected The Valley Hospital for his surgery. Ken’s surgeon, Alex Zapolanski, M.D., Director of Cardiac Surgery, performed the operation through a small (3 inch) mini-thoracotomy.

“The recovery period from this less invasive approach allows patients to more quickly resume their active lifestyles”, says Dr. Zapolanski. “This was important for Mr. Torsoe, who wanted to get back to his busy life.”
Risk Assessment

Our risk assessment approach begins by identifying elements that are sometimes obvious but other times “hidden” in the medical history that could affect risk stratification in the current American Heart Association (AHA)/American College of Cardiology (ACC) guidelines. Physical examination sometimes can reveal important findings that are also known to increase risk, and warrant surgical intervention at smaller sizes. The most glaring example is the Marfan syndrome, a connective tissue disorder that is diagnosed using an internationally ratified scoring system. This is followed by highly quantitative analysis of the aneurysm burden using specialty imaging studies that are unique to Valley Hospital. Specifically, we use a technique called retrospective gating that allows us to “freeze” images of the aorta and aortic valve throughout multiple phases of the cardiac cycle. This eliminates blurring that is caused by the natural movement of the aorta due to the heart’s pumping action, delivering the most crisp and accurate images. These images are then processed using special software that re-builds the aorta in 3 dimensions so that together with our radiologists we can make aortic measurements with a much higher degree of certainty than other non-specialized centers. One benefit of more accurate imaging is that we are able to identify an aortic valve abnormality that is a “game-changer” when it comes to aneurysm risk, called bicuspid aortic valve (BAV). Subtle forms of BAV are the most common, and can be missed with routine echocardiography. The reason this is so important is because the AHA/ACC guidelines recommend surgery for BAV-associated aneurysms at a size of 5 cm as opposed to the “standard” 5.5 cm, and sometimes even at sizes smaller than 5 cm depending on the patient’s height.

A very important aspect of our technique is that we are able to identify an aortic valve abnormality that is a “game-changer” when it comes to aneurysm risk, called bicuspid aortic valve (BAV). Subtle forms of BAV are the most common, and can be missed with routine echocardiography. The reason this is so important is because the AHA/ACC guidelines recommend surgery for BAV-associated aneurysms at a size of 5 cm as opposed to the “standard” 5.5 cm, and sometimes even at sizes smaller than 5 cm depending on the patient’s height.

Below, our specialty imaging technique that shows a BAV (right) where it looked like a tri-leaflet valve on echo as well as routine imaging (left).
Medical Management
At Valley, medical management begins with advice to physicians and patients regarding additional testing, blood pressure management, as well as whether or not family members require screening as well. We become the gatekeepers for this specific medical problem, and dictate the timing and type of follow-up imaging that is required. By far, the most important aspect of medical management is providing counseling to patients and families regarding which physical activities must be avoided, regardless of the size of the aneurysm or dilated aorta. Our techniques seem to be effective: we have never had an aneurysm complication in any patient in our surveillance program. On the other hand, patients also learn that certain activities that they thought were prohibited are actually permissible. The TABAV (Thoracic Aneurysm and Bicuspid Aortic Valve) program regularly holds support groups at the Valley Hospital. These efforts are directed at positively impacting the quality of life of patients with thoracic aneurysm and/or BAV, which is an area of research in our program.

HIGHLY SPECIALIZED SURGERY
At Valley, we perform more elective aneurysm surgery than many university cardiac programs in the U.S. The operations we perform comprise both the simplest and the most complex. We utilize stents to treat aneurysms of the aortic arch and descending thoracic aorta, which has dramatically increased the safety and minimized the morbidity of these procedures. Along with our partners in Vascular Surgery, endovascular stent grafting of the aorta has been performed for thoracic and abdominal aortic aneurysms in more than 300 patients. When aneurysms of the aortic arch cannot be treated with stenting, we use a technique of brain-protection during surgery that has been associated with the best neurologic outcomes, proven time and again in the surgical literature. Our permanent stroke rate since the inception of the TABAV program is striking at zero, and this is an operation that has been classically associated with higher stroke rates at other institutions. Perhaps one of the most important surgical aspects of our program is a special technique for treatment of aortic root aneurysms, called “valve-sparing” surgery, also known as the David procedure.

David procedure (valve-sparing aortic root replacement): patient’s aortic valve repaired and re-implanted into a polyester tube. Most surgeons would replace the valve.

The aortic root is the portion of the aorta that immediately exits the heart, and is literally attached to the aortic valve, left ventricle and coronary artery origins. What most patients don’t realize is that in the vast majority of aortic root replacements in the U.S., the aortic valve is removed and replaced even if the valve is functioning normally or can be repaired. This is because few centers in the U.S. have mastered the technique of valve-sparing aortic root replacement (VSSR or the David procedure). The TABAV program is one of the very few in the New York city area that has performed a substantial number of these procedures, and our patients have experienced extremely safe outcomes. In addition, most patients would be surprised to learn that even severely leaking aortic valves (including BAVs) can be repaired as part of these procedures, and that these repairs will likely be durable for the rest of the patients’ lives. This is a significant advantage over valve replacement, which will either require life-long blood thinners (mechanical valves) or require re-replacement in the future (pig or cow valves). This surgical expertise has led us to pursue aortic valve repair (as opposed to replacement) for leaking aortic valves, even in cases where aneurysm is not present. This too, is a specialized type of surgery that is available at only a few centers in the U.S.
TABAV RESEARCH: IDENTIFYING THE HIDDEN RISK IN SMALLER ANEURYSMS

