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ARCHITECTURE REPORT

Heart care facility design in the 21st century

DESIGN TAKES ON NEW DIMENSION

by Constance Nestor

Heart disease is the number one killer in America, today. It's no wonder then, that hospitals throughout the nation are developing facilities to address the increase in this particular market. Statistics indicate that this market will continue to increase. At least 60 million people suffer from some form of heart disease, and with the 25 million seniors we have today, it will increase to 80 million within the next 15 years.

Guest Columnist

The key to making these facilities successful for both owners, healthcare professionals and patients is the design. Creative design strategies are helping reduce overall space requirements, reduce initial capital investments, and reduce operating expenses.

How is this possible? Design is taking on a new dimension, and technology is changing the way cardiac care is delivered. The result? It's a more effective, efficient facility that offers better cure rates.

Technology Drives Design

Traditionally, diagnostic and treatment areas for cardiac care were segregated by department (e.g., surgery, imaging, etc.). Today, integrated platforms are simplifying operations and providing enhanced flexibility. In smaller facilities, operating rooms, cardiac catheterization labs and interventional procedure rooms may be constructed within an integrated suite. In large facilities, one or two rooms located between surgery and cath lab suites may be equipped for both types of cases.

These multi-specialty suite clusters serve to further leverage the skills of recovery room staff who care for patients in a zoned Super PACU (caring for cath, interventional and surgery patients) located adjacent to critical care areas. In integrated interventional suites, surgery, radiology, anesthesia, recovery and information technology department boundaries break down as multiple disciplines collaborate in a single environment. The PACU may be used for swing critical care in times of peak census.

While heart surgeries are becoming less invasive, including Port Access Coronary Artery Bypass (PACAB) and Minimally Invasive Coronary Artery Bypass (MIDCAB), interventional cath procedures are becoming increasingly more invasive and complex. Procedures that were once only performed in and OR (e.g., bypasses and valve replacements) are now being accomplished in the cardiac catheterization lab.

Cath lab suites are being designed to match surgical environments, with sterile supply cores and clean corridors requiring restricted circulation. AORN standards for controlled flow of materials and instrument set-up are being observed. New cath labs should be equipped for both cardiac and peripheral procedures and have ECHO capability.

In high volume settings, some institutions have configured swing cath labs. The catheterization imager is swung back and forth between the two rooms such that there is zero room turnaround/down time for the equipment. By the time one cath is completed, the patient in the adjacent room is prepped and ready to go. Recent concern associated with infection control has curtailed the development of suites of this nature.

Combination rooms, such as MR/Angio rooms, enable interventional radiologists to optimize patient procedure times, thereby increasing the likelihood of improved patient outcomes and enhancing serviceline efficiencies. Two side-by-side rooms house the equipment; the patient is transported between the MRI and the angio areas on a single track during a single care-giving event.

High speed CT scanning equipment is a must for cardiac diagnosis. And don't forget, physicians need to be able to look at multiple image monitors simultaneously in order to compare/contrast the images at the same time. Monitors are expected to become larger in the short term. Space for CAD simulator training for interventional cardiology procedures should not be forgotten.

ECHO (echocardiagram) equipment is becoming standard in the operating rooms, as well, to assess the success of the surgical repair, which may need to be improved upon during the surgery. Most operating room suites can stand to improve turnaround times, inventory management, OR

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ergonomics, device connectivity and facility design. In larger services, clusters of 5 heart ORs, which share a single scrub and sub sterile area, will serve to reduce the amount of supplies on hand for surgeries. Voice activated robotic CABG (cardiac bypass surgery) surgeries and other robotic techniques will be commonplace in the very near future.

Freestanding heart hospitals: the latest trend

The demand for free-standing heart hospitals and centers has mushroomed within the past two years. We are often asked by healthcare executives to identify new facilities that are representative of 21st century design. Of the various architectural design heart projects underway at RTKL, I will point to three projects as representative of 21st century design:

- Indiana Heart Hospital, Indianapolis
- Freeman Heart Institute, Joplin, Miss.
- Texas Heart Institute at St. Luke's Episcopal Hospital, The Denton A. Cooley Building

Staffing is going to be critical over the next 10 to 15 years. The anticipation of 20 percent less staff to provide services with the expectation of 300 percent more patients (aging baby boomers) leads us to build more thoughtfully and efficiently. RTKL design criteria at the Indiana Heart Hospital specified that nursing staff not walk more than 25 feet to retrieve supplies in the CV recovery, critical care and pre/post operative areas.

In addition, comprehensive digitalized systems for physicians and referring hospital communications were incorporated. With a staff to patient ratio of 1 to 4 assumed, clear visibility between the three care teams has been provided. In addition, three traffic/circulation patterns are planned; the phase I rehabilitation circulation area includes family lounges and open interactive space.

The St. Luke's Episcopal Hospital's CV recovery area was zoned into Levels I-III, addressing patient length of stay and acuity. In integrated interventional suites, surgery, radiology, anesthesia, recovery and information technology department boundaries break down as multiple disciplines collaborate in a single environment. The PACU may be used for swing critical care in times of peak census.

RTKL has incorporated universal inpatient rooms with decentralized nurse centers at the Texas Heart Institute at St. Luke's Episcopal Hospital, The Denton A. Cooley Building in Houston and the Indiana Heart Hospital in Indianapolis. These acuity adaptable rooms allow future flexibility and capacity to manage future technological advances and changes in the delivery of heart care.

Modular design was important at the Indiana Heart Hospital that includes four suites of eight pre/post-operative rooms and three suites of eight inpatient rooms, for instance. Future expansion has been planned in advance and will be easily accommodated.

Family amenities are becoming increasingly important in the critical care environment. Sleeping space and kitchen areas are necessary to be competitive. At the Indiana Heart Hospital, the emphasis is on customer service, retention and process efficiencies. Patient/family amenities include concierge services and room service for patient meals. Patient lounges are planned for the comfort of homebound patients. At Freeman Heart Institute, state of the art technology compliments the human scale warmth of the facility. The cardiac gym was designed to overlook a tranquil garden scene.

Patient Intake Strategy

Heart and vascular disease must be diagnosed in the early stage in order to increase treatment options, lower the cost of care and minimize the loss of human productivity due to heart and vascular disease. Through wellness programs, screenings, education and rehabs - risk factors can be identified early on (e.g., blood pressure, cholesterol, exercise, and stress levels). Statistically, patients that receive wellness care at your institution will return to your facility when an illness event occurs.

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