

The Ohio State University Richard M Ross Heart Hospital—Proof of Concept—Five Years of Growth and Development

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The Ohio State University (OSU) Richard M Ross Heart Hospital opened in November 2004 as one of the nation's first fully integrated academic hospitals dedicated to comprehensive cardiovascular patient care. This specialty hospital features a conceptually unique, easily modifiable design that allows the integration of medical, surgical, and procedural cardiovascular staff and physicians to provide seamless care within a single facility. The multidisciplinary team approach ensures quality and a personalized patient experience at the Ross Heart Hospital.

Nearly five years after completion, the Ross Heart Hospital facility, which is still only one of a few academic hospitals specializing in cardiovascular care, continues to undergo remarkable facility and clinical growth. The design concepts, organizational structure, and operational models, which were theoretical and highly questioned in the planning stages, have proved to be exceedingly effective in providing care to patients with cardiovascular disease.

The vision and strategic planning that went into the design of the Ross Heart Hospital continue to promote the type of care that validates the institutional commitment to the patient with cardiovascular disease. The on-campus location allows full physical plant and organizational and operational integration with the Dorothy M Davis Heart and Lung Research Institute, the OSU College of Medicine and Public Health, and the OSU Hospitals. As a result, the Ross Heart Hospital is uniquely positioned to continue its world-class leadership in advanced cardiovascular research and education, as well as in patient care.

Only months after opening, the Ross Heart Hospital was featured in the Spring 2005 *American Heart Hospital Journal* spotlight series. A critical piece of the vision statement included in the article recognized that in order to improve people's lives and be a leader in cardiovascular care, the facility is but one part of the requirements. Investment in recruitment and retaining a highly trained, expert care team dedicated to service excellence is equally, if not more important.¹ The Ross Heart Hospital's academic setting provides instant access both to the latest evidence-based clinical research and to state-of-the-art technology advances in cardiovascular care, which consistently attracts highly qualified, cohesive cardiovascular provider care team members.

Since its opening, the OSU Richard M Ross Heart Hospital has hosted representatives and visitors from over 200 hospitals and healthcare organizations from 17 countries who have come to see 'The Ross' first-hand to assist in their institutional planning. However, the measure of long-term success is not based solely on external curiosity or recognition, but ultimately on the continued evaluation of whether the ever-changing demand for cardiovascular patient care is being met. With an estimated 80,000,000 American adults (one in three) having one or more type of cardiovascular disease, the need for effective, highly efficient care for patients with cardiovascular disease is clear.²

Several goals identified by the OSU Heart Hospital Planning Committee and the OSU Medical Center leadership as measures of overall performance before the construction of the Ross Heart Hospital remain intact today and serve as performance metrics for the hospital.

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Figure 1: Ohio State University Ross Heart Hospital 2009



Among these critical measures are effective and efficient patient care delivery, patient and employee satisfaction, and the development of cardiovascular care provider teams dedicated to clinical excellence.

The Patient Care Difference

The Ross Heart Hospital is focused on providing clinically appropriate, high-quality cardiovascular care in a timely manner. The universal bed concept, which was part of the original design of the facility, remains extremely effective with only slight modification. The universal bed model adapts nursing care to the level of patient acuity and accommodates all specialized cardiovascular equipment within the patient room. This allows the majority of patients to remain in a single, private room throughout their hospitalization. Reduction of medical error and reduced operating expenses are achieved by eliminating frequent patient transfer.

The patient care experience incorporates a spacious, family-friendly environment with fold-out sofas and recliners in every room. The inclusion of family in the room and in the care process has been shown to have a positive impact on patient safety and quality outcomes. In a recent article by Brown,³ the family impact is highlighted: “We have seen enhanced family participation on customer satisfaction, as The Ross Heart Hospital’s latest patient satisfaction scores were the highest of all OSU hospitals. Staff attributes this high level of patient/family satisfaction to the universal bed care delivery model’s focus on patient and family needs.”