Though aortic size (usually > 5.5 cm) is the current guidelines-based trigger for aneurysm surgery, experts understand that this system is flawed. In fact, published data from the International Registry of Acute Aortic Dissection (IRAD) shows that 60 percent of aortic dissections (the most common form of aortic rupture) occur at sizes < 5.5 cm, and that a full 40 percent occur at sizes < 5 cm. At the 2012 AATS Aortic Symposium, Dr. Sperling and his partners had a presentation showing data from Valley Hospital where women experienced aortic dissection at smaller sizes than men. In fact, 50 percent did so at sizes less than or equal to 4.5 cm, and this finding correlated strongly with smaller stature (height). The answer is not simply operating on every aneurysm: the great majority pose no significant risk at all. We believe that the trick is to find a way to identify the minority of these smaller aneurysms that have the “ability” to rupture at all (most don’t). Large aneurysms are stiff and cannot stretch in response to a significant increase in blood pressure (they rupture instead). Normal aortas and nearly all small and moderate sized aneurysms are quite elastic, and can expand accordingly in response to even dramatic increases in blood pressure. We have developed special image acquisition and analysis that allows us to generate a “stiffness score” for aneurysms.

“We have developed a bench-model of aortic dissection wherein strips are cut from actual aneurysms that have been removed at the time of surgery.”

The second aspect of our research attempts to understand what these stiffness scores physically mean. We have developed a bench-model of aortic dissection wherein strips are cut from actual aneurysms that have been removed at the time of surgery. The tissue is tested using sophisticated software that can generate engineering measures of each specimen’s stiffness. Ultimately, we will be able to see if our specialty CT scan is able to prospectively predict aortic stiffness as determined by direct aortic testing. The end result may be landmark scientific work that could change the AHA/ACC guidelines.
**TABAV Registry**

At Valley, there are approximately 600 patients in the TABAV registry. New patients are added at a rate of approximately 3 per week. Though most patients come from Bergen County, some come from as far south as the Jersey shore, as far west as Pennsylvania, and from Rockland and Orange counties in NY. The purpose of the registry is to minimize or eliminate the devastating consequences of aortic dissection and rupture through education and intervention only when necessary.

*For more information, please call 201-447-8418.*

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**Examples of specialty imaging used to provide ultra-accurate aneurysm dimensions and to perform stiffness assessment.**

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**AORTIC DISSECTION**

Dissection of the aorta is one of the most catastrophic cardiovascular events, and is by far the most common deadly aneurysm complication. When aortic dissection involves the ascending aorta and emergency surgery is required, rapid and accurate diagnosis is imperative as delay leads to poor outcomes.

Emergency Department physicians at Valley have a high level of accuracy at recognizing this entity. The presence of Computed Tomography (CT) equipment in the Emergency Department accelerates the diagnosis and improves surgical results.

The surgeons at The Valley Heart and Vascular Institute have performed 30 emergency ascending aortic dissections over the past five years, with a mortality rate of 6.6 percent. These results compare favorably to the published Registry of Acute Aortic Dissections (IRAD) mortality rate of 25 percent.

*Aortic flap showing a dissection.*
Constance “Candie” Frank’s had an aneurysm that did not require an intervention. At 4.8 centimeters in size, it was well below the 5.5 centimeter size that the American Heart Association, American College of Cardiology, and STS would consider the threshold for surgery, according to current guidelines.

Luckily for Candie, her cardiac specialists at The Valley Hospital Heart & Vascular Institute had the expertise and state-of-the-art technology to determine that the aneurysm was not one that should wait. A common birth abnormality, called bicuspid aortic valve (BAV), was detected during her specialized workup at the Institute’s TABAV program. Combined with the aneurysm, this put Candie, 54, at higher risk for an aneurysm-related catastrophe. So much so, that with the new diagnosis of BAV, she met a criterion in the current AHA/ACC guidelines for surgical intervention related to her shorter stature (height). Candie and her relatives (BAV is hereditary) will continue to be monitored throughout her lifetime.

At The Valley Heart & Vascular Institute, Candie underwent a series of diagnostic tests through the TABAV program. This comprehensive program combines sophisticated diagnostic evaluation, surveillance, and both surgical and non-surgical management of thoracic aneurysms. The ultimate goal: to prevent deadly aortic dissections (tearing) and aortic ruptures.

“With Mrs. Frank, imaging tests that are unique to our program in this region revealed a BAV, which may never have given her trouble, but when combined with a thoracic aortic aneurysm put her at higher risk than usual for a serious aneurysm-related event. It would be easy for any physician to miss Mrs. Frank’s BAV because they can be tricky to diagnose on an echocardiogram,” explains Dr. Sperling. “But with our unique imaging package, developed with Dr. Edward Lubat and his partners in Valley’s Department of Diagnostic Imaging, we were able to diagnose this “occult” BAV, which upgraded her risk. It is my impression that BAV is present in the setting of aneurysm more commonly than we think it is.”

After discussing her options at length, Candie chose to have elective surgery to remove the aneurysm. Her aortic valve was confirmed to be bicuspid, and it was healthy and functioning well and therefore did not require repair or replacement. Data from the Mayo Clinic shows that 60 to 70 percent of well-functioning BAVs continue to perform well throughout patients’ lifetimes.

To protect Candie’s brain during this surgery which involved her aortic arch, Dr. Sperling used a technique that has been shown to be associated with the best neurologic outcomes. “Using a neuro-protective protocol when indicated, we have completed approximately 200 consecutive aortic surgeries with no permanent strokes, and in addition, achieved a 99 percent survival rate for elective aortic surgery over the past 5 years.”

Candie did extremely well, and is back to enjoying life. She will continue to be followed in the TABAV “family” indefinitely.

