Advancing to meet the health care needs of Kentucky and beyond

Strategic Plan 2011 – 2015
Contents

Introduction .......................... 1
Executive Summary ............... 3
Our Mission/Our Vision .......... 8
Environment/Future Trends .... 10
Clinical Programs ................. 12
Outreach ............................ 32
Clinical Performance .......... 37
Strategic Marketing .............. 47
Facilities & Technology .......... 49
Information Technology .......... 52
Medical Education ............... 54
Research ......................... 57
Investments ...................... 60

University of Kentucky
Lee T. Todd Jr., President
Kumble R. Subbaswamy, Provost
Michael Karpf, Executive Vice President for Health Affairs
Frank A. Butler, Executive Vice President for Finance and Administration
James W. Tracy, Vice President for Research
The initiatives outlined in UK HealthCare’s first strategic plan, *UK HealthCare Growing to Serve Kentucky: 2004-2020*, have succeeded beyond our highest expectations. Our accelerated pace of accomplishment indicates the state was ready for the university to fully assume the mantle of leadership in providing medical care to the people of the Commonwealth. This plan, *Advancing to meet the health care needs of Kentucky and beyond: 2011-2015*, is an evolution of our earlier plan and outlines the next steps in furthering our mission and vision.

In 2004 we committed to a strategy emphasizing advanced subspecialty care here in Lexington, while pursuing productive, mutually supportive relationships with regional and rural providers. We recognized efficiency, quality, safety and service as critical success factors. We also developed an operational model we have called the clinical enterprise – UK HealthCare.

The following pages document our major accomplishments since 2004 and outline key strategies and initiatives that will propel us even farther along the road toward our goals and our commitments to our patients and the missions of the university. Our original approach of offering advanced subspecialty care continues, and we will become a destination for patients even beyond our state’s borders in certain highly specialized services. Likewise, our strategy focused on developing relationships with other providers will continue, and we envision a natural progression into an even more highly organized system of care.

Special thanks go to the governors and members of the Kentucky Legislature who have embraced our far-reaching vision and have supported us in our objective to provide care on par with the nation’s best so that Kentuckians need not travel far from home and family to receive appropriate care.

Michael Karpf, MD
Executive Vice President for Health Affairs
UK HealthCare/
University of Kentucky
Executive Summary

In this document, the leadership of UK HealthCare (UKHC) reviews the organization’s progress in pursuing the strategies set forth in 2004 and outlines new strategies for 2011-2015 that build upon that initial plan.

2004 strategies

- Advanced subspecialty care
- Productive, mutually supportive relationships with regional and rural providers
- Quality, safety, efficiency and service
- Clinical enterprise operational model

Overall, the 2004 strategies have succeeded beyond even what the UKHC leadership could envision. Most of the gaps preventing UK HealthCare from offering the full spectrum of advanced specialty and subspecialty services have been filled, a fact corroborated recently by a third-party health care strategy group (see page 14). Today, our menu of services compares very favorably with leading academic medical centers located throughout the United States. A new opportunity is unfolding to take our now complete menu of specialty and subspecialty services and determine how these might be leveraged even beyond our traditional service area.

While initially anticipating a growth rate of 33 percent following the 2004 strategic plan, UK HealthCare actually experienced a growth rate of 63 percent – evidence of a pent-up demand for our advanced subspecialty services. In 2004, UK was at the 25th percentile in terms of academic medical center size. Over the course of the five years, we approached the 75th percentile. Increased volume and activity level helps UK attract faculty, research, grant funding and other opportunities that require certain volumes in order to be in the consideration set.
Second, relationships with regional and rural providers have been initiated and are in varying states of formality. Some are very casual relationships, while others are beginning to take on more structure. Our goal was to determine whether such relationships could be mutually beneficial; our experience gives us every reason to think this is the case. With experience working together, we have developed trust and confidence and believe we are now well-positioned to formalize relationships and create a more structured system of integrated care.

Third, the university’s clinical services, as viewed in 2004, were struggling due to organizational silos and highly segmented services. It was clear that many of the 2004 strategies could never succeed unless we could operate in a more integrated fashion, assuring a smooth, seamless continuum of care for our patients. The clinical enterprise – UK HealthCare – was quickly formed and through thoughtful consideration and several organizational changes, we have initiated, and in many cases completed, much of the organizational change necessary to enable us to operate as a true integrated system. Undoubtedly, we will continue to adjust as needed moving forward, but the major changes seem to be behind us.

Finally, the preceding three strategies were instrumental in helping us address the fourth: improving our performance in patient quality and safety, operational efficiency and service excellence. This report will document significant improvements in all three areas (pages 37-48), as evaluated by our own metrics and those of third parties. Of course, none of these strategies existed in isolation, so improvements achieved as a result of pursuing one strategy often contributed to progress in another strategic area.
Supportive efforts in marketing, information systems and investments in facilities and technology bolstered and supplemented our progress in these four strategic areas. A key factor in pursuing a strategy of system integration is information technology, which supports and makes possible collaboration around the patient’s care among many providers often geographically dispersed. Our progress in the area of the electronic medical record (EMR) is a real strength today and in our plans to move forward. In addition, we have made – and will continue to make – significant investments in facilities and technology that also enable us to pursue all of the outlined strategies. Since 2004, our capital investments total $870 million. The most visible of our investments is the new 1.2 million square foot pavilion nearing completion of the first phase of its construction. This much-needed facility supports our strategy of advanced subspecialty care and will form the centerpiece of the University of Kentucky Albert B. Chandler Hospital.

Finally, the strategies outlined above are enabling UK HealthCare to contribute more to the education and research environment of the University of Kentucky. While both areas have been employing their own strategies for growth, it is clear the physical, operational, and financial growth and contributions achieved by UK HealthCare are supporting demonstrated growth in both education and research.
Looking beyond: Becoming a clinical destination

Our original approach of offering advanced subspecialty care will continue, but with our new capabilities and breadth of expertise, we are now poised to serve as a clinical destination for patients from beyond our original market boundaries. The public’s interest in UK HealthCare services can be expected to be very broad in areas near Lexington and the Bluegrass region. As distance from Lexington increases, we expect the market’s interest to become more focused on more specialized services so that at the farthest extent of our reach it will be focused on only a handful of highly specialized services.

The distance at which we may be able to attract this business will depend, to a degree, upon the reach of our competition also equipped to provide such services. This group includes Ohio State University, University of Pittsburgh, University of Virginia, Vanderbilt University, Washington University and Indiana University. The area we are able to serve will vary by each “destination” service and the outreach of the nearest competitor.
Looking beyond: Relationships become more integrated

Likewise, our original strategy to develop relationships with other providers will continue. In some cases we need to initiate new relationships or cultivate established ones to build trust and confidence. In other cases the relationships are ready to become more structured so that as we gain experience and the information technology to do so, we envision a natural progression into an even more highly organized system of care.

Based on what we are seeing at the national and state level, it is clear Kentucky can expect change to the way health care is delivered. Change will be essential to address calls to reduce the burden of cost, enhance access, and maintain or improve quality. Health care payment incentives will likely change from fee for service to those based on quality and outcomes over the course of disease. The latter model requires more coordination across the continuum of care. Development of highly integrated systems among key providers presents the best option for addressing these external forces.

This is an exciting time for UK HealthCare. We have been successful at many of the important initiatives we have set out to accomplish. Although the current climate of change is one of uncertainty, we believe the strategies outlined within for 2011-2015 provide the greatest opportunity to meet the challenges of a changing environment, as well as build upon proven strengths and our unique place in the health care market of Kentucky and beyond.

- June 6, 2010

“If you don’t like change, you’re going to like irrelevance even less.”

– General Eric Shinseki, Chief of Staff, U. S. Army
Fifty years ago, under the leadership of Governor Albert B. “Happy” Chandler, the University of Kentucky opened the UK College of Medicine and established the Albert B. Chandler Hospital. The medical college and the new state-of-the-art hospital were founded to address a physician shortage and inadequate clinical services for the people of central, southern and eastern Kentucky.

Over the years, the College of Medicine and Chandler Hospital have grown into a substantial academic medical center and now serve as a regional referral center. On the campus, five additional health care-related colleges have joined the College of Medicine in producing clinicians, teachers, researchers and health experts for the Commonwealth and the nation, while creating a nucleus of intellectual inquiry matched by few academic medical centers.

Six years ago, the UK College of Medicine, the practice plans and Chandler Hospital were organized as a clinical enterprise – UK HealthCare – under a new Executive Vice President for Health Affairs in an effort to better support the university’s responsibilities to the Commonwealth. Now the University of Kentucky and its health care system have the requisite synergy and infrastructure to fully and aggressively support its missions: teaching, research and patient care.

UK HealthCare specialists and staff offer a broad array of services, from primary care to the most sophisticated quaternary care. These programs support teaching and research efforts as well. Revenues produced by clinical services help subsidize education and research, as they do at most universities. Without a successful clinical enterprise, research and education will falter.

**Mission**

UK HealthCare is committed to the pillars of academic health care – research, education and clinical care. Dedicated to the health of the people of Kentucky, we will provide the most advanced patient care and serve as an information resource. We will strengthen local health care and improve the delivery system of the Commonwealth by partnering with community hospitals and physicians. We will support the university’s education and research needs by offering cutting edge clinical services on par with the nation’s best providers.
Because of the breadth and quality of faculty recruited and our educational and research agenda, critical clinical programs are made available to the state ensuring Kentucky has access to the best of contemporary care.

- UK HealthCare has the only Level I Trauma Center serving the eastern half of the state.
- Kentucky Children’s Hospital fills a critical need for pediatric specialty and subspecialty services.
- The UK Markey Cancer Center, widely recognized for excellence in cancer care, including bone marrow transplantation, assures Kentuckians access to groundbreaking new approaches to malignant diseases.
- The UK Gill Heart Institute has attracted talented specialists from the nation’s leading heart centers.
- The UK solid organ transplant program is the only program of its kind within the region.
- The neurology and neurosurgery programs, combined in the Kentucky Neuroscience Institute, are recognized nationally.

To ensure this expertise is shared where the need exists, UK HealthCare is working closely with local providers to enhance appropriate clinical services available in rural areas of the state. Patients are better served when they receive most care close to home – leaving their home communities only when they require the very specialized care an academic medical center provides.

Vision

Become a Top 20 academic medical center serving Kentucky and beyond that strives to:

- Provide a broad range of advanced subspecialty care so that Kentuckians need not travel outside Kentucky for medical care
- Become a clinical destination serving Kentucky and beyond for select highly specialized services
- Support rural health care, collaborating closely with community providers to enable residents to receive appropriate health care in their local communities
- Mature collaborative relationships into a well integrated health delivery system that can respond to a changing health care environment and provide high-quality, cost-efficient health care
- Support the research and teaching missions of the university
During the last five years, the health care environment, locally and nationally, has undergone many changes as the population ages, government funding sources seek health care savings and efficiencies, and the dynamics force a hard look at the way health care is delivered in Kentucky.

**The Kentucky health care marketplace**

UK HealthCare’s original service area has a population of 1.7 million people in central and eastern Kentucky. The rural, low-density service area has many small, independent hospitals that are transferring their complicated patients in increasing numbers to UK HealthCare because they are unable to care for them. During calendar year 2009, UK HealthCare averaged nearly 650 hospital-to-hospital transfers per month from referring providers. These hospitals also have limited resources to address declining reimbursement and changing incentives.

