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INTRODUCTION

Washington University’s clinical enterprise is the foundation that supports the medical school’s broader tripartite mission. Patient care is not only a core component of our tripartite mission, our faculty group practice also:

- Provides an essential patient base for training future health care professionals
- Serves as the platform for addressing important clinical questions, fostering new knowledge and bringing new medical discoveries to the bedside
- Plays a key role in driving the clinical and financial success of WUSM’s major teaching hospitals
- Provide financial support for WUSM’s teaching and research missions

Additional information regarding the importance, size and scope of the Medical School’s faculty practice can be found in Appendix 1.

CHARGE TO WUSM CLINICAL PLANNING GROUP

The charge to the WUSM Clinical Planning Committee is three-fold:

1) Review opportunities and barriers and recommend strategies for ensuring continued growth of WUSM’s clinical practice.

2) Assess the future importance of primary care disciplines, both in meeting community need and as an ongoing source of patient referrals and determine how WUSM and its teaching hospitals should respond to these needs

3) Identify strategies and resources needed to enhance the School’s ability to provide the most advanced medical care to our community and beyond with a special focus on improving clinical quality, patient safety and the health status and well-being of our patients.

A list of the WUSM Clinical Planning Committee members is provided in Appendix 2.
CHARGE 1
ENSURING CONTINUED GROWTH OF WUSM’S CLINICAL PRACTICE

Washington University Physicians is the third largest academic group practice in the nation. The group practice is composed of 1,061 full-time faculty physicians who account for 91% of BJH and 92% of SLCH admissions. In FY07, the faculty group practice’s professional fee revenues and hospital affiliation payments from BJH and SLCH accounted for 45% of WUSM’s operating budget, making the clinical practice the largest single source of funding.

WUSM’s clinical practice is essential to the financial health of the School and its affiliated teaching hospitals. Clinical practice surpluses are used to help support the Medical School’s research and teaching missions, neither of which is financially self-sustaining. A vibrant clinical practice is therefore essential to all aspects of the Medical School’s tripartite mission.

The future ability to generate professional practice and hospital operating surpluses is highly dependent on continued growth of WUSM’s clinical enterprise. Potential barriers to continued growth include WUSM’s overall market size and competition from other providers, especially for secondary level care. The capital and recruitment costs associated with clinical practice expansion represent yet a third challenge to continued growth. Each of these challenges is discussed in further detail below.

Overall Market Size & Demographic Trends

WUSM defines its patient care markets by geographic distance from the medical center campus (See map in Appendix 3):

- Metro Central - 0-5 mile radius
- St. Louis Suburban - 6-35 mile radius
- Near Midwest - 36-50 mile radius
- Outer Midwest - 51-150 mile radius
- National/International - >150 mile radius

Combined, the Metro Central, St. Louis Suburban, Near Midwest and Outer Midwest areas encompass 4.9 million people.

<table>
<thead>
<tr>
<th>Market</th>
<th>Population</th>
<th>Proj. Population Growth Rate (2006-2011)</th>
<th>% of Unique WUSM Patients FY04-FY07</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Central</td>
<td>442,686</td>
<td>-0.4%</td>
<td>24.2%</td>
<td>1.4%</td>
</tr>
<tr>
<td>STL Suburban</td>
<td>1,914,430</td>
<td>0.6%</td>
<td>47.2%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Near Midwest</td>
<td>531,669</td>
<td>0.9%</td>
<td>6.9%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Outer Midwest</td>
<td>1,973,957</td>
<td>0.2%</td>
<td>14.3%</td>
<td>4.9%</td>
</tr>
<tr>
<td><strong>Overall Total</strong></td>
<td>4,862,742</td>
<td>0.4%</td>
<td>92.7%</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

The historic growth of WUSM’s patient base in the above geographic areas has outpaced that of the overall market population growth by 2-3 fold (3.3% annual growth for WUSM compared to an overall market population growth rate of 0.4% annually).
WUSM Planning for Excellence – Advancing Human Health
Clinical Plan

WUSM is the dominant provider in the Metro Central geographic area. While this population accounts for 24% of WUSM’s patient base, future population growth in the Metro Central region is projected to be flat. In addition, the payor mix in this market area is heavily weighted with 33% Medicaid and uninsured patients. Reimbursement for these payor groups falls below the cost of providing care.

While the St. Louis suburban market accounts for 47% of the Medical School’s patient base, WUSM’s market penetrance in suburban St. Louis is relatively low, having provided care to only 7.5% of the 1.9 million people who live in this area. This St. Louis suburban market is attractive from several perspectives including projected population growth and a favorable payor mix.

Patients living in the Near Midwest and Outer Midwest regions account for 21% of WUSM’s patient base and the remaining 7% come from beyond 150 miles. Most of these patients need tertiary/quaternary care services that are not available in their home communities.