Candie Frank pictured with Dr. Jason Sperling, Subspecialty Director of the TABAV Program
SURGERY FOR ATRIAL FIBRILLATION

Atrial fibrillation is a prevalent condition in the U.S. that increases with aging. Atrial fibrillation is associated with shorter life spans, a lifelong increased risk of adverse cardiac events including stroke and an overall significantly decreased quality of life. Depending on individual risk, Coumadin® may be indicated for stroke prevention, albeit with a 1 percent annual risk of a clinically significant bleeding event.

Treatment of atrial fibrillation ranges from catheter ablation in the Electrophysiology Lab to open heart procedures that can treat the most difficult patient subsets. Surgeons at Valley Hospital are proficient in performing extensive bi-atrial Maze surgery (Cox-Maze III), as well as less invasive iterations of the procedure. We have access to the most up-to-date technologies for destroying or trapping atrial fibrillation signals, including radiofrequency, cryothermy, and high-intensity focused ultrasound.

Over the next year, we hope to offer patients the opportunity to enroll in a prospective database specifically geared toward patients who have advanced forms of atrial fibrillation and are usually not offered an intervention. By objectively tracking our outcomes utilizing implantable loop recorders, we will find the patient subsets that will benefit from aggressive treatment of their condition. Coumadin® reduces but does not eliminate stroke risk in atrial fibrillation. Almost every patient undergoing heart surgery at Valley (and every patient undergoing an atrial fibrillation procedure) has a structure called the left atrial appendage excluded from the heart. About 80-90 percent of clot formations occur in the left atrial appendage. Therefore, we believe that patients are better protected when that appendage is eliminated.

CARDIOVASCULAR ROBOTIC PROGRAM

Dr. Grau works with the Valley Hospital cardiovascular robotic program. Procedures include:
- Robotic coronary revascularization
- Mitral or tricuspid valve repair or replacement
- MAZE procedure for the treatment of atrial fibrillation
- Resection of atrial tumors
- Robotic ligation of the left atrial appendage for patients who cannot be placed on anticoagulation

Patients who underwent cardiovascular robotic surgery experienced fast recoveries and excellent cosmetics results. In addition, they were able to return to full physical activity few days after the procedure.

The robotic da Vinci Surgical System
IMPLICATIONS OF TRANSLATIONAL RESEARCH

To improve human health, scientific discoveries must be translated into practical applications. Such discoveries typically begin at “the bench” with basic research — in which scientists study disease at a molecular or cellular level — then progress to the clinical level, or the patient’s “bedside.” The scientific community is increasingly aware that this bench-to-bedside approach of translational research is really a two-way street. Basic scientists provide clinicians with new tools for use in patients and for assessment of their impact, and clinical researchers make novel observations about the nature and progression of disease that often stimulate basic investigations. The newly created Valley Translational Research Laboratory for Valvular and Aortic Diseases serves as a bridge between clinical and basic science research.

The innovative approach of our program is to combine multiple fields of knowledge from clinical data, imaging studies, and surgical research to the basic science laboratory, and to translate basic scientific insights into new tools for clinicians to be used in patients. We are coordinating a team of U.S. and international cardiovascular surgeons, cardiologists, radiologists, and scientists of different disciplines to create a unique, multidisciplinary team for the study of valvular and aortic wall diseases.

The Valley Biological Tissue Bank
At Valley, we have generated a bank of peripheral mononuclear cells, serum, plasma, and urine from patients with various cardiovascular diseases undergoing open cardiothoracic surgery. The development of a tissue bank is important as it allows for longitudinal studies of samples collected from patients at various stages of a given disease process. This permits the study of molecular changes during the progression of disease. Currently more than 700 tissue specimens are stored at The Valley Heart and Vascular Institute and are being used for intramural research and as collaborative efforts with other institutions.

The Valley Valve and Aortic Diseases Center
The creation of this Center provides patients with access to the interdisciplinary (cardiologists, cardiac surgeons, geneticists, etc.) care necessary for the management of their valve and/or aortic wall disease, all in one place. This patient-specific management provides customized care for each individual. We collect blood, tissue, and clinical data translating the laboratory work into clinical practice and applying new technologies to the treatment of valvular and aortic wall diseases.

Degenerative Aortic Valve Disease Program
Our research has characterized a novel biomarker profile for patients at early and late stages of aortic valve degeneration (aortic valve sclerosis). The use of this new profile in the clinical setting allows us to stage patients at different points of aortic valve degeneration. This, in time, will permit the development of new therapeutic strategies for the treatment of this condition.

Figure 1: Different stages of degeneration from a normal aortic valve to a sclerotic to a heavily calcified aortic valve.
**Bicuspid Aortic Valve**

BAV is a congenital cardiac abnormality predisposing to aortic stenosis that affects 2 percent of the world’s population. We and other investigators have learned that calcium deposition in BAV patients occurs in an accelerated manner when compared with normal valves. Current research efforts are ongoing to better understand this process and to prolong durability of these valves in this population of patients.

**Diseases of the Aortic Wall, Aortic Aneurysms, and Aortic Dissections**

Currently patients with aortic aneurysms are followed periodically and intervention is determined by the size of the aorta. We are conducting studies analyzing the modulation and differentiation of smooth muscle cell phenotypes in thoracic aortic aneurysms from bicuspid and trileaflet aortic valve patients. This will have significant implications in the treatment of these patients. Our goal is to help prevent aortic rupture and/or dissections in this subset of patients, as well as to develop new screening programs for patients affected by aortic pathologies.