Many rural Kentucky communities are faced with a scarcity of primary care physicians, specialists and subspecialists, the original impetus behind UK’s outreach initiative described on page 32.

Demand in the original UK HealthCare market will increase due to the aging of the population. Lifestyle, economic and access issues in Kentucky drive up the incidence of disease, and mortality rates are higher than in most other states. Premature deaths are 20 percent higher in Kentucky than the U.S. average. Kentucky has the highest age-adjusted cancer mortality rate in the country.
**National issues and health care reform**

Redesign of the health care delivery system is inevitable. Key issues driving change are:

- Public concern for quality, safety and access
- Greater customer/patient independence and awareness
- Burden of high health care costs
- Changing reimbursement models moving away from payments based on volume to those based on quality and outcomes

Costs have continued to escalate despite many cost containment measures. With the implementation of national health care reform, we can expect changes in the way health care is delivered. The catalyst for real change in the delivery model will be new reimbursement approaches that move from payments based upon a fee for service to those based upon outcomes and quality. This is viewed as essential to reduce the burden of cost, enhance access and maintain quality. However, a payment model based on outcomes and quality requires more coordination across the continuum of care.

All of the payment models that emphasize efficiency and quality have several common elements:

1) All payments are value-based even if the major goal is cost containment
2) It is assumed that medical guidelines, standards and quality measures will play important roles in management
3) All systems require real-time electronic medical records
4) Most of the systems use teams to provide care

Development of highly integrated systems among key providers is the best option for addressing this changing environment. Fortunately, UK HealthCare already has the critical components of a system:

- UK Chandler Hospital, equipped to treat complex patients
- UK Good Samaritan Hospital, a cost-effective setting for less acute cases
- A multidisciplinary group of 800 physicians connected through joint planning, management and information technology

Going forward, we must focus on expanding outpatient access and capacity and further developing linkages, networks and outreach initiatives as part of our commitment to support local providers. We must also define, understand and set a timeline for system development.

UK HealthCare requires a broad geographic area to reach the population needed to support high-quality, cost-effective, advanced subspecialty services. A system approach would expand the geographic reach to enhance access to appropriate volumes of these patients.
Over the last five years UK HealthCare has become a thriving health care organization. New leadership developed a strategic plan in 2004 and since then, the organization's success has exceeded expectations.

**Growth projections exceeded**

Among the hallmarks of this success is a 66 percent growth in inpatient discharges, from 19,098 in FY2003 to 31,768 in FY2009. This growth propelled UK HealthCare from the 25th percentile in size among academic medical centers to a favorable position approaching the 75th percentile. Much of the growth occurred from patients who reside beyond the Bluegrass with 40 percent of UK HealthCare patients traveling from areas outside the Bluegrass in FY2009. Most of those who travel such a distance come with complicated or rare conditions requiring advanced subspecialty care, positioning UK HealthCare as a regional referral center.

To serve the growing demand for UK HealthCare services and to fill gaps in advanced subspecialty expertise, UK HealthCare has been highly successful in recruiting additional physicians, increasing the full-time clinical faculty from 462 in FY2004 to 604 in FY2010.

UK HealthCare is addressing the need for additional facility capacity to meet the growing demand for services. Planning, design and financing are completed and construction is under way for a replacement hospital for UK Chandler Hospital. The first areas of the new pavilion are due to open in 2010 and 2011. UK Good Samaritan Hospital, a local community hospital, was acquired in 2008. Both UK Chandler and UK Good Samaritan hospitals operate under the same Medicare provider number.

To better serve Kentuckians, UK HealthCare has made great efforts to develop relationships with rural health providers. UK HealthCare has earned the trust of many rural providers by working with these hospitals and physicians to enhance their competencies to treat patients in their own communities, strengthening providers in these challenging economic times, and providing appropriate subspecialty care in outreach clinics.
Recognition

During the past five years, UK HealthCare has been recognized by a number of organizations. Chandler and Kentucky Children’s Hospital have received Magnet certification for nursing excellence. In 2006, UK HealthCare was ranked nationally as a “Performance Improvement Leader” by the Thomson Reuters organization. UK HealthCare has been recognized twice in Thomson Reuters’ “100 Top Hospitals®: Benchmarks for Success” ranking. In 2007, UK HealthCare received the University HealthSystem Consortium “Rising Star Award.” And both Chandler and Good Samaritan hospitals have performed well in triennial accreditation surveys.

Specialized capabilities have been recognized with certifications or verification in stroke, adult and pediatric trauma, and advanced VAD (ventricular assist device). We were named an Anthem Blue Distinction Center for Rare and Complex Cancers, and the PharmacistCare program received a Best Practices Award from the American Society of Health-System Pharmacists.

The number of physicians recognized by Best Doctors in America® has grown from 64 in 2005 to 123 in 2009; with a similar increase in those recognized by America’s Top Doctors® (16 to 21). Selected programs at UK HealthCare have been recognized for five years in a row by U.S. News & World Report’s “America’s Best Hospitals” ranking.

For the past five years, UK HealthCare has maintained a special focus on the following clinical programs as we continue to develop and enhance destination services:

- Kentucky Neuroscience Institute
- Orthopaedic Surgery & Sports Medicine
- Digestive Health
- Gill Heart Institute
- Markey Cancer Center
- Pediatrics
- Maternal-Fetal Medicine

Growth in clinical faculty is responsible for much of the overall growth in the UK College of Medicine.
Assessments

As part of the strategic planning process, an external consulting firm (Sg2) was asked to perform an objective assessment of our technologies and clinical programs. Part of this process rated our aggressiveness in adopting and utilizing technology for cutting-edge care. Our score was consistently rated positively as an early adopter of technology across our major service lines. In addition to our internal score, we asked to be compared to other benchmark academic medical centers (AMCs). We were benchmarked against six leading academic medical centers – all considered among the nation’s best. As noted in the charts below, we compared very favorably to the benchmark institutions.

In addition to assessing technology, the consulting firm also determined if there were any major gaps in our clinical programs or technology that should be considered for the future. The gaps were minimal and not significant.

Technology gaps

- Intra-operative MRI
- Hybrid operating rooms

Space for both of these technologies is planned for future operating room suites.

Clinical gaps

- Neonatal ICU design (family-based)
- Cancer genomics
- Natural orifice transluminal endoscopic surgery (NOTES)
- Device-based interventions for epilepsy and movement disorders

These clinical programs are currently under assessment for future planning and investment.
Innovation

As illustrated at left, UK HealthCare is well-positioned with leading AMCs as an early adopter of medical advances and technology. In areas where we intend to become innovators, we must have the expertise, population base and geographic footprint to become a clinical destination.

The five-year plan established in 2004 focused on the development of advanced subspecialty care to serve our market. Using case mix index (CMI) as a measure, UK HealthCare has been very successful in drawing the most complex cases from the far reaches of its market. Now that UK HealthCare has been effective in developing a broad range of advanced subspecialty care, our focus will turn to strengthening programs.

At left is average CMI per case in FY09*. Case mix index (CMI) indicates acuity and case complexity as measured by the amount of resources required to treat the case. Overall, UK Chandler Hospital receives more of the complex cases within each market, and the complexity of cases referred increases with distance from Lexington.

* CMI average excludes DRG 795, normal newborns.

UK HealthCare average case mix index reaches the 75th percentile of academic medical centers, indicating the enterprise is seeing the same type of complex patients as the leading medical centers.
As we develop and refine subspecialty services, we expect to become a provider of certain select services beyond our natural boundaries. Broadening the system’s geographic footprint beyond Kentucky also enables us to generate the case volumes necessary to support such programs. Our development will be focused on advanced subspecialty services not offered at other hospitals in our market.

Map showing UK HealthCare expanded service footprint and population (in millions). The extent of the new market will be defined somewhat by the presence and activities of academic medical centers offering comparable services.
**Initiatives mature, evolve**

UK HealthCare will continue to provide primary care to support UK teaching programs and serve university families. In specialty care, UK HealthCare plans to continue to develop partnerships with community providers, focusing on enhancing competencies and services locally to allow appropriate patients to remain in their communities for care. Existing relationships and affiliations will become stronger and the result will be a more highly organized and structured system of care. The nature of our relationships will depend upon location and population.

---

UK HealthCare’s strategy of building advanced subspecialty care, broadening geographic boundaries in select services and strengthening the capabilities of community providers to offer basic care in the community is good for Kentuckians. Our vision is to be a stronger advanced subspecialty academic medical center, with stronger community providers and greater access to excellent care at the right place at the right time for Kentucky and beyond.

---

**Clinical Relationships**

- **FAYETTE** 0-15 MILES
- **BLUEGRASS** 15-30 MILES
- **ORIGINAL TERTIARY MARKET** 30-100 MILES
- **100 + MILES**

Distance from Lexington and size of partners are key drivers for defining clinical relationships.

---

**Summary of 2011-2015 Strategies**

Advancing to serve the health care needs of Kentucky and beyond.

- Continue to refine approach to subspecialty care
- Continue to mature relationships with regional providers
- Rely on local hospitals to organize primary care
- Provide leadership in addressing state’s trauma needs
- Expand appropriate specialty care at selected local facilities
- Contemplate expanding primary care for complex patients
- Develop advanced subspecialty care as destination services
- Expand market footprint to attract volumes necessary for quality outcomes and program development
UK HealthCare is the regional leader in neurosciences and provides a broad spectrum of services. Over the last five years, accomplishments in this area include:

- Opening the new Kentucky Neuroscience Institute clinic, successfully integrating neurology, neurosurgery and neuroradiology into one multidisciplinary practice; and offering patients access to multiple physicians and noninvasive testing in one location during one appointment.

- Establishment of an interventional neurovascular program.

- Development of region’s only comprehensive Level IV Epilepsy Center with expanded adult and pediatric monitoring units.

- Establishment of deep brain stimulation program for movement disorders.

- Establishment of the region’s first Primary Stroke Center with a comprehensive stroke team. UK Comprehensive Stroke Center provides an on-call stroke neurologist, endovascular surgical techniques such as clipping and coiling, the region’s only Merci Retrieval System, and research protocols that may extend treatment windows.

- Establishment of a comprehensive national Multiple Sclerosis (MS) Center providing cutting-edge therapy to patients with MS throughout the region and the Commonwealth.

- Establishing a Headache and Pain Clinic devoted to the management of migraine and other forms of headache.

Neurology and neurosurgery inpatient discharges have grown 96 percent from FY04 to FY10.
Strategic Initiatives

Regional Program Focus: Stroke is a critical and growing health concern in Kentucky with the age-adjusted cerebrovascular mortality rate 15 percent higher in Kentucky than the U.S. average. To leverage the UK specialty stroke expertise into outlying areas, UK HealthCare is forming a large network of community stroke care providers. The UK HealthCare experts in stroke treatment will be utilized in clinical decision-making and therapeutic management in local communities and will provide education and training to community-based clinicians. UK faculty can guide community physicians in the administration of the time-sensitive “clot busting” TPA procedure, eliminating time lost in transport of the patient to a stroke center. The use of protocols will streamline the process and facilitate transfer of complex patients requiring the advanced care of the UK HealthCare stroke center. Second, KNI will continue to offer innovative approaches to spine care and build relationships with community physicians.