Outpatient Care - Opportunities for Future Programmatic Growth

Population growth in the greater St. Louis metropolitan area is occurring exclusively in suburban areas. Just as BJC has developed new facilities (ex: Progress West in O’Fallon, MO) in attractive markets, it is essential that WUSM respond to changing population demographics.

While the WUMC campus is and will continue to be the dominant focus of our clinical practice activities, expanding our off-campus clinical presence, especially in the outpatient arena, will allow WUSM to attract new patients, capture additional market share, diversify its payor mix and drive more admissions and downstream revenue to BJH and SLCH.

With these goals in mind, WUSM recently opened a new orthopaedics ambulatory facility in Chesterfield, Missouri and is currently in the process of doubling the size of its ambulatory platform at Barnes-Jewish West County Hospital. WUSM also recently opened a multi-disciplinary outpatient office at BJC’s new Progress West Hospital in O’Fallon, Missouri.

To succeed, future off-campus ambulatory initiatives must offer geographically convenient, patient-focused ambulatory services in a highly efficient manner. Other critical success factors include:

- Strong brand name recognition
- Attractive market demographics
- A multidisciplinary focus encompassing commonly needed medical services and profitable clinical programs
- Same-day on-site outpatient diagnostic services and procedural facilities
- Extension of the BJH/SLCH affiliation agreement to future off-campus ambulatory satellites to help cover start-up costs and ongoing professional operating expenses via technical revenue sharing (similar to new Chesterfield Orthopaedics site)
- A faculty staffing model that supports recruitment and retention of talented clinicians by providing an academic milieu via ambulatory teaching, clinical research opportunities and/or rotation of faculty between main campus and ambulatory satellites
- A solid primary care referral base
Attractive markets for future off-campus expansion sites include South St. Louis County and the O'Fallon, Illinois area along the I-64 corridor. Both areas are within a 15-20 minute drive of the WUMC Campus.

### Adult

<table>
<thead>
<tr>
<th>2006</th>
<th>South County</th>
<th>St. Clair County</th>
<th>STL Metro Area (0-35 miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Population¹ (% of STL Metro Total)</td>
<td>253,956 (14.3%)</td>
<td>▲ 144,305 (8.1%)</td>
<td>▲ 1,781,593 ●</td>
</tr>
<tr>
<td>Historical Market Growth Rate²</td>
<td>3.9%</td>
<td>▲ 3.0%</td>
<td>▲ 1.4% ●</td>
</tr>
<tr>
<td>Historic BJH Growth Rate²</td>
<td>2.9%</td>
<td>● 13.1%</td>
<td>▲ 3.7% ●</td>
</tr>
<tr>
<td>% Insured Excluding Medicaid³</td>
<td>87%</td>
<td>▲ 84%</td>
<td>▲ 81% ●</td>
</tr>
</tbody>
</table>

### Pediatric

<table>
<thead>
<tr>
<th>2006</th>
<th>South County</th>
<th>St. Clair County</th>
<th>STL Metro Area (0-35 miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric Population¹ (% of STL Metro Total)</td>
<td>74,014 (11.3%) ▼</td>
<td>▼ 46,156 (7.1%) ▼</td>
<td>▼ 653,964 ●</td>
</tr>
<tr>
<td>Historical Market Growth Rate²</td>
<td>-3.0% ▼</td>
<td>▼ 4.0%</td>
<td>▲ 2.0% ●</td>
</tr>
<tr>
<td>Historic SLCH Growth Rate²</td>
<td>-10.0% ▼</td>
<td>▼ 11.0%</td>
<td>▲ 2.0% ●</td>
</tr>
<tr>
<td>% Insured Excluding Medicaid³</td>
<td>67% ▲</td>
<td>53% ●</td>
<td>53% ●</td>
</tr>
</tbody>
</table>

● = Growing  ▲ = Exceeding Overall STL Metro Growth  ▼ = Declining  ▼ = Trailing Overall STL Metro Growth

¹Population growth is projected from 2006-2011; Pediatric = Ages 0-17  
²Adult market based on 2003-2006; Pediatric 2004-2006  
³Insured = HMO/PPO/Commercial and Medicare; Note: TriCare (affiliated with Scott AFB) in St. Clair County is grouped in the Other category, which understates overall % insured.