**Gene Expression Profile and Protein Profile of Mitral Valve Prolapse**

Mitral valve prolapse (MVP) is the most common cardiac valvular abnormality in industrialized countries and the leading cause of mitral valve surgery for isolated mitral regurgitation (MR) affecting 2 to 8 percent of the world’s population.

Our work is focused on unveiling the different pathways involved in the continuous elongation of the prolapse leaflet, with the goal of helping identify patients with MVP who are at risk for mitral regurgitation.

**Who is eligible to participate in these programs?**

Subjects with or without current cardiovascular disease who wish to volunteer for these programs are welcome. Patients may be recruited from inpatient and outpatient services and/or physicians’ offices affiliated with Valley Health System.

**How to participate?**

Call 201-447-8453 and one of our research nurse coordinators will answer any questions you may have regarding the ongoing cardiovascular research programs at The Valley Heart and Vascular Institute.
The rare situation in which the heart’s pumping ability has become so acutely compromised that it cannot sustain normal body functions is called cardiogenic shock. This can occur as a consequence of heart attack, valvular failure, viral infection, and rarely, after open heart surgery.

Valley Hospital is well-equipped to handle such a dire situation. When medicines or other support strategies fail, we have a range of ventricular assist devices (VADs) that can take over some or all of the pumping capacity of the heart. One device, called Impella®, is placed percutaneously through the groin using fluoroscopic and Transesophageal Echocardiography (TEE) guidance. This device is only 5 mm in diameter yet can generate 2.5 liters/minute of blood flow (approximately 50 percent of the normal cardiac output). Impella® is also used pre-emptively in the catheterization lab for high-risk stenting procedures.

We also have used Abiomed Ventricles, which are capable of supporting either or both the right and left ventricle with full flow capabilities in excess of 5 liters/minute. Such mechanical support has been used to allow the patient’s own heart muscle to recover, or as a bridge to heart transplantation when necessary.

The Impella® 2.5 is a minimally invasive, catheter-based cardiac assist device.

**SURGERY FOR HEART FAILURE**

Heart failure is one of the most prevalent conditions in clinical medicine. Five million people in the U.S. have heart failure, and it is estimated that 68 percent of these patients suffer from coronary disease. Yet, only 11 percent of all patients with ischemic cardiomyopathy undergo cardiac catheterization. In turn, only a fraction of heart failure patients can be treated with the many tools available today. Two thirds of patients with heart failure due to ischemic cardiomyopathy have recoverable myocardium and could be helped by surgery or percutaneous intervention.

At Valley, MRI technology with special software – Cardiom-Compass™ – allows us to identify patients that could benefit from available therapies.
Valley’s Heart Failure multidisciplinary program incorporates the expertise of physicians, surgeons, nurse practitioners, nurses, pharmacists, dietitians, cardiac rehabilitation professionals, case management specialists, respiratory therapists, and home care staff. The program offers patient education and professional consultation.

The program has been integrated with the hospital’s cardiac surgery, interventional cardiology, electrophysiology, diagnostic imaging, and home care services to ensure heart failure patients access to existing evidence-based evaluations and treatments.

Technologies and procedures offered through Valley’s Heart Failure program include:

- cardiac MRI with Cardiom-Compass capability,
- ultrafiltration,
- defibrillators and resynchronization,
- ventricular remodeling surgery, and
- left ventricular assist devices.

We have also developed strategies to improve surgical outcomes in patients with severely diminished left ventricular function (low-ejection fraction patients). The philosophy is based on minimizing or eliminating the duration of downtime of the heart muscle during heart surgery.

MRI of the heart.
One in three women die of heart disease but women are twice as likely to die after a heart attack than their male counterparts, and have poorer outcomes than men with all standard therapies. The Center for Women’s Heart Health was established at The Valley Hospital to address the need to educate women of these facts. Partnering with local groups and corporations, lectures are offered throughout Valley’s service area to educate women and to promote the work of the Center. Cardiovascular screenings are offered including medical history and a focused physical exam, identifying individual risk factors. Providing this vital service, free of charge, affords all women access.

Since its inception, the Center has screened 2,000 women and educated more than 5,000.

The Center was recognized in 2010 by the Preventive Cardiovascular Nurses Association (an international organization that promotes the prevention of heart disease) winning second place for their abstract and poster presentation at their annual conference. The abstract was published in The Journal of Cardiovascular Nursing.

The New Jersey Hospital Association awarded the Center for Women’s Heart Health the NJBIZ Healthcare Heroes Award for Community Outreach for 2011. The award recognizes unique and effective methods of reaching out to better serve the healthcare needs of the community.

With the success of the Center for Women’s Heart Health, Valley now offers The Men’s Heart Center, which is committed to raising awareness of heart disease in men.

For more information about the Men’s Heart Center, please call 201-447-8207.
For more information about the Center for Women’s Heart Health, please call 201-447-8125.

“Cardiovascular screenings are offered including medical history and a focused physical exam, identifying individual risk factors. Providing this vital service, free of charge, affords all patients access.”
INTERVENTIONAL CARDIOLOGY

A wide variety of treatment options are available from Valley’s comprehensive interventional cardiology program. Intervventional procedures are those in which catheters or other devices are inserted through blood vessels to diagnose and treat heart disease. Using the most sophisticated technology available, from imaging equipment to implantable devices such as drug-eluting stents, patients who come to Valley are offered state-of-the-art cardiac care in our full-service Catheterization Laboratory. Among the many treatment options available are interventions for coronary artery disease, congenital abnormalities, heart failure, valvular heart disease, as well as carotid and peripheral disease.

For a referral to a Valley Hospital Interventional Cardiologist, call 201-447-8456 or visit www.valleyheartandvascular.com.