• Comprehensive stroke center
• Surgical spine
• Neuro-trauma
• Headache & facial pain

Growth Strategy: KNI will continue to focus on being a comprehensive neuroscience center covering a broad array of destination services. Some approaches include enhancement and expansion of KNI’s national and international reputation through research publications and speaking engagements, building upon the successful stroke program to improve referral patterns for low-volume destination services, enhancement and expansion of the existing competitive advantage in unique high-end programs, and recruitment of outstanding clinical neuroscientists and expansion of research efforts.

Destination Services

• Dementia
• Neuro-infectious disease
• Neuromuscular/ALS
• Multiple sclerosis
• Neuro-oncology
• Epilepsy – medical & surgical management
• Movement disorders/Deep brain stimulation
• Interventional neurology for vascular abnormalities
• Pediatric neurology and neurosurgery
Gill Heart Institute (GHI)

Heart disease continues to be a major health problem in Kentucky, with the age-adjusted death rate due to heart disease in Kentucky ranked fifth highest among the 50 states and more than 18 percent higher than the U.S. average. Building the cardiovascular program has been a major focus over the last five years. Key accomplishments include:

- Creation of an advanced cardiovascular imaging center with the latest generation of dual source 64-slice CT scanners, as well as 1.5 and 3 Tesla MRI units.
- Updating the cardiac nuclear imaging lab.
- Integration and upgrading of cardiac imaging at Good Samaritan Hospital.
- Enhancement of pediatric heart and congenital heart programs with the recruitment of additional physicians. Those who suffer from congenital heart defects now have the option for surgery.
- Development of a ventricular assist device (VAD) program with accreditation as a destination therapy for heart transplantation.
- Opening of a cardiopulmonary rehabilitation center at Good Samaritan Hospital.
- Expansion of clinical outreach by offering 47 clinics per month in nine counties.

Cardiovascular Adult Volumes

Cardiovascular discharges have grown 33 percent from FY04 to FY10. At the same time, outpatient visits have grown 44 percent from FY04 to FY10.
Strategic Initiatives

**Regional Program Focus:** GHI will continue to focus on being a leader in cardiovascular care and will create a cardiovascular service line. Second, the number of cardiology patients served will be increased through expanded relationships with community providers, coordination of services at current sites and more access through the establishment of additional outreach sites or community divisions. This broader outreach will include joint recruitments with community providers and outreach clinics. As an extension of this outreach, GHI will be developing an affiliate network with community providers to strengthen the services available at the community level, provide the patient with a seamless spectrum of care and offer educational programs. Electronic linkages between the GHI Advanced Cardiovascular Imaging Program and community providers who have cardiovascular imaging technology will enable UK specialists to read images and provide consultations. With the most advanced cardiac imaging technology and expertise in the region, GHI will focus on being an industry leader in the noninvasive diagnosis of cardiac disease. Third, in taking on a greater leadership role in cardiac care, GHI will work to enhance the EMS role in activating cardiac care, establish a certified Chest Pain Center, and develop protocols for local and regional emergency departments.

- Chest pain
- Interventional cardiology
- Preoperative screening
- Peripheral vascular disease
- Heart failure
- Cardiac imaging
- Electrophysiology
- Cardiothoracic surgery
- Congenital heart disease

**Growth Strategy:** To expand its footprint, GHI will build community relationships through affiliates in the tertiary market and beyond who benefit from clinical outreach and image submission and interpretation. These relationships will focus on identified destination services. GHI also intends to further develop and enhance its well-respected service for heart failure patients into the leading regional program of choice for treatment and clinical management of the condition. Significant efforts will be placed on expanding heart failure outreach throughout Kentucky and bordering states. This initiative will embrace the growing and highly specialized areas of electrophysiology, ventricular assist device (VAD) implantation and heart transplantation.

<table>
<thead>
<tr>
<th>Destination Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural heart disease (pediatric and adult)</td>
</tr>
<tr>
<td>Advanced heart failure</td>
</tr>
<tr>
<td>Ventricular assist device (VAD) implantation</td>
</tr>
<tr>
<td>Heart transplantation</td>
</tr>
<tr>
<td>Complex electrophysiology</td>
</tr>
</tbody>
</table>
Markey Cancer Center (MCC)

UK HealthCare offers care for cancer patients through the nationally recognized UK Markey Cancer Center. The Markey Cancer Center is building upon existing research to promote multidisciplinary collaboration, enhance grant and research opportunities and provide Kentuckians with greater access to the latest clinical trials and cutting-edge care. Kentucky has the highest age-adjusted mortality rate for malignant neoplasms (cancer) in the country, 17 percent higher than the U.S. average, with particularly high incidence rates in colorectal and respiratory cancers. To address the critical issues of cancer among Kentuckians, UK HealthCare has focused on the development of care for cancer patients through the Markey Cancer Center, realizing many significant accomplishments over the last five years, including:

- Recruitment of a national cancer leader as the director of the Markey Care Center, Dr. B. Mark Evers. When Dr. Evers was recruited as the director of the Markey Cancer Center, more than 30 members of his research team and $14 million dollars in grant funding accompanied his move to the University of Kentucky.

- Establishment of the Markey Affiliate Network, including Rockcastle Regional, St. Claire, Harrison Memorial, Georgetown, Frankfort and ARH Regional Hazard hospitals. Markey supports the oncology programs at each affiliate hospital by offering training, consultation, continuing education, and assistance with planning local cancer prevention, early detection and screening activities.

- Recipient of GI Specialized Program of Research Excellence (SPORE) grant awarded by the National Cancer Institute – one of only six in the country.

- Development of an international model system for population-based cancer registries.

- Partnership with Shanghai First People’s Hospital Comprehensive Cancer Center, distinguishing MCC as a world-class treatment and research facility.
Strategic Initiatives

Regional Program Focus: Continue to provide strong interdisciplinary programs in the cancers that are most prevalent in Kentucky, such as gastrointestinal, prostate, breast, gynecological and lung. As part of the Markey Cancer Center, patients diagnosed with these diseases will have access to the latest research and clinical trials available in the region. Second, expand the Markey Cancer Center Affiliate Network focusing on enhancing the competencies of rural affiliate partners to care for patients with early-stage cancer and cancers requiring straightforward management. This affiliation network will continue to enhance cancer prevention, education and outreach to rural areas of Kentucky and create a continuum of cancer care with community providers. Overarching goals of the network will be refined and site-specific metrics will be established. Third, the multidisciplinary team approach to cancer treatment will be marketed with an emphasis on team collaboration, innovative multimodality treatment techniques, improved patient outcomes and preservations of quality of life.

Growth Strategy: The Markey Cancer Center will focus on solidifying its role as the leading cancer center in the region – beyond our market – with a broad range of expertise in basic and clinical research, as well as an array of clinical programs. Focus will be placed on programs in cancers that are the most challenging to treat and requiring multidisciplinary care, such as head and neck, brain, gynecological, leukemia/lymphoma and bone marrow transplantation. The MCC Affiliate Network will be expanded to providers outside the region with a focus on clinical collaboration. Achievement of National Cancer Institute (NCI) designation as a comprehensive cancer center will be a priority, enabling the center to increase cutting-edge research and attract the world’s best cancer researchers and physicians. Finally, the center will ensure the latest clinical trials are available to Markey cancer patients and patients of our affiliate hospitals.

Kentucky Children’s Hospital (KCH)
Children's hospitals are playing a growing role nationally, with a marked trend in...
pediatric inpatient care shifting from community hospitals to children’s hospitals. During the past five years, Kentucky Children’s Hospital (KCH) has continued to evolve into the regional leader for pediatric care. A summary of its accomplishments since 2004 are:

- Enhancement of advanced subspecialty care by significantly increasing the number of pediatric-trained faculty in subspecialty areas.
- Establishment of a KCH affiliate hospital network focused on training and educating community providers in the provision of pediatric care and optimizing care close to home for Kentucky’s children.
- Expansion of clinical outreach clinics focused on bringing advanced subspecialty care directly to communities throughout the Commonwealth at a level beyond that done by other children’s hospitals nationally.
  - Added eight Level II neonatal intensive care beds and eight Level III neonatal intensive care beds to continue to meet the needs of the Commonwealth’s tiniest and sickest babies.
  - Diversified ambulatory services resulting in significant visit growth.
  - Increased research funding and patient access to clinical trials, bringing the most current available treatments to our patients and fostering innovation.
  - Increased competitiveness of residency program and fellowship opportunities.
  - Enhanced relationships with community pediatric providers.

**Strategic Initiatives**

*Regional Program Focus:* Efforts will be made to enhance the patient and family

---

**Pediatric Volumes**

Kentucky Children’s Hospital accomplishments have resulted in increased demand for pediatric services, producing an almost 54 percent increase in pediatric discharges.
service experience by providing more child-friendly inpatient and outpatient facilities as well as centralizing and streamlining ambulatory patient flow to support improved customer service. The KCH Affiliation Network will be refined and expanded with a goal of keeping low-acuity care close to home and referring advanced subspecialty cases to KCH. Clinical outreach sites will be expanded to optimize patient access to subspecialists within local communities. The pediatric emergency department will be developed as a regional resource for community emergency departments.

• Continued focus on providing comprehensive subspecialty coverage:
  – Level III neonatal ICU
  – Level I trauma center
  – Pediatric ICU
  – Pediatric emergency department

• Provide ambulatory primary care with a focus on:
  – Needs of families of University of Kentucky employees
  – Teaching requirements of residency programs

_Growth Strategy:_ In addition to being the sole children’s hospital for the region, KCH will also focus on programs that will draw from a larger population base, including out-of-state patients. Examples of these programs will include development of a comprehensive end-stage renal disease program; initiation of a pediatric solid organ transplant program focusing initially on the kidney, but further evaluating the opportunity to provide heart, lung and liver transplants; further development of pediatric cardiovascular services into a nationally recognized pediatric heart center; continued statewide focus as a pediatric oncology referral center; and enhancement of the full complement of pediatric medical and surgical services.

**Solid Organ Transplantation**

UK HealthCare is only one of two centers in the state transplanting solid organs. The

### Destination Services

- Pediatric solid organ transplant
- Kentucky Children’s Heart Program
- Pediatric hematology/oncology
UK Transplant Center provides evaluation, listing, transplantation, and post-transplant care for heart, lung, kidney, liver, pancreas and kidney/pancreas transplants. A unique aspect of the UK program is the collaboration that is encouraged between UK transplant specialists and referring physicians. Among the program’s key accomplishments during the last five years are:

- The 3,000th patient milestone has been reached.
- A patient-tracking database, OTTR, has been implemented, enabling numerous paper-based tasks to become electronic. This system also includes a Web portal, which has enhanced communication with referring providers.
- Clinic patient flow was improved to enhance patient convenience, lab result turnaround time and operational effectiveness.
- An abdominal transplant program has been created with the help of nationally recognized surgeons and relies on the efforts of an integrated medical and surgical team. The first Organ Failure and Transplant Network has been established, enhancing communication, collaboration and continuity of care. A transplant outreach strategic plan has been employed and transplant volumes are rebounding.

With the establishment of a heart/lung transplantation program, the first Heartmate II ventricular assist device (VAD) has been implanted and we have been awarded advanced VAD certification by The Joint Commission. A heart and lung pre-transplant clinic has been established in the Ashland, Ky., area.