Each floor of the Ross Heart Hospital is dedicated to a specific service, ensuring highly specialized, personalized care. Thus, at times it is in the best interest of patient care to modify the universal bed approach, with post-operative and critically ill patients transferred to other

Ross Hospital nursing units to receive even higher levels of subspecialty care by ‘clustering’ such patients. However, overall the model “rises to the challenge of meeting the complex needs of patients.”³

Continuous quality assessment forms the basis for quality improvement. Regular public reporting and benchmarking identifies quality performance consistently in the upper categories of University Hospital Consortium (UHC) reported data.

Facility Growth

As evidenced by the following areas of growth, the Ross Heart Hospital is meeting or exceeding expectations as a leader in cardiovascular care.

In anticipation of the potential market share increases and expected demographic growth, the facility was architecturally designed to expand vertically by two floors over the inpatient bed tower and horizontally for the procedural tower. Significant cardiovascular patient volume growth started just before the Ross Heart Hospital opened and accelerated immediately thereafter, resulting in the original 90 inpatient beds being fully utilized immediately. Thus, only seven months after opening, the Board of Trustees recognized the need to increase bed capacity to meet growing demand and approved a \$34 million addition of two inpatient floors (60 beds). Design Group of Columbus, the original architectural design firm, surveyed Ross staff before expansion commenced and identified only minor recommendations for changes in design of the additional patient floors, validating the effectiveness of the original structural concept.

A large-capacity critical care elevator was added as part of the expansion. Transport of critically ill patients, the extended transport team, and all support equipment can be achieved easily. The critical care elevator is spacious (9 by 11 feet) and secure, and directly connects to the interior of the cardiovascular diagnostic invasive laboratory and operating room suites for expedient transport.

The expansion was completed in June 2008 (see *Figure 1*). Thus, only 31 months after the original opening of the Ross Heart Hospital, five floors with 150 inpatient beds are available to patients with cardiovascular disease. Accordingly, all cardiovascular specialty service lines, including acute coronary syndrome (ACS), cardiac surgery, vascular surgery, heart failure, and electrophysiology, are now able to consolidate their patients allowing more appropriate, personalized care and greater physician coverage.

Cardiovascular Services and Program Growth

A strategic planning initiative coincided with the initial design and construction of the facility. OSU leadership, with consultative assistance from McKinsey and Company, developed a plan for multiple areas of clinical growth with emphasis on cardiovascular services and program growth. Facility construction and expansion have demonstrated the success of this strategy.

The OSU Richard M Ross Heart Hospital has experienced tremendous growth (39%) in hospital admissions in the first four fiscal years since opening (see *Table 1*). In those same four years, the overall average patient (midnight) census of admitted (not observation) patients increased from 77 to 107. The expansion of the bed tower accommodated this demand by a 67% increase in available inpatient beds. The Ross Heart Hospital has become recognized for quaternary, multispecialty cardiovascular care. Advanced cardiovascular specialty care services continue to attract patients, physicians, and healthcare providers to the Ross Heart Hospital.

A five-physician vascular surgery practice relocated its clinical activities to the Ross Heart Hospital to coincide with its opening in November 2004. Unexpected at the time of initial planning, this addition resulted in a dramatic increase in the patient volume for vascular services.

In November 2006, five electrophysiology (EP) physicians relocated their practice to the Ross Heart Hospital. This group cited the advantage of access to support for research, technology, and education on an academic medical campus as the primary reason for their move. In order to accommodate the influx of more than 3,000 new EP procedures, two additional invasive laboratories were pressed into service and one of the existing EP labs was upgraded with Stereotaxis technology. Combining these advances, the specialty EP service line at the Ross Heart Hospital has realized 141% growth (see *Table 1*).

The heart surgery program has become a national leader for implantation of ventricular assist devices (VADs) (see *Table 1*). This large increase is attributable to transfers of very sick heart failure patients for the benefit of the team approach to the care of the patient with heart failure. A coordinated approach among surgeon, electrophysiologist, and heart failure specialist provides the best therapeutic approach for personalized cardiovascular care for each individual patient.