INTERVENTIONAL CARDIOLOGY QUALITY MEASURES

- Valley Heart & Vascular Institute
- CathPCI registry™; all hospitals

<table>
<thead>
<tr>
<th>Metric</th>
<th>Valley Heart &amp; Vascular Institute</th>
<th>CathPCI registry™; all hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE or ARB among patients with an EF&lt;40%</td>
<td>85.1%</td>
<td>79.9%</td>
</tr>
<tr>
<td>Aspirin</td>
<td>99.7%</td>
<td>97.9%</td>
</tr>
<tr>
<td>Beta blockers</td>
<td>86.9%</td>
<td>86.3%</td>
</tr>
<tr>
<td>Lipid-lowering agents</td>
<td>94.1%</td>
<td>92.5%</td>
</tr>
<tr>
<td>Proportion of STEMI patients receiving immediate PCI within 90 minutes</td>
<td>92.8%</td>
<td>90.9%</td>
</tr>
<tr>
<td>Statins prescribed at discharge</td>
<td>93.9%</td>
<td>91.3%</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Thienopyridine in patients with stents</td>
<td>98%</td>
<td>97.3%</td>
</tr>
</tbody>
</table>

87.6% of patients who have had PCI at Valley are referred for Cardiac Rehabilitation versus a registry aggregate of 60%.
The Valley Hospital reports data quarterly to the National Cardiovascular Data Registry’s CathPCI Registry™ published by the American College of Cardiology Foundation (ACC). The data in this brochure reflects 4 quarters of 2011 data published in the Institutional Outcomes Report on May 12, 2012. During this period of time, 1,325 hospitals submitted data and have successfully passed assessment and completeness checks.

The same calculation is made for both interventional cardiology procedures and surgical outcomes. Based on past interventional cardiology experience, patients with a specific pathological process have an expected result from angioplasty. The observed result from any type of procedure can then be compared to the expected result. An observed-to-expected (O/E) ratio is calculated. Anything equal to 1 is satisfactory. A ratio less than 1 is better than expected. At The Valley Heart and Vascular Institute, the O/E ratio for coronary angioplasty is 0.75.

Patients who undergo PCI at Valley have a lower complication rate and a lower risk-adjusted mortality than patients at other hospitals reporting in the most recently published data available from the CathPCI registry™.

### PCI OUTCOMES

<table>
<thead>
<tr>
<th>Event</th>
<th>Valley Heart &amp; Vascular Institute</th>
<th>CathPCI registry;™ all hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any adverse event</td>
<td>3.8</td>
<td>7.1%</td>
</tr>
<tr>
<td>Composite: death, emergency CABG, stroke or repeat target revascularization</td>
<td>1.8%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Post-procedure MI</td>
<td>0.4%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Post-procedure MI for patients without CABG during admission</td>
<td>0.03%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Cardiogenic shock</td>
<td>0%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Heart failure</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>CVA/stroke</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Cardiac tamponade</td>
<td>0%</td>
<td>0.1%</td>
</tr>
<tr>
<td>New requirement for dialysis</td>
<td>0%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Bleeding event w/in 72 hours of the procedure</td>
<td>1.1%</td>
<td>1.7%</td>
</tr>
<tr>
<td>PCI in-hospital risk adjusted mortality (STEMI patients excluded)</td>
<td>0.5%</td>
<td>0.66%</td>
</tr>
<tr>
<td>Observed-to-Expected mortality</td>
<td>0.75%</td>
<td>0.98%</td>
</tr>
</tbody>
</table>
RADIAL ARTERY ACCESS FOR CARDIAC CATHETERIZATION AND ANGIOPLASTY

In many cases, people who experience chest pain or who experience a cardiac emergency – such as a heart attack – undergo a cardiac catheterization procedure to determine if and where the heart artery blockage is. The procedure also may be used to open blocked arteries that are limiting blood flow through the heart and preventing oxygenated blood from traveling properly through the body. Cardiac catheterizations are performed on more than 1 million Americans each year.

During most traditional cardiac catheterization procedures, a cardiologist uses the femoral artery in the groin as the entry point for a catheter tube, which is guided through the body’s arteries to the heart. The radial artery approach allows a cardiologist to insert the catheter through the radial artery in the wrist to diagnose cardiovascular disease and treat blockages with angioplasty.

Radial artery catheterization offers patients several benefits:
- Less bleeding, meaning less chance of needing a blood transfusion
- Less risk of nerve trauma
- Lower rates of complication
- Shorter recovery/more comfortable (patients can sit, stand and walk almost immediately after the procedure rather than having to remain flat and immobilized in bed for several hours)

For more information about radial artery catheterization, or the comprehensive array of services available at the Valley Heart and Vascular Institute, please call 201-447-8456.

TREATMENT FOR PATIENTS WITH ACUTE MYOCARDIAL INFARCTIONS

Patients with acute myocardial infarctions managed with PCI at Valley have a lower complication rate compared with the registry aggregate:

<table>
<thead>
<tr>
<th>Event</th>
<th>Valley Heart &amp; Vascular Institute</th>
<th>CathPCI registry™; all hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any adverse event</td>
<td>9.9%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Cardiogenic shock</td>
<td>4.3%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Heart failure</td>
<td>3.5%</td>
<td></td>
</tr>
<tr>
<td>CVA/stroke</td>
<td>0.5%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Cardiac tamponade</td>
<td>0.2%</td>
<td>1.8%</td>
</tr>
<tr>
<td>New requirement for dialysis</td>
<td>0%</td>
<td>70%</td>
</tr>
<tr>
<td>PCI in-hospital risk adjusted mortality (patients with STEMI)</td>
<td>1.87%</td>
<td>5.68%</td>
</tr>
</tbody>
</table>

The O/E ratio for patients treated at Valley for an ST elevation myocardial infarction is 0.33.
A recent study reported in *JAMA*¹ assessed data from 107,018 Medicare patients who underwent elective PCI procedures, and found no increased risk of needing to being readmitted to the hospital or having a higher mortality in the 2 to 30 days after the procedure when compared to patients who remain in the hospital overnight. Unfortunately, given this impressive statistic, patients rarely are sent home the same day. At The Valley Heart and Vascular Institute, we recognize the importance of sending patients home as soon as it is clinically safe and feasible and we offer same day discharge for appropriate patients. Understanding that same day discharge is not possible for all patients, we have established a protocol to identify patients for whom it is appropriate.