**Strategic Initiatives**

*Clinical Outreach:* In order to sustain a strong transplant program over time, a certain
level of transplants should be performed. In the table below, annual targets are listed by organ-site, which we will strive to reach over the next three to five years. A catchment size of the entire state of Kentucky (4.3 million people) will support kidney and liver transplant programs; however, that population is still insufficient to achieve volumes necessary to support heart and lung transplant programs.

<table>
<thead>
<tr>
<th>ORGAN</th>
<th>KENTUCKY INCIDENCE CY07/08 TRANSPLANTS PER MILLION KY RESIDENTS</th>
<th>ASPIRATIONAL VOLUME</th>
<th>POPULATION REQUIRED TO ACHIEVE ASPIRATIONAL VOLUME</th>
<th>POPULATION REQUIRED WITH 70% RETENTION RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIDNEY &amp; PANCREAS</td>
<td>42.5</td>
<td>110</td>
<td>2,600,000</td>
<td>3,700,000</td>
</tr>
<tr>
<td>LIVER</td>
<td>24.0</td>
<td>60</td>
<td>2,500,000</td>
<td>3,600,000</td>
</tr>
<tr>
<td>LUNG</td>
<td>7.2</td>
<td>25</td>
<td>3,500,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>HEART</td>
<td>6.2</td>
<td>25</td>
<td>4,000,000</td>
<td>5,700,000</td>
</tr>
</tbody>
</table>

Growth Strategy: As noted, UK HealthCare must expand its geographic footprint beyond the original UK HealthCare market (1.8 million people) boundaries to generate the patient volumes necessary for a superior program. Additional partnerships and outreach relationships will be sought to extend the transplant service area. These relationships will focus not only on the entire state of Kentucky but also in areas of bordering states. In addition to the transplant program, UK HealthCare is firmly committed to providing strong organ failure programs to support the patient's needs prior to transplantation. Collaboration with pediatric programs will be continued with the intention of building pediatric transplant program (starting with renal).

The abdominal transplantation program will continue outreach program development, improve medical team coverage, seek to become a research center of excellence, and develop a culture of education by offering conferences and continuing medical education (CME). The heart/lung transplantation program will focus on building a nationally recognized team; enlarging the VAD program, which could potentially result in more heart transplants; further developing the artificial lung program; partnering with end stage disease programs; and offering community provider education.
Maternal-Fetal Medicine & Neonatology

UK HealthCare is a regional leader in obstetric care, offering 24/7 medical support for high-risk obstetric patients and advanced subspecialty pediatrics for premature and acutely ill neonates. UK HealthCare’s strength stems from the maternal-fetal faculty who care for complex obstetric cases, including almost the full range of fetal surgery. UK HealthCare serves as a fellowship site to train additional maternal-fetal specialists.

Among the key accomplishments of the Maternal-Fetal Medicine program at UK HealthCare during the last five years are:

- Development of outreach programs, bringing care to high-risk obstetric patients in rural communities, including obstetric ultrasound and genetic screening programs.
- Increased maternal transfers to UK HealthCare for high-risk care and delivery to an all-time high of 400, up 25 percent.
- Ultrasound services received the highest level of accreditation by the American Institute of Ultrasound in Medicine (AIUM).
- Increased Neonatal ICU capacity by 16 beds.
- Certification by the American Board of Obstetrics and Gynecology of the fellowship program to train obstetricians to become maternal-fetal specialists to care for high-risk obstetric patients.
- Increased external grant funding for research addressing issues such as prematurity, prenatal substance abuse, and gestational diabetes.
- At the request of communities, placement of UK obstetricians in rural areas that have lost their obstetricians due to the growing malpractice crisis. These community-based physicians spend almost full-time in their community practices, are supported clinically and administratively by UK HealthCare, and have the opportunity to regularly return to campus for education and interaction with other faculty.

The Neonatal ICU has experienced a 17.2 percent increase in discharges since FY04.
Strategic Initiatives

Regional Program Focus: With the significant level of premature births in the state, UK HealthCare will continue to focus on providing the most advanced levels of obstetrical and maternal-fetal medicine care. The program’s relationship with the state Department for Health Services will be leveraged and it will continue to work with community providers to ensure the appropriate level of obstetrical care is available in rural communities. This may take the form of community-based UK obstetrics programs established in underserved areas, maternal-fetal medicine clinical outreach, and the provision of education, evidence-based guidelines or best practices and consultative services to family practitioners, nurse practitioners and personnel in rural hospitals to improve their competencies to care for patients in their communities. Ultrasound technicians and equipment will be deployed to rural communities using telemedicine to send ultrasound images taken in rural areas back to UK physician specialists.

With this increased level of outreach, UK HealthCare will pursue relationships with referral centers partnering in collaborative, multi-site research, positioning UK HealthCare to apply in 2015 to be one of about 15 centers in the National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Plans call for development of a virtual fetal care center to coordinate UK high-risk obstetric specialists with the highly specialized pediatric/fetal expertise at the Kentucky Children’s Hospital. A plan will also be created for management and/or staffing of community-based neonatal ICUs as requested, while the well-regarded existing neonatal transport will be further optimized.

Perinatal research will remain on the forefront, focusing on conditions commonly found in Kentucky such as diabetes, prematurity, substance abuse and obesity. Finally, a regional network of hospitals will be created partnering in best practices for clinical care, continuing education and research.

Maternal-Fetal Medicine outreach programs

- Ultrasound
- High-risk obstetrics
- Telemedicine

Community-based obstetrics

- Level II/III Neonatal ICU
- Neonatal transport
- Collaboration with Kentucky Children’s Hospital subspecialists
UK Level I Trauma Center

Injury is the most common cause of death among Kentuckians under age 45. UK HealthCare has been integrally involved in the development of the Kentucky Trauma Care System, a statewide program enacted by the Kentucky legislature in 2008. Three Level I trauma centers serve the state – two of them are located at UK thanks to verification by the American College of Surgeons for both adult and pediatric trauma services. In addition, new trauma centers, Levels II-IV, will be created. Fifteen hospitals in 14 Kentucky counties are in the process of seeking verification. The statewide system will create protocols for treatment and transport to the appropriate level trauma center, as well as establishing educational requirements for all providers and a trauma database with improved reporting. The goal of the massive effort is to reduce death and disability rates in Kentucky.

Among the key accomplishments of the UK Level I Trauma Center during the last five years are:

- The highest level of trauma service provided to Central and Eastern Kentucky.
- The only center in the state verified Level I for treatment of pediatric trauma, making UK one of only eight centers nationwide to be verified in both adult and pediatric trauma.
- The center has produced excellent outcomes, with patient mortality 33 percent less than might be expected.
- Staffing of the center has benefited from faculty recruitment efforts and includes trauma registrars as well as a professional drug and alcohol counselor.
- The center collaborates on the hosting of a statewide trauma symposium with the University of Louisville and chairs the Kentucky Trauma Advisory Committee. Trauma personnel play a key role in the efforts around regional Emergency Medical Services collaboration.
- Basic and clinical research is conducted within the center and results are disseminated widely.

The trauma program has experienced a 38 percent increase in adult discharges since FY04.
• The center is responsible for the development and coordination of the following educational efforts that benefit providers throughout the state: advanced trauma life support (ATLS), trauma nurse core course (TNCC), emergency nurse pediatric course (ENPC) and rural trauma team development course.

Strategic Initiatives

Regional Program Focus: The multiple specialties that currently participate in the trauma program will be integrated into a single service line. This should improve efficiencies and contribute to optimal patient care. Quality measures will be broadened to include functional outcomes. The program will support community hospitals in achieving trauma verification and Emergency Medical Services protocol development. A successful outreach program utilizing physician liaisons will be continued to improve communication between the UK Level I Trauma Center and referring emergency departments. The service will also continue its support of organ donation and will continue to provide acute general surgery.

Multispecialty trauma care
  • Critical care
  • General surgery
  • Orthopaedic surgery
  • Neurosurgery
  • Plastic surgery/Burn
  • Maxillofacial surgery
  • Thoracic surgery
  • Vascular surgery
  • Pediatric surgery

Trauma system leadership
  • Injury prevention
  • Trauma education

This map illustrates the emerging Kentucky Trauma Care system – 15 hospitals in 14 counties are in the process of seeking verification as Level II-IV trauma centers.
Outreach and Development of More Integrated Delivery of Care

UK HealthCare has bolstered its linkages and relationships with community providers over the last five years, further enhancing its ability to develop a more integrated system of care. Requests from community providers and local needs guide UK HealthCare in formulating outreach opportunities. As UK HealthCare has earned trust and goodwill during its initial outreach activities, partners have become interested in working with us in multiple areas.

**Accomplishments**

UK HealthCare has increased outreach clinical services over the last five years – services are now offered in more than 150 off-campus clinics in 41 clinical areas with sites in more than half of the 63 counties in our market. Not only has the number of clinics increased, but outreach programs are now better supervised and organized to meet the needs of community physicians. This enhanced outreach has lead to major growth and UK HealthCare now has linkages to facilities with approximately 4,500 beds.

In addition to outreach clinics, provider affiliate networks have been established in cancer, children’s services, stroke and organ failure. The affiliate network approach began in March 2006 with three hospitals (Harrison Memorial, Rockcastle Regional and St. Claire) participating in the Markey Affiliate Network, and now there are 19 affiliates in four networks. Among the services offered by UK HealthCare to network affiliates are:

- Johnson
- Pulaski
- Rockcastle
- Perry
- Madison
- Rowan
- Scott
- Harrison
- Franklin
- Fayette

UK HealthCare’s main medical campus, Lexington

ARH Cancer Center, Hazard

Frankfort Regional Medical Center, Frankfort

The seven community hospitals pictured have UK HealthCare affiliations. Forty-one UK specialties hold clinics in 150 outreach locations. The 40 counties where UK HealthCare has a presence are shaded yellow.
• Medical direction
• Medical and nurse training, including standards and protocols
• Guidance in planning community screenings and programs
• Regular quality review
• Opportunities for patients to enroll in clinical trials

An online physician portal has been developed to allow community physicians to view their patients' UK Healthcare medical records from their office computers. To date, UK Healthcare has provided training and security clearance to more than 530 community physicians to enable them to use the physician portal.

A physician liaison program was established in 2005 and is dedicated to identifying and meeting community physician needs and maintaining an effective line of communication. Continuing medical education (CME) has been expanded and is focused on meeting community physician needs. Liaisons take CME programs out to physicians in the community. UK Healthcare continuing education for physicians, physician assistants, advanced practice nurses and pharmacists in Kentucky not affiliated with UK has grown exponentially from only 115 new registrants in 2004 to 2,300 new registrants in 2009 for a cumulative total of more than 9,000 new registrants of Kentuckian clinicians since 2004.

UK HealthCare has supported communities in meeting their need for physicians to practice locally by helping with physician recruitment and sponsoring physicians to establish practices in rural areas. UK HealthCare currently has two community-based obstetrical practices established in rural communities where the population was significantly underserved. UK serves as a telemedicine hub for the Commonwealth and has expanded the use of telemedicine since 2004. UK telemedicine has been used for 15,000 clinical visits since 2004, linking the physician specialists at UK with clinicians and their patients throughout our market, including industrial medicine for mining and rural health clinics. UK telemedicine also supports bringing medical information and education to clinicians throughout Kentucky, offering 700 programs annually including a lecture series, monthly clinical conferences and grand rounds.

UK HealthCare has leveraged its size and purchasing power to reduce administrative costs at smaller hospitals.