The Ross Heart Hospital Interventional Cardiology program has also expanded despite a national downturn

Table 1: Ross Heart Hospital Four-year Growth*

FY 2006 – FY 2009	2006	2009	% GROWTH
Ross admissions	5,368	7,453	39
Ross patient census	77	107	39
Available beds	90	150	67
ACC (Outpatient) Visits	12,416	23,137	86
Catheterizations	4,475	5,230	17
Angioplasties	1,744	2,045	17
EP procedures	1,966	4,748	141
Surgical procedures	2,332	3,046	31
Vascular procedures	900	1,774	97
VADS	18	50	179

**2005 not included as it was not a full year of operation.*

in catheterization and angioplasty numbers. This specialty service has sustained 20% growth in overall heart catheterization and interventional procedures in the last four years and has developed a very successful local and regional ST-segment elevation myocardial infarction (STEMI) program. The in-hospital STEMI alert team (available around the clock), regional emergency medical services (EMS) units, and the OSU emergency department collaborate to provide timely and appropriate treatment to cardiac patients. STEMI patients transported to the Ross Heart Hospital were treated well under the 90-minute national standard 100% of the time over the last two years and consistently average 60 minute or less arrival to percutaneous coronary intervention (PCI) times over that same period (see *Figure 2*). The regional STEMI program and the entire interventional cardiology team continue to lead the way in emergent cardiac care.

Significant growth in outpatient care is evidenced by the Ambulatory Care Center (86% growth in outpatient visits) within the Ross and the expansion of three off-site outpatient facilities in the Columbus metropolitan area. Featuring non-invasive diagnostics and advanced imaging services, the outpatient centers support the cardiovascular medical and surgical units with referrals.

Cardiovascular imaging essential to support cardiovascular diagnosis is available for both outpatients and inpatients. Multislice computed tomography (CT) imaging and cardiovascular magnetic resonance imaging dedicated to the cardiovascular patient are within the Ross Heart Hospital. Medical direction and image interpretation is provided by Ross Heart Hospital cardiologists.

Focused growth has occurred within the adult congenital disease program operated jointly with physicians and staff from Nationwide Children's Hospital in Columbus. Dedicated ambulatory care, imaging and interventional laboratory resources help to promote this program.

Figure 2: STEMI Door-to-balloon Time

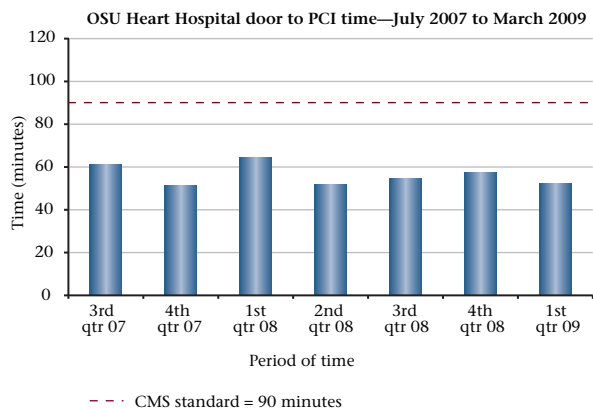
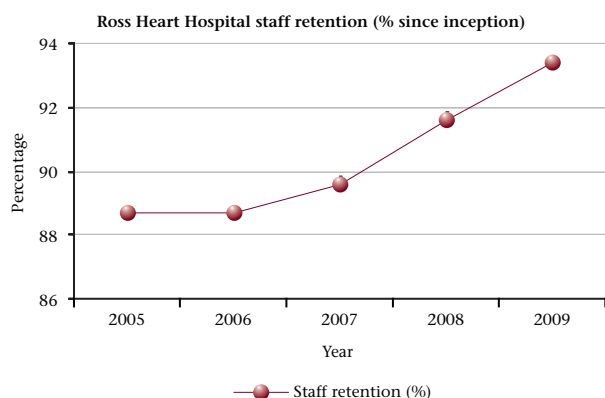