Criteria for same day discharge:

**Pre-Procedural:**
1. Age less than 75 years.
2. Weight greater than 65 kilos and less than 110 kilos for femoral approach.
3. Creatine less than 1.2.
4. Non-complex anatomy: <2 lesions. No LMCA/bifurcation lesions/CTO.
5. LVEF > 35% without significant valvular disease/CHF.

**Procedural:**
1. No hemodynamic, allergic, or rhythm complications requiring treatment.
2. No IIb/IIIa agents.
3. No vascular complications.
4. Case duration ≤ 90 minutes.
5. Stent placement only (no POBA/Atherectomy).
6. Sheath size no greater than 6f.
7. Cases are overnight if:
   a. Multiple sticks to gain access.
   b. ≥ 3 stents are used.

**Post-Procedural:**
1. No post-procedural symptoms.
2. No EKG changes.
3. Satisfactory pre-discharge ambulation/voiding/mental status.
5. No vascular concerns.

All patients who are discharged the same day receive a post discharge phone call the next day by a registered nurse to ensure that they are healing well, and to answer any questions they may have.

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ELECTROPHYSIOLOGY

Electrophysiology is a subspecialty of cardiology, which examines the conduction system and electrical stability of the heart by recording and stimulating from within the cardiac chambers. It is the fastest growing area in cardiology. Abnormal rhythms, formerly only treated by medications, can now be treated by sophisticated and highly specialized treatments, such as implantable devices and catheter ablation.

With the most sophisticated technology available in the field, Valley Hospital electrophysiologists take great pride in offering a full-range of the most effective treatments for a broad range of heart rhythm abnormalities.

For referral to a Valley Hospital electrophysiologist, call The Valley Heart and Vascular Institute at 201-447-8456, or visit www.valleyheartandvascular.com

LEAD EXTRACTION

When electronic leads from pacemakers or ICDs are not working properly because of malfunction, breakage, scar tissue around the lead, or infection at the lead site, they need to be removed and replaced. Removal can be challenging when using common methods, such as traction or surgery. The Valley Hospital’s Department of Electrophysiology has extensive experience using laser lead extraction for the safe removal of chronic pacemaker and defibrillator leads.

The Valley Hospital’s Department of Electrophysiology was a pioneer in using laser lead extraction for safe removal of chronic leads. Laser lead extraction has been proven successful in 98 percent of cases, with a major complication rate of only 0.8 percent.
Valley was first in the state to use magnet-guided technology to enhance the precision and safety of procedures to treat certain heart rhythm problems, or cardiac arrhythmias. Cardiac arrhythmias are disturbances in the regular rhythm of the heartbeat. The acquisition of the new technology, called Stereotaxis Niobe, continues a tradition of innovation at Valley in the treatment of cardiac arrhythmias. Valley was the first hospital in New Jersey to offer catheter ablation — a non-surgical approach — and a minimally invasive surgical procedure for the treatment of atrial fibrillation, the most common form of cardiac arrhythmia.

The Stereotaxis system allows physicians to treat cardiac arrhythmias with a greater degree of safety and precision by driving powerful magnets positioned near the patient with sophisticated software used by the physician. The software maps a pathway through a patient’s blood vessels and heart to the diseased heart tissue, and the magnets lead a soft catheter gently along this pathway by guiding its magnetic tip. This enables the physician to safely position the catheter in the precise location of the heart’s malfunction. The physician can then activate the catheter and effectively deliver the required treatment.

In addition to the benefits associated with more precise catheter placement, the Stereotaxis catheter’s innovative gentle-touch design makes it possible to navigate and touch hearts and blood vessels in a softer, more accurate way than ever before.

The magnetic navigation system is an innovation in cardiovascular care. The computer navigation combined with the gentler catheter makes the catheter placement safer and more precise, allowing access to remote areas of the heart that were difficult, if not impossible, to access before. The potential benefits to patients include shorter procedures, faster recovery time, less exposure to X-ray radiation, less risk of serious complications from damaging blood vessels or heart tissue, and less likelihood of referral to more invasive open-heart procedures.

Clinical Trials
At The Valley Hospital we have a variety of ongoing clinical trials. Some of the trials currently taking place include studies to evaluate new drug-coated cardiac stents, new medications, new methods in cardiac surgery, combinations of medications, heart valves, a registry to monitor patients, and studies to evaluate the quality of life of patients who receive pacemakers.

For more information, call 201-447-8453 or visit www.valleyheartandvascular.com.
Focal Impulse and Rotor Modulation (FIRM) as introduced by Narayan et al of University of California, San Diego, has garnered enormous attention and has the potential to upend the science and the treatment of atrial fibrillation (AF). FIRM is based on the concept that AF is driven by localized electrical rotors or focal drivers and allows these rotors to be visualized in humans and thus targeted by limited ablation.