UK HealthCare offers a physician-to-physician referral and consult service throughout the state. This service provides a “one call” solution to link community providers with the advanced subspecialty faculty at UK for consultation and referral, providing access to UK advanced subspecialties on a 24/7 basis. The service has demonstrated a substantial 75 percent growth in call volume from community clinicians 2004 to 2009.
Regional strategy

Development of highly integrated systems among key providers is the best option to address the changing health care environment.

- Most hospitals in UK HealthCare’s market are small and independent with limited resources to address declining reimbursement and changing incentives.
- Rural hospitals are already dependent upon UK HealthCare to care for their complex patients. Each month an average of 650 hospital-to-hospital transfers occur.
- Rural areas are experiencing a scarcity of subspecialists and other clinical staff.
- Information technology allows providers to share patient information, protocols and to organize around making the right decisions at the right place at the right time.
- UK HealthCare requires a broad geographic area to provide the population needed to support high-acuity, cost-effective advanced subspecialty services. A system approach would expand the geographic reach to enhance access to appropriate volumes of these patients.

Potential for system integration

UK HealthCare has the critical components of a system already:

- UK Chandler Hospital – equipped to treat complex patients
- UK Good Samaritan Hospital – a cost-effective setting for less acute patients
- Multidisciplinary group of 800 physicians connected through joint planning, management and information technology
- Expanding outpatient access and capacity
- Experience developing linkages, networks and outreach initiatives because of a commitment to support regional providers
- Must define, understand and set a timeline for system development
Future strategies

Looking forward, we must move beyond a network and develop a health care delivery system. Although the attributes of a system are unclear, it is built on the premise of increased coordination of care. A system takes care of patients in the appropriate setting right from the beginning. Lower acuity patients are taken care of in their local community; higher acuity patients come to our academic medical center when severity requires that expertise and justifies a higher cost structure. As UK HealthCare moves forward in developing partnerships with community providers, we will:

- Continue to analyze Kentucky to identify other facilities that are candidates for broad-based relationships.
- Identify appropriate partners for affiliate networks and develop a maturation strategy for each of these in order to enhance these relationships.
- Establish additional affiliate networks around the Gill Heart Institute and Emergency Medicine.
- Enhance the competencies of community hospitals and physicians to provide more high quality care in their communities.
- Work hand-in-hand with the local community physicians to coordinate patient care and provide a smooth transition from the community provider to UK and back again.
- Develop a comprehensive approach to ensuring quality, safety and service.
- Ensure a mutually beneficial relationship; our partners must achieve some tangible benefit for their relationship with us — this may mean sharing our brand and image.
- Explore additional integration approaches with affiliate facilities that will hardwire relationships, including joint strategic planning, increased co-branding, conjoint marketing, conjoint approaches to information systems, administrative support for functions such as billing and collections, etc.
- Share information and responsibility among all providers, community as well as academic, to accomplish value.

Affiliation strategies for facilities will depend on distance, size of the facility and types of patients. In areas closest to Lexington, we will offer a broader array of services. Farther away, we will become more focused regarding the services offered, refining what we offer based on the area’s need and capabilities of other providers serving the area. At the full extent of our reach, our outreach will be narrow in focus and confined to advanced subspecialty services not currently available to residents of the area.
The Lexington campus will serve as the ultimate destination point of the system for the most complex patients, with a particular focus on services not available at other providers in the region. Linkage and communication through information technology and telemedicine will be key to integrating the various sites. Critical success factors to partnership development include:

- Aligned incentives and goals
- Mutual understanding and trust
- Connectivity and communication – virtual connections rather than locations will provide structure to the system
- Shared protocols, procedures and management tools
- Shared “risk and reward” and payer contracting
- Integration with a full continuum of providers covering all aspects of care – including preventive, physician, hospital and post-acute care – demonstrating strong outcomes at reasonable costs for the entire course of illness or population served (or whatever the payer deems as appropriate to be measured)

UK HealthCare is already ahead of the curve in system development. Many key elements are already in place. We are being viewed as a leader in system development among academic medical centers, with other organizations seeking out UK HealthCare for guidance. As UK HealthCare develops a health care system approach, we may be the central focus for organizing health care in much of Kentucky. UK may become a leader in advocacy and state policy development in select areas.

In evaluating UK HealthCare’s position at this point in time, two fundamental insights have become clear:

- Our business is about mutually beneficial relationships.
- We are perceived as UK HealthCare – not independent programs or departments.

Outreach Takes on New Aspects

UK HealthCare will expand its natural geographic footprint to achieve the referrals needed. For example, we will identify nephrologists who cover large dialysis programs and refer multiple patients for transplant, as well as cardiology groups that see significant numbers of heart failure patients and refer multiple patients for transplant. To build adequate referral bases, we will have to cross state lines.
UK HealthCare is well poised to respond to any changes in the market and to provide the leadership to improve our systems of care. In order for UK HealthCare to improve quality, improve its ability to coordinate care with community partners, and improve flexibility as patients move between inpatient and outpatient care, changes were needed in the system’s management structure. In 2009, clinical operations in the hospital and in the clinics was placed under a chief clinical officer whose direct reports include chief administrative officers for both hospitals and the entire network of ambulatory services, as well as a chief medical officer and a chief nursing executive supportive of collaborative partnerships between nurses and physicians and dedicated to collective accountability for clinical care processes and outcomes.

The tenets that guide our operations are three-fold:

1) The most efficient systems produce the best outcomes in terms of quality, safety, service, clinical outcomes and costs.

2) The needs of the patient come first.

3) Great service is a function of engaged employees.

Ensuring high quality care and patient safety

As a nation, it is imperative we improve the quality and efficiency of our health care system. The unique structure of UK HealthCare as an integrated clinical enterprise allows us to redesign our systems of care to create the highest quality and safest environment for our patients. Producing the best outcomes for our patients requires the participation and integration of professionals from multiple disciplines – it is a “team” sport.
Structure and techniques employed

- **Evaluate quality and patient safety** - In 2006 UK HealthCare created the Center for Enterprise Quality and Safety (CEQS) to manage and support patient safety and quality initiatives by providing expertise in identifying, implementing and measuring improvement processes. The CEQS serves as the catalyst to support and encourage every member of our health care team to explore new ways to improve our quality and efficiency, which puts UK HealthCare at the vanguard of operational quality and safety. The host of ideas and the myriad of initiatives is proof of the organization’s commitment to continuous improvement.

- **Use of “Swarms”** - SWARMS is a quality improvement process that brings together involved staff to dissect a problem immediately with a focus on systems improvement. This approach highlights the critical interconnected nature of all elements in the care system. As a result, caregivers are forced to look at the whole process – an approach more likely to produce meaningful, lasting improvements in the continuum of care. The practice of SWARMS has encouraged the development of UK HealthCare as a “learning organization.”

- **Mortality reviews** - UK HealthCare systematically and continuously reviews each death that may occur under its care. This allows the entire team to review the clinical outcomes and any system issues that may be evident. The immediate feedback ensures we are vigilant in providing the highest quality and safest care.

- **Power of collaboration** - UK HealthCare actively participates in a number of national consortiums of academic medical centers such as the University HealthSystem Consortium (UHC). This allows us to learn from other academic medical centers across the nation and together help establish “best practices” in patient care. The rich database allows us to benchmark our performance compared to other academic medical centers also focused on the provision of advanced specialty care.

Outcomes and initiatives

- **Improving the processes of care** - Over the past five years we have implemented a series of large and small changes to improve the quality and safety of care. Examples include:

  - **Standardization** – While some element of a patient’s care must be personalized, a large portion needs to be standardized to ensure that every patient has the benefit of the best evidence-based standard of care.

  - **Checklists** - Checklists have been incorporated into patient care routines to ensure caregivers remain focused on quality.

  - **Computer-based provider order entry (CPOE) implemented** – CPOE enables a patient’s care provider to enter an order for a medication, test or procedure directly into the computer. The system then transmits the order to the appropriate department or individuals, so it can be carried out. UK HealthCare’s CPOE system includes the most advanced versions of such systems and includes real-time clinical decision support such as dosage and alternative medication suggestions, duplicate therapy warnings and drug-drug/drug-allergy interaction checking.
- **Computer guidelines** – The UK HealthCare electronic record allows us to implement guidelines to ensure every patient is receiving the therapies proven to produce the best outcomes.

- **Specimen labeling** – A new approach to labeling of specimens for testing has virtually eliminated labeling errors and improved the speed and accuracy of laboratory service.

- **Core measures** – Medicare has developed a series of widely accepted quality measures that are publically reported for each hospital. Administrative and clinical leaders have worked continually to improve our performance and adherence to these standards (see Overall Core Measure Performance graph).

- **Infection control** – The emergence of organisms highly resistant to multiple antibiotics is quickly becoming a national epidemic. UK HealthCare has been at the forefront of trying to curb this problem.

- **Hand hygiene** – Good hand hygiene is the cornerstone of any effective infection control program. However, busy health care workers occasionally forget to properly wash their hands. UK HealthCare has implemented a number of interventions, including formal sanctions of physicians who fail to comply with this simple yet critical activity. Compliance has improved and the rate of hospital-acquired infections has declined (see hand hygiene graph on next page).

- **Central line infections** – Catheters placed into large veins (central lines) are often needed in the care of very sick patients. However these central lines are more prone to infection. UK HealthCare has standardized the insertion and maintenance of these central lines, thus dramatically reducing the rate of infection. In 2009-2010, the Neurosurgical Intensive Care Unit went more than one year without a single infection (see central line infections graph).

- **Ventilator-associated pneumonia** – By introducing a standard “bundle” in the care of patients requiring mechanical ventilation, we have been able to significantly reduce the rate of ventilator-associated pneumonia (see ventilator-associated pneumonia graph).

- **Rapid response team** – A rapid response team is continuously available at both Chandler and Good Samaritan hospitals to any provider or family member who wants a second opinion about a patient. As a result, fewer patients developed serious medical problems when leaving the intensive care units or being discharged.
Future priorities

All of our efforts to improve patient safety and the quality of care provided within the UK HealthCare system derive from our commitment to the Commonwealth and our referring partners. We take very seriously our duty to provide tertiary and quaternary care to the citizens of Kentucky at large. In pursuing our commitment to quality, we will focus on system efficiency because we believe the most efficient systems produce the best outcomes. Our future strategies for improving patient safety and quality of care include:

• Seek Top 20 status in patient safety and quality among peer academic medical centers.

• Improve the outcomes and quality of clinical services by continuing to improve core measures, focusing on key areas, reducing hospital-acquired and highly resistant infections, reducing hospital falls and improving risk-adjusted hospital mortality index.

• Creation of nurse sensitive quality indicators, 14 items related to the quality of nursing care considered nonnegotiable at UK HealthCare.

Providing the most efficient care

In the first five years, UK HealthCare created a new structural model: the clinical enterprise. Management of the new model now becomes our challenge. In this section we address efficiency, which in the health care setting includes the elimination of unnecessary variation (standardization), the elimination of non-value-added activities (waste reduction) and the effective integration of services and activities (teamwork). Efficient settings also make the best learning environments.

Approaches to improve our operations

• Process improvement - UK HealthCare has adopted “lean” techniques found in manufacturing and introduced them to the health care environment. Through this lens, we’ve been able to reduce waste, mistakes, variation and work imbalance; save time; and improve the patient experience.