Figure 3: Five-year Ross Heart Hospital Staff Retention Rate



Nursing Excellence

The world-class reputation that precedes the high-performing nursing staff at the Ross Heart Hospital is a direct reflection of recruiting highly skilled nurses who are dedicated to providing advanced patient care day and night. In June 2009, the nursing staff of the Ross Heart Hospital and University Hospital earned a four year Magnet re-designation, which is the highest recognition a hospital can receive for outstanding achievement in nursing. Magnet-designated hospitals demonstrate higher nursing skill, lower mortality, higher nurse retention, and more successful recruitment. Only 5% of America’s hospitals receive Magnet recognition, with only 2% to date achieving re-designation.

Nursing care teams assess the patient acuity level at a maximum interval of every four hours with corresponding nurse staffing adjustment to meet individualized patient needs. All of these factors translate into more satisfied and cohesive nursing teams that provide personalized, skilled cardiovascular care.

The Ross nursing service has exceptionally low turnover rates. Retention of registered nurses (RNs), patient care

associates, and unit clerical associates has increased annually, with greater than 93% staff retention projected for fiscal year 2009 (see *Figure 3*). This serves as a measure of staff satisfaction. The universal bed model, cited as a major contributor to staff satisfaction, also provides Ross nursing staff with the unique advantage of the opportunity to learn advanced nursing skills without having to transfer to other units.

Patient Satisfaction

Patient satisfaction is a top priority for the OSU Ross Heart Hospital and the entire OSU Medical Center. Going well beyond routine patient satisfaction, the cardiovascular staff strives to exceed expectations. Accordingly, cardiovascular patients have provided feedback to suggest that they are highly satisfied with their care at the Ross Heart Hospital. Other locations within the OSU Medical Center generally fare well, but recent Press Ganey satisfaction surveys have placed the OSU Ross Heart Hospital as sustaining 98th percentile performance, with some of the Ross nursing units routinely achieving the 99th percentile. The nurse manager on each unit is accountable for patient satisfaction. Unit-based monthly meetings with physician champions are designed to review current survey information and to develop continuing improvement approaches. Some of these approaches have included daily nurse manager rounding, nurse shift change hand-off at the bedside involving patient and family, and post discharge phone calls to each patient by the nurse discharging that patient.

Staff Satisfaction

In the original article featuring the academic specialty hospital, a challenge identified was for the Ross Heart Hospital to “maintain a competitive advantage by being the employer of choice in the local cardiovascular care market and the ability to recruit and retain highly trained dedicated staff.”¹ This performance measure has been met. All clinical staff have been surveyed every two years since the Ross opened. Survey scores have been consistently high and assist in recruitment. Recruitment and retention of highly skilled physicians, who bring expert patient care experience and to whom clinical staff look for leadership, is equally important. Growth in physician and staff numbers is depicted in *Figure 4*.

Research and Education

The Ross Heart Hospital cardiovascular research faculty have successfully partnered with and utilized the services of the Dorothy M Davis Heart and Lung Research Institute to accomplish ongoing research to discover and

apply new treatment methods. Being part of a large academic medical center allows the Ross Heart Hospital to offer access to advanced technological equipment and extensive cardiovascular research opportunities to attract some of the most respected medical experts in their field. Physician scientists form the obvious link for translational research with projects in the Davis Heart and Lung Research Institute. The patient population within the cardiovascular services product line offers numerous candidates for clinical trials. A distinct clinical trials office supports this effort. One key results metric focuses on cardiovascular research initiatives. The cardiovascular program alone has over 140 clinical trials (a 10% annual increase since 2005) and approximately \$17 million in research award dollars.

The Ross Heart Hospital is the training ground for cardiovascular healthcare professionals at all levels of training and for all types of providers. Physician and nursing educators form the faculty for this vital part of the Health System mission.