Our laboratory was selected to be the initial laboratory to test this technique outside of UCSD and now has the nation’s largest experience. We are pleased to report that the FIRM technique holds great promise to alter the substrate responsible for AF and greatly enhance the results across a series of challenging ablation patients. We have been able to identify rotors (see chart) in all patients and have been able to successfully terminate AF during RF delivery.

We are privileged to be part of a select group of international investigators who will determine the value of this highly innovative and novel concept and ablation tool. The results of our ablation series will determine whether this technique will be released to the larger electrophysiology community and ultimately adjudicate its potential value for treatment of AF in a variety of patients.

If you have patients whom you think AF ablation may be of value, please refer them to our service for consultation to determine their eligibility for ablation using the FIRM technique.

We will continue to keep you informed as we make progress using FIRM and look forward to multiple presentations and publications documenting patient outcomes and use of FIRM.

Figure 1: Rotors driving atrial fibrillation.

MEET THE DOCTORS OF THE ARRHYTHMIA INSTITUTE OF THE VALLEY HEALTH SYSTEM
For more information on The Arrhythmia Institute of Valley Health System, please go to www.Arrhythmia.org. On the site, you’ll find profiles of each doctor, clinical trials now underway, and important information on living with an arrhythmia. Offices are located in Ridgewood, NJ; Montclair, NJ; Manhattan, NY (midtown); Goshen, NY and Middletown, NY.

Pictured from left to right: Mark W. Preminger, M.D., F.A.C.C., Director, Implantable Arrhythmia Devices; Jonathan S. Steinberg, M.D., Director, Arrhythmia Institute; Aysha Arshad, M.D., F.A.C.C., Director, Lead Extraction Program; Tina Sichrovsky, M.D., Director, Attending Physician; Suneet Mittal, M.D., Director, Electrophysiology Laboratory; Dan L. Musat, M.D., Attending Physician.
Atrial fibrillation is a very fast, uncontrolled heart rhythm caused when the upper chambers of the heart—the atria—send rapidly firing electrical impulses that cause them to quiver instead of beat. It affects an estimated 2 million Americans and is responsible for as many as 70,000 strokes each year, according to the American Heart Association. Patients with atrial fibrillation treated at The Valley Hospital can be assured of access to the latest and most effective treatments and the widest range of treatment options.

Valley was the first hospital in New Jersey to offer catheter ablation for atrial fibrillation. When medications are not effective, or are not an option, catheter ablation, a non-surgical procedure, is considered the next best option prior to resorting to surgery. While catheter ablation has been successfully applied to nearly all types of arrhythmias with great success, ablation for atrial fibrillation has proven to be a more complex endeavor and is only available at select hospitals.

“The mechanism behind atrial fibrillation is more complex than that of other arrhythmias, and it tends to involve multiple regions of the heart, so very few hospitals offer catheter ablation for atrial fibrillation,” says Jonathan S. Steinberg, M.D., Director of the Arrhythmia Institute Professor of Medicine at Columbia University. “At The Valley Hospital, we have extensive experience in performing catheter ablation for atrial fibrillation.” The procedure involves inserting a specially designed thin tube called a catheter through a vein in the leg up to the heart. The catheter is then positioned at the site in the heart responsible for the abnormal rhythm. The tip of the catheter then delivers high frequency—or radiofrequency—energy to the site, destroying the abnormal electrical impulses, leading to the reduction or elimination of the atrial fibrillation. The procedure is done under anesthesia, and usually requires an overnight hospital stay.

The team at Valley performs 200 cases annually with an 80 percent complete success rate and a 95 percent overall success rate, with a major complication rate of only 0.69 percent.
Alex Zapolanski, M.D., F.A.C.C., F.A.C.S., Director Cardiac Surgery

**Board Certification:** American Board of Surgery/American Board of Thoracic Surgery

**Education:** University of Buenos Aires School of Medicine

**Internship:** Union Memorial Hospital

**Residency:** Cleveland Clinic Foundation, Cleveland, OH

**Fellowship:** Toronto General Hospital, University of Toronto; Clinical Associate Cleveland Clinic Foundation

Alex Zapolanski, M.D., F.A.C.C., F.A.C.S., is a Clinical Professor of Surgery at Columbia University's College of Physicians & Surgeons. Throughout most of his 30-year career, he has been conducting clinically oriented research. He has focused primarily in perfecting minimally invasive techniques in valvular surgery, coronary surgery (off-pump techniques), and atrial fibrillation surgery.

Dr. Zapolanski performs the full spectrum of cardiac procedures with special interest in extensive revascularization techniques with arterial conduits, minimally invasive valve surgery, aortic surgery, and surgical management of atrial fibrillation.

Dr. Zapolanski lectures internationally and has performed heart surgery in China, Russia, Indonesia, Cuba, and Argentina.

Jason S. Sperling, M.D., F.A.C.S.

**Subspecialty Director, Thoracic Aneurysm and Bicuspid Aortic Valve Program**

**Board Certification:** American Board of Surgery/American Board of Thoracic Surgery

**Education:** CUNY/SUNY Brooklyn 7-year BA/MD Program

**Residency:** University of Maryland Medical Center, Baltimore, MD

**Fellowship:** University of Virginia Medical Center, Charlottesville, VA

Jason S. Sperling, M.D., F.A.C.S., is board certified in both general and cardiothoracic surgery. He has an academic appointment as Assistant Clinical Professor of Surgery at Columbia University-Presbyterian Hospital and sits on the scientific advisory board of the Bicuspid Aortic Foundation. His cardiac surgery training was completed at the University of Virginia, and cutting edge research in cardiac surgery was done at Harvard University's Children's Hospital in Boston. He has co-authored numerous research papers in well-known peer-reviewed scientific journals.