• Training – UK HealthCare has provided its physicians and staff with a variety of educational programs to help address real-time issues related to the systems of care. This includes workshops and programs on process improvement and the “lean” techniques. More than 1,100 people have received this training. In 2008 UK HealthCare partnered with the UK Gatton College of Business & Economics to develop an Executive Leadership Academy – a one-year training program to develop our up-and-coming leaders.

A concerted effort to improve hand hygiene compliance among physicians has shown good results.
• **Management teams** - UK HealthCare's leadership model is evolving to a triad leadership model that engages all members of the team, provides clear ownership and accountability for clinical, service and efficiency outcomes, and recognizes the critical nature of partnerships – nurse, physician and administrative lead. In addition, we have created senior executive management teams with the ability to implement needed changes in an efficient manner, such as our OR Executive Committee and our Kentucky Children's Hospital Executive Management Team.

• **Capacity management** – In 2005, a Capacity Command Center was established to optimize patient throughput and provide clinicians with a tool to facilitate prompt, expeditious, efficient and safe transfer of patients to the appropriate venue of care. The center is responsible for managing the capacity constraints that involve human, capital, intellectual or other resources. It also organizes and coordinates smooth and efficient flow of patients into and out of the clinical enterprise.

• **Access center** – In 2009, the Patient Access Center was established to facilitate appointment scheduling and patient preregistration for ambulatory services. This initiative is a first step in an overall redesign of patient access to our clinical services to facilitate care, improve patient satisfaction and support our referring physicians.

• **Use of comparative benchmarks** – UK HealthCare participates in a number of national organizations such as the University HealthSystem Consortium (UHC) and the Council of Teaching Hospitals and Health Systems (COTH) that collect data regarding costs and other measures of operational efficiency in a systematic fashion. This data enables us to compare our performance relative to our academic medical center peers.

**Operational efficiencies accomplishments**

• **Managing our capacity** - Thanks to many of our 2004 strategies, UK HealthCare faced escalating patient volumes and high occupancy rates at UK Chandler Hospital. As a result, we needed to identify additional resources to accommodate the number of referrals we were receiving from around the state. One response was our purchase of Samaritan Hospital in 2007, now named UK Good Samaritan Hospital. This gave UK HealthCare the flexibility to direct less-acute patients to Good Samaritan while freeing much-needed bed space at UK Chandler Hospital for severely ill patients requiring tertiary-level care. As a result, we were able to continue to grow our patient volume in 2008 by 20 percent when previously we had been at capacity.

• **Operating room redesign** - In 2004, a multidisciplinary effort was initiated to improve the operational performance of perioperative services at UK HealthCare. We redesigned our OR operations, recapturing existing capacity to accommodate our growth. As a result, surgery cancellations have been substantially reduced, as have first-case delays, while we have increased preoperative evaluations and reduced OR turnover times. Our management team is data driven and focused on achieving superior outcomes and maximizing the use of all three of our OR sites (Chandler Main OR, Center for Advanced Surgery and Good Samaritan Hospital).

• **Intensive care unit efficiency** – The demand for patients requesting ICU care frequently exceeded our capacity at UK HealthCare. In any given month we were not able to accommodate at least 40 patients requiring this level of care.
In 2009, the ICU team implemented several interventions designed to reduce the rate of infection and the average length of stay. During the first six months, the rate of catheter-related infection fell by more than 50 percent and our length of stay in the ICUs declined by 1.3 days.

- **Measures of efficiency** – UK HealthCare has been a consistent top performer relative to other academic medical centers that provide advanced medical services. The case mix index (a measure of severity) exceeds the 75th percentile. Our average expense adjusted for this high case mix index consistently ranks in the lower 35th percentile. Our overall CMI adjusted length of stay each quarter typically rates below the 25th percentile relative to our peers. Our structure and approach has allowed UK HealthCare to be a national leader in health care operational efficiency.

The 11-bed Clinical Decision Unit (CDU) was opened to act as a buffer against system ebbs and flows at UK Chandler Hospital. The CDU receives patient transfers and determines the level of care the patient requires, which keeps these patients out of the emergency department and ensures transfers are assessed and then placed in the most appropriate patient care unit. The CDU staff is uniquely qualified to handle all levels of care – ICU, telemetry, acute or outpatient post-procedure observation – because it serves as a “catch-all” solution to manage capacity across the system.
Future strategies in operational efficiency

Today’s difficult economic environment has increased UK HealthCare’s need to emphasize efficiency. In addition to improvements in the system, we must set aggressive targets for cost containment and we must meet or exceed these targets.

• **Continue development of an integrated system of care** – Operational systems to expedite and coordinate care across the continuum: from outpatient, to inpatient, to care at a distance must be defined and achieved. We must move beyond our focus on inpatient care.

• **Further integrate corporate support functions** – We must refine the function of the senior management operations group to optimize the use of our resources.

• **Increase the effectiveness of UK HealthCare managers** – Our objective has been to empower managers to act and provide them with the needed tools.

• **Increase employee engagement** – We will continue efforts to create an environment of respect and acknowledge individual contributions and successes.

• **Continue to grow the size and impact of clinical services** – We must provide the needed facilities, infrastructure and programs to allow the continued growth of our unique specialized services.

• **Maintain a competitive length of stay (LOS)**

• **Maintain and improve our competitive cost-per-discharge**

• **Leverage our IT resource to improve our efficiencies**

• **Set and monitor signature performance metrics** – Continue to monitor efficiency, growth, service excellence and quality/safety performance measurements across the system and use these measures to remain focused and accountable.

• **Support system growth**

Unrecouped costs climb when average length of stay goes up. This graph, adjusted for the high case mix index, illustrates UK Chandler Hospital has been able to manage length of stay.
Attending to the needs of our patients and families

Despite the marvels of all of the complex technology, in the final analysis, health care is a very human endeavor. Our patients and their families deserve to be treated with kindness and respect. We need to be certain we attend to their personal and emotional needs, especially during time of great stress.

In the previous section, we referred to tenets that guide our operations. Among these is: “Great service is a function of engaged employees.” Every UK HealthCare employee can expect respect, tools and support to do their job and acknowledgement. Our approach to service excellence starts with how we treat our employees, who are truly our human capital.

Our approach to improve service to our patients

- **Patient satisfaction surveys** – UK HealthCare has invested time and resources to gain the patient’s perspective on the service received while in our care. Through the use of a nationally recognized patient satisfaction survey, patient input is sought post-hospitalization and after physician office appointments. The results of these surveys are analyzed and drive process improvement initiatives.

- **Employee engagement** – In 2009, UK HealthCare conducted a “full census” survey of our team members across the continuum of care. Almost 75 percent of our employees responded with thoughtful ideas about how we can improve our service to each other and ultimately the patient. Out of this effort has risen the employee pact: “Respect, tools to do your work, and recognition for a job well done.”

- **Office of Service Excellence** – In November 2009, as a further commitment to being a service-focused organization, we created the Office of Service Excellence. The office is charged with:
  - Customer relations
  - Service assessment and data analysis
  - Employee partnership and development in collaboration with University of Kentucky Human Resources
  - Serving as the central clearinghouse for service initiatives across the UK HealthCare enterprise

Service excellence accomplishments

- **Improved patient satisfaction** – Various clinical teams have implemented countless measures to better meet the needs of our patients and their families. One of the most notable service improvement initiatives can be seen in the UK Chandler Emergency Department. Through a collaborative effort of physician, nursing and patient access leadership working with front-line staff members, patient satisfaction in our Level I Trauma Center and Emergency Department has risen to one of the highest in the national database (see Chandler ED – Overall Rating of Care graph).
• **Patient and family guides** – Through collaboration among team members across the UK HealthCare enterprise, booklets intended to assist the patient and family to navigate our highly specialized environment have been developed.

• **Volunteer services** - Joining the customer service team in 2007, the volunteer services division has tripled the number of volunteers serving our patients, families and UK HealthCare team members. Our volunteers provide invaluable service to our patients such as helping them navigate the campus complex, serving as way-finding assistants and providing comfort measures in our waiting rooms.

• **Communicating caring behaviors** - Since 2008, thousands of UK HealthCare employees have attended workshops focused on patient-centered communication and work practices. As a result of this focus, we are hardwiring behaviors that ensure we communicate caring in every interaction with every patient, every time they seek our care.

**Future strategies in service excellence**

Our goal is to be recognized locally and nationally as the health care provider of choice by providing superior service to all of our customers – the patient and their families, the referring physicians, the community and each other. UK HealthCare intends to be the workplace of choice for Kentuckians. Some of our strategies include:

• **Inpatient service focused initiative** - Nursing leadership, in collaboration with their physician partners, have committed to improving the patient and family experience by measuring, monitoring and reporting leading indicators of service-focused behaviors.

• **Discharge call-backs** - UK HealthCare patients will be called to ensure they have been able to follow their post-discharge plan of care.

• **Caregiver identification initiative** - Strategies will be implemented that help patients identify the various members of their care team, such as standardizing the uniform for the UK HealthCare nursing staff.

• **Customer relations** - A culture of caring and service will remain the focus of our customer relations team. These highly trained individuals serve as facilitators of communication and process improvement initiatives.

• **Employee engagement** - As we work toward becoming a workplace of choice, an opportunity to improve communication from the senior leadership team to frontline team members will be a top priority. Strategies to increase employee input and engagement will continue to evolve.

Our goal is to be recognized locally and nationally as the health care provider of choice.
Gaining local and national attention

In October 2007, UK HealthCare was named a “Rising Star” by the University HealthSystem Consortium for “significant improvements in the quality of care.” Other accomplishments include:

- Recertification in 2005 of UK Chandler Hospital and certification of Kentucky Children’s Hospital as nursing Magnet® hospitals by the American Nurses Credentialing Center.

- In 2006, UK HealthCare was ranked nationally as a “Performance Improvement Leader” by the Thomson/Reuters organization. UK HealthCare has been recognized twice in Thomson Reuters’ Top Hospitals®: Benchmarks for Success ranking.

- Providing the highest level of care for the following:
  - Level I trauma center (adult and pediatric verification)
  - Level III neonatal intensive care
  - Ventricular assist device (VAD) advanced certification
  - Anthem Blue Distinction Center for Rare and Complex Cancers
  - Primary stroke center

UK HealthCare Marketing has used the past five-year planning period to build the infrastructure and programs to support the organization’s strategies and achieve success in our marketplace. Marketing’s goal has been to give the organization’s primary customers (consumer/patients, referring physicians/community hospitals, and UK employees) more reasons to use UK HealthCare more often by increasing understanding of services offered. The result has been a steady flow of appropriate patients to support clinical programs, research and education.
Strategic Marketing

Specifically, marketing has focused on supporting the positioning of UK HealthCare as a major referral center. This was accomplished by 1) building awareness; 2) increasing dialogue between UK HealthCare and its publics; 3) inviting new customers to try UK HealthCare; and 4) developing loyalty to UK HealthCare.

Accomplishments

In the last five years, UK HealthCare has become positioned as the place to go for the most advanced care and as Kentucky’s health information resource.

For the past planning period, Marketing has focused on three primary objectives: 1) growing advanced subspecialty volume; 2) building stronger relations; and 3) enhancing organizational image.

Growing selected volume

Since 2004, requests from community providers to transfer patients to UK HealthCare have increased from 7,555 to 15,703 in 2009, and the number of referring physicians has grown from 1,190 in 2004 to 4,316 in 2009.