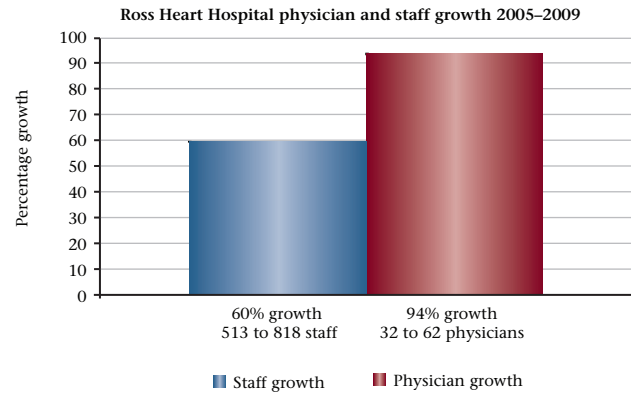
Financial and Governance Structure

The governance structure of the Ross Heart Hospital allows for independent function within the overall OSU Health Care System. Structured like most hospital boards, the Ross Heart Hospital Board is a separate board responsible for the governance and function of the Ross Heart Hospital and directly reports to the Medical Center Board, which in turn reports to the Medical Affairs Committee of The Ohio State University Board of Trustees. This structure allows the Ross Heart Hospital (and each of the four other hospitals) direct input to the Medical Center and the University as it relates to strategy, focus, and effort.

This structure further allows each individual hospital (one being the Ross Heart Hospital) to function independently and incur its own revenues and expenses and to be accountable to the Medical Center accordingly. Shared services with, purchased services from, and sold services to other hospitals within the Medical Center allow for clear accountability for the profitability of each unit.

The Ross Heart Hospital has had an annual positive margin and has been able to reinvest in the cardiovascular product line services. Investment has gone to program expansion, as well as supporting other areas of the OSU Medical Center mission. Concerns about financial viability prior to construction of the Ross Heart Hospital have been disproved by the results to date.

Figure 4: Ross Heart Hospital Five-year Physician and Staff Growth



Future Direction

The OSU Ross Heart Hospital has experienced tremendous growth in its first five years of operation. However, the first expansion of 60 additional beds and a critical care elevator is only the beginning. The procedural growth, particularly in EP and partly in interventional cardiology, has prompted a second expansion initiative for the Ross Heart Hospital.

Approved in April 2008, an \$18 million expansion and renovation will provide four additional invasive laboratories, bringing the new total to six EP laboratories and five catheterization laboratories. With the growing number of outpatient procedures, 23 additional observation, short-stay, private rooms will be added to replace 10 beds formerly used for procedure preparation and recovery. Completion of this expansion is due by June 2011.

As the healthcare world continues to advance and evolve clinically and technologically, the Ross Heart Hospital will experience the challenges of the American healthcare system along with all other hospitals and healthcare providers. Continuing to focus on efficient and effective care with an outstanding healthcare team will be the key to continued improved healthcare for our patients with cardiovascular disease.

Designing a superior facility, building an expert team of care providers, and responding to changes in the industry by improving processes and recognizing opportunities for efficiency are keys to continued success. With the aging population, the prevalence of heart disease and the demand for cardiovascular services is projected to increase by 16% per decade and death rates due to cardiovascular diseases are projected to increase 2.5 times faster than the growth of the population.² The Ross Heart Hospital was built to be flexible and adaptable to new technologies and responsive to the needs of the

patient population it serves, and has proved to be effective in meeting these goals.

Summary

With the development and construction of a dedicated heart and vascular hospital within its academic medical center environment, The Ohio State University delivered a clear message to the community and to the nation of the institutional commitment to provide the very best in

cardiovascular care to its patients. The community and the nation have responded, as evidenced by the further growth and development of the Ross Heart Hospital. The leadership and care teams of the Ross Heart Hospital must continue to respond to this patient care demand by adhering to the original vision statement: "Working as a team, we will shape the future of medicine by creating, disseminating, and applying new knowledge, and by personalizing health care to meet the needs of each individual."¹ ■

REFERENCES

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