Proficient in all aspects of adult cardiac surgery, Dr. Sperling has extensive experience in aortic aneurysm surgery, valvesparing (David) procedures and aortic valve repair as opposed to replacement. Additional clinical strengths include off-pump coronary surgery, mitral repair, stentless aortic valve replacement and minimally invasive hybrid procedures for both aneurysm and atrial fibrillation. He is the Principal Investigator of a thoracic aneurysm/bicuspid aortic valve research project aimed at identifying risk independent of aneurysm size alone.

Mariano E. Brizzio, M.D.

**Certified in cardiovascular surgery by the Colegio Argentino de Cirujanos Cardiovasculares**

**Education:** University of Buenos Aires School of Medicine

**Residency:** Instituto Sacre Coeur

**Fellowship:** Cleveland Clinic

Mariano E. Brizzio, M.D., is a Clinical Instructor in Surgery at Columbia University's College of Physicians & Surgeons. He is skilled in all types of cardiothoracic surgery, with special interests in minimally invasive approaches, valve surgery, atrial fibrillation, blood preservation techniques, and heart failure.

Throughout his career, Dr. Brizzio has participated in clinical research in the developing of an artificial heart, minimally invasive cardiothoracic surgery, lung transplantation, reoperative cardiac surgery, and blood preservation. His work has been published in well-known peer-reviewed scientific journals and presented at annual meetings of the American College of Cardiology, American Association of Thoracic Surgery, and The Society of Thoracic Surgeons. He is a member of the American College of Cardiology and The Society of Thoracic Surgeons.

Dr. Brizzio speaks English, Spanish, and Italian.

Jason S. Sperling, M.D., F.A.C.S.
Juan B. Grau, M.D., F.A.C.S., F.A.C.C.

Board Certification: American Board of Surgery/American Board of Thoracic Surgery
Education: Alcala de Henares University, School of Medicine, Madrid, Spain
Residency: NYU Medical Center, Department of Surgery, NY
Fellowship: NYU Medical Center, NY

Juan Grau, M.D., F.A.C.S., F.A.C.C. is an Assistant Professor of Clinical Surgery at Columbia University College of Physicians and Surgeons and Attending Cardiac Surgeon at The Valley Hospital. He is also an Adjunct Assistant Professor of Surgery at the University of Pennsylvania School of Medicine.

Over the past six years, Dr. Grau has researched the causes of the progression of valvular heart disease, particularly mitral valve prolapse and aortic valve stenosis. He is also involved in the field of aortic aneurysms, studying the different genomic and proteomic presentations of patients with ascending aortic aneurysms in the setting of bicuspid and normal aortic valves.

His research has been supported by major scientific organizations, including the National Institutes of Health (National Heart, Lung, and Blood Institute), the nation’s largest funder of biomedical research. His research also includes looking for biomarkers of aortic valve stenosis, an abnormal narrowing of the aortic valve, caused by degenerative calcification. Dr. Grau’s research has been published in numerous medical journals and books. He is a reviewer for several cardiology and cardiac surgery journals and basic science research publications and has been invited to lecture at multiple national and international forums.

Dr. Grau’s clinical interests involve complex aortic reconstructions, endovascular therapies, robotic valvular surgery, and all other forms of minimally-invasive aortic and mitral valve procedures. Hybrid coronary revascularization using robotics and off-pump multiple bypass grafting using minimally-invasive platforms are also part of his expertise.

Srinivasa Edara, M.D., F.C.C.P., Director, Cardiac Surgery ICU

Critical Care Medicine; Internal Medicine

Board Certification: Subspecialty Board of Critical Care/American Board of Internal Medicine/American Board of Sleep Medicine
Education: Guntur Medical College, India
Residency: Interfaith Medical Center-Brooklyn, NY
Fellowship: Mount Sinai Medical Center, NY; St. Luke’s-Roosevelt Hospital Center, NY

Srinivasa Edara, M.D., F.C.C.P., is a member of the American College of Chest Physicians, Society of Critical Care Medicine, and American Society of Sleep Medicine. He is experienced in the management of medical problems and complications in cardiac surgery patients. He is published in well-known scientific journals.

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For the past 30 years, Dr. Shaw has been responsible for the development of numerous cardiovascular research and quality improvement programs involving statistical methods and analysis, design of cardiac databases, and research design for prestigious hospitals and medical centers across the country. His noteworthy achievements include the implementation of several programs that have resulted in measurably improved efficiency and mortality outcomes in the treatment of cardiac patients.

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Should Very Elderly Patients Be Offered The Same Surgical Options As Their Younger Counterparts? A Comparison of Outcomes among Patients Below and Over 80 Years of Age Undergoing AVR With or Without CABG. 6th Joint Meeting of the Society for Heart Valve Disease & Heart Valve Society of America, June 25-28, 2011, Barcelona, Spain.


Perfusion strategies in MICS ECHI-ISMICS. Minimally Invasive Cardiac Surgery Summit 2011, Sept 7-9, North Carolina, US.


The utility of Functional Flow Reserve (FFR) in the evaluation of questionable coronary lesions. Combining anatomic and functional information to optimize the use of arterial conduits prior to CABG. Lisbon European Association for Cardio-Thoracic Surgery, October 1-5, 2011.


Our commitment to excellence has been recognized by The Society of Thoracic Surgeons, who gave us the highest rating - 3 stars - for our Coronary Surgery and Aortic Valve Surgery programs. These results position us in the top 14% and 3.2% respectively in the nation.