Building stronger relationships

The physician liaison program has worked hard to personally meet virtually all community physicians in Kentucky and have introduced many of them to our faculty via continuing medical education, dinner meetings, office visits, grand rounds, medical meetings, seminars and lectures. The number of unique physicians referring to UK has increased 362 percent.

In addition, Marketing has worked with many of our partner community hospitals to increase awareness of UK doctors providing specialty care at their community hospital. Survey research shows that when UK HealthCare collaborates with a community hospital partner, consumers view it extremely positively and are more likely to use both organizations in the future for medical care.

UK HealthCare has also developed a following of more than 45,000 consumers who receive regular information via UK House Calls, Advances & Insights and HealthSmart!. In addition, UK HealthCare’s website and consumer phone line, UK Health Connection, have both experienced steady increases in users (see consumer engagement graph on next page).

Improvements in organizational image

In building the organization’s image, Marketing supported the improvement of the patient and/or referring physician experience and communicated the many advancements, new services, customer services and health information available. A variety of patient guides and material for referring physicians have been developed to make UK HealthCare easier to use.
Over the past five years the number of UK doctors recognized by America’s Best Doctors® has risen from 64 to 123. Not surprisingly, the percentage of Bluegrass consumers who believe UK HealthCare has the best doctors has risen from 15 to 31 percent. Perhaps the best gauge of organizational image is the percentage of new patients choosing UK whose family member, friend or co-worker influenced them to come.

**Future strategies**

Marketing will continue to support volume increases, build relationships, grow the organization’s image, and support system development and marketing of destination services. Marketing initiatives will include:

- Expansion of joint programs between UK and partner organizations, including physician groups and hospitals in Kentucky, West Virginia, Tennessee and beyond. The organization’s marketing will evolve as these relationships become more structured.

- Continuation of an expanded effort into social media and similar avenues to drive word-of-mouth referrals. UK HealthCare is already very active with a major presence on Facebook, YouTube, Twitter and a number of blogs and forums.

- Expansion and improvement of the physician portal as a way to work more closely with community physicians to provide faster, better communication about a patient to increase the continuity, quality and management of a patient’s medical care.

- A medical guide for the public to help consumers understand what’s available to them at UK.

- UK•MDs and UK Health Connection, the physician and consumer phone lines, will continue to grow to serve the needs of physician-to-physician and consumer calls.

- Communication to current and prospective patients about the new pavilion at UK Chandler Hospital. Visitors will become a priority, starting with the new pediatric and adult emergency department, the new pavilion in 2011, and the movement of current hospital units to the new facility over the next several years.

- Expansion of disease and injury prevention campaigns related to secondhand smoke and horse rider safety. These campaigns offer an opportunity for collaboration with rural hospitals participating in one or more of UK HealthCare’s affiliate networks.

In 2004, a facility assessment was completed on the medical center campus. It was determined that both the main patient hospital facility and the medical and dental school buildings have severe functional limitations and will need to be replaced. As a result of this assessment, UK HealthCare embarked on a detailed master facility planning process focused on defining the zones of the campus, identifying tactical short-term facility improvements, and defining the scope and phasing of a new patient care facility. With the assistance of a world-renown design team, a hospital facility was designed that will provide a state-of-the-art healing environment for the people of Kentucky.
Accomplishments

During the past five years, UK HealthCare has been focused on building a hospital that will meet both present and future needs, as well as enhancing the facilities and technology of today. With the opening of the new facility for UK Chandler Hospital and the acquisition of Good Samaritan, UK HealthCare clinical facilities have grown from 1.5 million square feet to 2.6 million square feet – an increase of 73 percent. Below is a list of highlights accomplished during the past five years:

• **Good Samaritan Hospital**: In order to meet volume demands, UK HealthCare acquired Samaritan Hospital in 2007. This acquisition included 338,000 square feet of hospital space, followed by significant renovations including build-out of a new 15-bed ICU and 12-bed telemetry unit and renovation of the psychiatric unit and emergency department. In addition to space renovations, significant upgrades in imaging technology and operating room equipment and capabilities have also occurred.

• **Chandler Hospital**: Significant enhancements have been made on the Chandler campus including:
  - Markey Cancer Center renovations (see page 23) and creation of a new Radiation Medicine Clinic; significant expansion of the chemotherapy infusion program
  - Establishment of the 5,200-square-foot Gill Imaging Center providing the latest in MRI and CT imaging technology (see page 20)
  - Expansion of the neonatal ICU by adding eight Level II beds and eight Level III beds (see page 24)
  - Chandler Emergency Department expansion and renovation

• **Ambulatory Services**: A significant amount of focus has been placed on ambulatory services.
  - With the acquisition of Good Samaritan, UK HealthCare was able to increase its ambulatory facilities by 70,000 square feet. After taking ownership, various clinics have been refurbished; clinics from the Chandler campus and the Richmond Road area have relocated; and a cardiopulmonary rehab clinic was established.
  - On the Chandler campus, the neurology and neurosurgery programs were consolidated into a new Kentucky Neuroscience Institute; the Internal Medicine Clinic relocated to the new University Health Services building; and planning efforts to redesign and expand the Ophthalmology Clinic and consolidate pediatric services within the same general area of Kentucky Clinic are under way.
At our off-campus sites, UK HealthCare acquired the Kentucky Sports Medicine Clinic on Perimeter Road in 2009 and merged its existing sports medicine practice at this location; our Leestown Family Medicine practice was consolidated into UK HealthCare's family medicine practice; and we acquired the Family Care Center Clinic on Red Mile Road (renamed the UK Polk-Dalton Family Care Center).

- **Patient Care Facility**: The new facility is evidence of a commitment by UK HealthCare to serve the citizens of Kentucky with the highest level of care. The patient care facility project has remained on budget and on-time. This new facility will house 1.2 million square feet of the most advanced health care space seen anywhere in the United States.

The first step in the process was to clear the building site for the new facility. In order to do this, a new garage was built on South Limestone across from the hospital. The new garage offers 1,600 parking spaces and is three times the size of the previous garage. In 2009, more than 1.3 million patients and visitors have been transported from the garage to various locations on the Chandler campus.

### Future strategies

The next five-year period will be a critical time for facility management at UK HealthCare. In addition to the routine upgrade and maintenance of UK HealthCare facilities, major focus will be placed on the build-out of the patient care facility and continued enhancement of ambulatory services. Facility planning will continue to focus on advancement of service capabilities by upgrading facilities to support new medical technology. Emphasis will also be placed on ensuring operational efficiency through our design and development of facilities. Specific plans are outlined below:

- **Good Samaritan Hospital**: As UK HealthCare continues to evolve, focus will be placed on capacity, throughput and the efficient delivery of care. To meet the demand for services, areas of Good Samaritan will be identified for repurposing. This may include the use of space currently leased to an outside entity for the expansion of inpatient services. We will also evaluate the need for additional OR support and recovery space, as well as the realignment of ambulatory space to provide for more efficient outpatient clinics and diagnostic and treatment services.

- **Chandler Hospital (including replacement facility)**: The goal for Chandler Hospital will be balancing the investment in current facilities with the investment in the new pavilion to ensure that we are able to provide the highest level of service in the hospital regardless of the age of the plant. Phased fit-up of the new pavilion is anticipated to occur over the next five to 10 years, as capital dollars are available. Major portions of the new pavilion programmed for the phased build-out include:
  - An operating suite including 27 ORs; recovery and intake space
  - Central Sterile Supply and staff support space
  - Six floors of 64 acute and ICU rooms
- Support service functions such as kitchen, cafeteria, environmental and engineering space
- Radiology and nuclear medicine
- Interventional services such as endoscopy and angiography
- Ancillary service space such as pharmacy and blood bank

In the current facilities we will place emphasis on renovating areas to meet the demand for services.

• Kentucky Children's Hospital: Future development of Kentucky Children's Hospital (KCH) facilities will take place over time in its current home, the Critical Care Tower (Pavilion HA), as adult services are moved into Pavilion A currently under construction. Expansion of KCH will allow for the enhancement of our neonatal ICU and our pediatric ICU, as well as support enhancement and expansion of services to pediatric outpatients and inpatients. In addressing KCH's space needs, we will design facilities that improve the patient experience, support better clinical outcomes, promote patient safety, support advanced technology and provide an efficient work environment.

• Ambulatory Services: Putting the patient's needs first will guide the expansion and upgrade of ambulatory care facilities.
  - Ophthalmology services in Kentucky Clinic will be renovated.
  - Surgical clinics will be consolidated into expanded space in Kentucky Clinic.
  - Pediatric services will continue to be centralized in Kentucky Clinic.
  - Internal medicine clinics will be expanded.
  - Five OB/GYN practices will be consolidated in a Good Samaritan clinic.
Investments in information technology (IT) will enable UK HealthCare to improve patient care, enhance communication with providers, adhere to regulations and operate profitably. The overarching goal is to have a single patient chart that can be shared across the health care enterprise to improve the quality of care we provide to our patients. Information technology will be a fundamental organizer in relationship development and making improvements to care delivery. Therefore, UK HealthCare has invested heavily in information technology.

Accomplishments

The main area of investment in information technology has included the automation of the inpatient medical record. Currently, UK HealthCare’s electronic medical record (EMR) includes computerized physician order entry (CPOE), electronic medication administration and online nursing documentation. Additionally, information systems have been implemented in the majority of UK HealthCare’s clinical areas, such as surgery, the emergency department, laboratories, radiology imaging and pharmacy.

The entire health care industry is making major investments in health care IT. The American Reinvestment and Recovery Act included a component that has provided significant emphasis on improving health care IT capabilities. We will continue to leverage IT as a means to improve UK HealthCare.

Future strategies

• Upcoming IT efforts in the inpatient setting will include the addition of electronic physician documentation, the optimization of currently installed systems and improved analytics capabilities. These actions will continue to enhance our abilities to better serve patients in the inpatient settings, as well as position us for further system development.

• Additionally, major IT investments are being made to support UK HealthCare’s growth and system integration strategies. Several multi-year IT projects are in process to provide state-of-the-art information systems in both the new pavilion at UK Chandler Hospital and at UK Good Samaritan Hospital. This will ensure that information on patient care provided in these settings will be accessible to all health care providers within UK HealthCare. The electronic integration of patient care data and information is an ongoing strategy being pursued by UK HealthCare.

• Continued investments in health care IT for the ambulatory settings are also being pursued. Implementing an electronic medical record in the ambulatory clinics is a key component to our strategies. These investments will ensure that accurate and complete patient information from all of our care settings is available to providers at any time and from any place.
• Following the success of the physician portal, UK HealthCare will pursue development of a secure patient portal. The ability to look up medications, test results, schedules and patient education will be part of this functionality.

• Major implementations in our registration, admission, scheduling and billing information systems are also in the overall IT investment plan. Automating these and other administrative functions is part of our overall strategy to continually improve our operational effectiveness and efficiency.

• Information technology will play a critical role in the organization’s plans to develop closer working relationships and collaborations with community hospitals and providers. In order to operate as a more structured system, IT must be leveraged to provide information about the patient to all of the patient’s caregivers no matter where a provider is located within the system.

The complexity of developing an electronic medical record is illustrated. UK HealthCare has already implemented a majority of the components and is now actively pursuing the most complex components such as the patient health record, health information exchange and data warehouse.
Dr. William Willard, the first dean of the UK College of Medicine, set the tone and established the lasting values for the college when he committed to educational excellence and health care for Kentuckians. Willard insisted that the University of Kentucky train physicians not only competent in the science of medicine but also sensitive to the psychosocial needs of their patients and cognizant of the public health issues of Kentucky and beyond.

**Accomplishments**

In 2004, Dr. Jay Perman was appointed the dean of the College of Medicine. He once again reaffirmed this commitment to the principles of excellence in education. Training highly competent, humanistic physicians to serve Kentucky and providing the citizens of Kentucky an opportunity to receive a quality medical education continued to be among the paramount goals of the College of Medicine. The college has been nationally recognized for its educational programs and continues to evaluate its programs to provide the most innovative learning experience for its students.

As the outstanding reputation of the college continues to grow, so have applications and the quality of students. In 2004, 990 applications were received for consideration. In 2010, this number has grown to 2,027, an increase of more than 100 percent. In addition to the increase in the applicant pool, the quality of students accepted has also continued an upward trend from a grade point average (GPA) of 3.65 in 2004 to a GPA of 3.74 in 2009. The average MCAT score of 31.0 in 2009 placed the UK College of Medicine above the national mean.

Relative to specialty training, the college has continued to increase the quality of incoming residents and fellows. For the 2010 National Residency Match program, 95 percent of the UK positions offered were on the first day, initially, and all remaining positions were filled. The quality of individual training programs has steadily improved, and today 89 percent of all residents and fellows pass their board examination. The number of residents graduating per year continues to increase with 149 in 2009, a 15 percent increase since 2006. Of all the 2009 residents, 51 percent have remained in Kentucky to practice or participate in additional training.
Going forward, new initiatives include implementation of an interprofessional to train physicians as members of a patient care team. The curriculum will emphasize patient-centered care, evidence-based practice, continuous quality improvement, patient safety, the use of informatics and teamwork.

In light of the shortage of physicians serving the Commonwealth, the college continued to stress programs in primary care, especially with a rural care emphasis. In addition to primary care, the college has also focused on training the specialists and subspecialists Kentucky requires to assure its citizens access to high-quality, contemporary care. During the past five years, much emphasis has been placed on taking education and training to rural Kentucky. UK has operated the Center for Excellence in Rural Health – Hazard since 1990. The center is focused on addressing health disparities in rural Kentucky, including a chronic shortage of health professionals and the poor health status of the area’s residents. The college is proud of the fact that more than 3,000 College of Medicine alumni are practicing in Kentucky, a testament to the college’s commitment to the well-being of the Commonwealth.

The success of UK HealthCare’s clinical growth has allowed the enterprise to fund educational and research efforts within the College of Medicine. This has been a particular benefit in light of current economic conditions and limited extramural funding sources.

**Future strategies**

In 2010, the College of Medicine reached a critical milestone – 50 years of training physicians for Kentucky. The future plans for the college will focus on its mission to educate students who possess knowledge, skills, professionalism and interest in lifelong-learning; who reflect the cultural diversity of Kentucky; who have the ability to work with health care teams and culturally diverse populations; and who have the potential to lead future health care systems in meeting the health care and research needs of Kentucky and the nation. Based on this mission, the following are strategies for the college during the next five years:

- *Attract high quality medical students, residents and fellows:* Continue the enhancement and refinement of the educational process to attract the best and brightest. Efforts will include creating appropriate space in which learning can occur, as well as financial aid strategies to enhance diversity and reduce student debt (now approaching $150,000 per student).
• Rural Physician Leadership Program: This educational program will be unique in its approach to the training of physicians, starting with community health principles in the first and second years and relying on rural community practices and experiences for training during the third and fourth years. The program will be designed to increase the number of physicians who are trained to provide high quality health care, who are knowledgeable about community health, and who will address the acute shortage of physicians in rural areas of the Commonwealth and the nation. The first site will be established in Morehead in partnership with St. Claire Regional Medical Center and Morehead State University. A second campus initiative is targeted for Murray State University and hospitals in Murray and the Purchase area.

• Promote rural outreach and engagement: The college will focus on its outreach efforts to rural health centers as a continued extension of the College of Medicine to rural communities. The Centers for Rural Health (CRH) will partner with regional universities and medical centers, as noted in the table above.

• Future educational facilities: UK has developed a conceptual facility plan for the university’s six health profession colleges. This planning effort has focused on integrated, multidisciplinary facilities. Construction of the medical campus of the future began with the College of Pharmacy building and plans call for construction to continue incrementally over the next 15 - 20 years.

UK is one of only a handful of academic medical centers in the nation that have all health profession schools - Medicine, Dentistry, Nursing, Pharmacy, Public Health and Health Sciences - on one campus. A new health science campus will help UK leverage that difference by having students in those colleges educated together, equipping them to work as a team after entering the workforce.

<table>
<thead>
<tr>
<th>Centers for Rural Health</th>
<th>Regional Academic Partner</th>
<th>Regional Medical Center Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danville</td>
<td>Pending</td>
<td>Ephraim McDowell Regional Medical Center</td>
</tr>
<tr>
<td>Hazard</td>
<td>Hazard Comm. &amp; Tech. College</td>
<td>Hazard ARH</td>
</tr>
<tr>
<td>Madisonville</td>
<td>Murray State University</td>
<td>Trover Clinic Foundation</td>
</tr>
<tr>
<td>Morehead</td>
<td>Morehead State University</td>
<td>St. Claire Reg. Medical Center</td>
</tr>
<tr>
<td>Murray</td>
<td>Murray State University</td>
<td>Murray-Calloway County Hospital</td>
</tr>
</tbody>
</table>

Preliminary master site plans for the academic medical campus of the future. The College of Pharmacy building and the Biomedical/Biological Sciences Research Building (BBSRB) at top left are already complete.
Research

Research is a requisite for all great universities, and research in the health sciences enhances the quality of care that we deliver. Institutions that participate in the development of new knowledge and the translation of research from laboratory to bedside are more likely to practice the best of care.

Accomplishments

The College of Medicine is already a research-intensive medical school, with all of the basic science departments presently ranked in the Top 20 of public medical schools. In aggregate, our basic science research portfolio rivals that of any other medical school in this country. In order to facilitate this growth and recognition in research, the Center for Clinical and Translational Science (CCTS) was established in 2006. The goal of the CCTS was to transform the pace, effectiveness and quality of clinical and translational research at UK. Through this process, we hope to prime the pipeline of research that will lead to new discoveries and better health for all Kentuckians.

Since 2004, the college’s National Institute of Health (NIH) funding has increased from $62.2 million to an estimated $83.5 million in 2010. This increase in funding has allowed the College of Medicine to improve its ranking from 35th to 28th among public medical schools in total funding from the National Institutes of Health, well on its way to Top 20 status. In fact, since the medical center colleges generate 85 percent of UK’s NIH funding and 45 percent of all of the university’s research funding, much of the race to Top 20 will depend on research productivity in the medical center.

A sample of our nationally recognized research programs includes:

- Barnstable Brown Kentucky Diabetes and Obesity Center
- Sanders Brown Center on Aging/Alzheimer’s Disease Research Center
- Lucille Parker Markey Cancer Center
- Morris K. Udall Parkinson’s Disease Research Center of Excellence
- Cardiovascular Research Center
- Center for Muscle Biology
- Spinal Cord and Brain Injury Research Center

Increases in prestigious National Institutes of Health (NIH) awards for research now place UK 28th in the nation among public medical schools in NIH funding.
• Center for Structural Biology
• Ovarian Cancer Screening Program
• Center for Drug and Alcohol Research

Because of the significant increase in the number of researchers and also a marked increase in grant funding, the college faced a serious challenge in identifying adequate facilities to house its research endeavors. In the past five years, the Biomedical/Biological Sciences Research Building (BBSRB) was completed and provided an additional 181,787 net square feet of research and office space. With the construction of the new College of Pharmacy building, two floors of lab space were completed for an additional 35,000 net square feet. In total, research lab space has increased from 178,000 in 2004 to 245,000 in 2010, a 37 percent increase.

The College of Medicine’s research space is currently 97 percent occupied. The remaining three percent is largely dated space that is inadequate for performing modern laboratory research. The college reviews space productivity annually to ensure optimal utilization. However, without new research space, future growth of its programs will be significantly limited.

Without new research space, future growth of its programs will be significantly limited.

Future strategies

• **Become fully funded in the CTSA Consortium:** A new NIH consortium, funded through Clinical and Translational Science Awards (CTSAs), will transform how clinical and translational research is conducted, enabling researchers to provide new treatments more efficiently and quickly to patients. The consortium will ultimately link 60 institutions together to energize the discipline of clinical and translational science. The University of Kentucky is poised to become one of these 60 institutions.

• **Obtain NCI designation for the Markey Cancer Center:** There are currently only 65 cancer centers in the U.S., but none in Kentucky have received National Cancer Institute (NCI) designation. Obtaining NCI designation at Markey will mean:
  - An increased draw of patients to Markey
  - Advanced clinical studies offered and more participation in clinical studies
  - Increased recruitment of nationally and internationally recognized physicians and scientists
  - National prestige as one of the best cancer centers in the country and the only one in the Commonwealth of Kentucky
- Expanded opportunities for special initiative grants
- Increased private donations and community engagement (volunteers, patient advisory groups, education and intervention programs)
- A boost to the local and state economy

- **Increase NIH funding:** Adequate research facilities are a key factor in the college’s ability to increase NIH funding. The College of Medicine is pursuing growth of research programs in areas such as cancer, cardiovascular disease, neuroscience, aging, diabetes, obesity, substance abuse and muscle biology, to name a few.

- **Expand research facilities:** Development and completion of BBSRB2 is planned, which would provide approximately 109,000 net square feet of research space. Following the national benchmark for wet lab research use, that capacity would be expected to generate an additional $37.5 million per annum in grant awards.
Since 2004, UK HealthCare has made a tremendous financial investment to assure Kentuckians have access to the most current technologies, optimal facilities and industry-leading clinical programs.

Accomplishments

In the original strategic plan, UK HealthCare anticipated investing nearly $700 million in facilities, technology and clinical programs. The actual investment over this six-year period is anticipated to approach $1 billion.

During this six-year period, UK HealthCare has created or saved more than 2,000 jobs providing a significant economic boost to the local economy. From FY04 to FY10, UK HealthCare increased salary and benefit spending by $273 million – spending $638 million in FY10. In addition to this infusion of cash, numerous construction jobs have been created within the community. This investment has positioned UK HealthCare well for the future and has been all self-funded via operating margins, cash reserves and financing.

Future strategies

- **Continue fit-up of the replacement patient care facility** - Fit-up of the new facility will continue over the next five to 10 years. Focus will be placed on expanding operating room and bed capacity. During this 10-year period, the anticipated investment will exceed $250 million.

- **Continue to invest in faculty recruitment and clinical programs** - As UK HealthCare evolves as a system, emphasis will continue on ensuring Kentuckians have access to the most advanced clinical care and technologies. UK HealthCare will continue to take a leadership role in the health care market.

- **Focus on financial efficiencies** - A focus on operational efficiencies, payor relations and flexible financing options will be continued in order to optimize financial performance. As a self-funded business, this will be critical in generating the funds required to meet the financial requirements of this strategic plan.