### Adult Inpatient Care - Opportunities for Future Programmatic Growth

WUSM and Barnes-Jewish Hospital serve three distinct patient populations based on acuity:

<table>
<thead>
<tr>
<th>Patient Base</th>
<th>Tertiary/Quaternary</th>
<th>Metro Referral</th>
<th>Basic City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acuity</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>(level of medical complexity and specialization)</td>
<td>Inpatient</td>
<td>Inpatient/Outpatient</td>
<td>Inpatient/Outpatient</td>
</tr>
<tr>
<td>Competition</td>
<td>Growing</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Tertiary/Quaternary care is typically provided only by academic medical centers, but local providers are gaining capability</td>
<td>WUSM and BJH compete with surrounding hospitals and community specialists</td>
<td>Most patients originate close to BJH, often through the emergency department</td>
<td></td>
</tr>
<tr>
<td>Geographic Base</td>
<td>Midwest and beyond</td>
<td>St. Louis metro</td>
<td>Primarily St. Louis City</td>
</tr>
</tbody>
</table>

In CY06, BJH generated a slight pre-split margin on inpatient services, all of which was derived from the “Tertiary/Quaternary” patient population. While the “Metro Referral” inpatient population accounted for an operating loss, this was more than offset by a substantial gain from the hospital’s outpatient business, 55% of which was derived from the “Metro Referral” group.
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Clinical Plan

Of the hospital’s total pre-split margin from outpatient business, 66% is generated from imaging services, followed by radiation oncology (16%) and cardiology diagnostic lab (14%).

These data illustrate the importance of developing aggressive strategies and tactics for growing BJH’s “Tertiary/Quaternary” and “Metro Referral” patient bases.

Growing BJH’s “Tertiary/Quaternary” Care Sector

The following BJH clinical services derive 20% or more of their admissions from the “Tertiary/Quaternary” sector:

1) Cardiology/CT Surgery
2) Oncology
3) General, Acute & Critical Care, & Vascular Surgery
4) Spine Surgery
5) GI/Hepatobiliary
6) Neuroclinical
7) Pulmonary Medicine/Thoracic Surgery
8) Transplant

Insurers have the least leverage in constraining future BJH and WUSM operating margins from patients in need of “Tertiary/Quaternary” care, making this sector an attractive target for future growth. BJH and WUSM are also well positioned to leverage their unique capabilities and reputation to capture more “Tertiary/Quaternary Care” business. As noted below, the nearest major competitors for this business are 250-500+ miles from St. Louis:

- Indiana University/Clarion Health System - 250 miles
- University of Iowa - 260 miles
- Northwestern/U of Chicago/Rush - 300 miles
- Vanderbilt - 310 miles
- Mayo Clinic - 460 miles
- Cleveland Clinic - 560 miles

At the present time, over 80% of BJH’s “Tertiary/Quaternary” cases come from within 150 miles of the hospital, an area representing only 20% of the potential geographic market for tertiary/quaternary care. Accordingly, there is a major opportunity to capture additional “Tertiary/Quaternary” patient market share within a 300 mile radius of St. Louis!

Growing BJH’s “Tertiary/Quaternary” patient base will require the following major investments by WUSM and BJH:

1) Expand ICU bed capacity from 11% of total bed base (109 beds currently) to 15-20% of total bed base (during the first 9 months of CY07, BJH lost 212 transfers from other hospitals due to unavailability of critical care beds)

2) More efficient use of existing ICU bed base (opportunity is limited as ICU beds are currently running at 90-95% occupancy). Potential tactics include:

   - Establish one or more Intermediate Care (Step-Down) Units for patients who do not require ICU level care but need more support than provided on acute care nursing units
• Empower ICU medical directors to enforce unit-specific admission and discharge criteria, especially during critical care bed shortages.
• Strengthen medical coverage and nurse staffing for all ICU beds
• Liberalize admission criteria for 89 PICRU to accommodate additional ventilator-dependent patients

3) Expansion of Extended Care and Palliative Care capacity near campus

4) Expansion of BJH acute care bed capacity, especially for medical oncology, bone marrow transplant, solid organ transplant and neurosurgery-neurology patients

5) Recruitment of additional faculty in tertiary/quaternary care subspecialties, including more faculty to provide medical coverage for current and expanded ICU bed capacity

6) An aggressive Tertiary/Quaternary care marketing/physician outreach strategy targeting community hospitals and physicians within a 300 mile radius of St. Louis

Growing BJH’s “Metro Referral” Sector

While the “Metro Referral” inpatient population accounted for an operating loss in CY06, this was more than offset by a substantial gain from the hospital’s outpatient business, 55% of which was derived from the “Metro Referral” group.

The “Metro Referral” population is composed of patients with non-life threatening, medium acuity illnesses that typically require care from a medical or surgical subspecialist. The following 12 BJH clinical services depend on the “Metro Referral” population for >50% of their volume:

| Oncology       | Spine Surgery        |
| Cardiology     | Orthopaedics         |
| General & Vascular Surgery | Urology     |
| GI/Hepatobiliary | Neuroclinical     |
| Pulmonary Medicine | Thoracic Surgery |
| Otolaryngology | Ophthalmology        |

BJH and WUSM must compete with local community hospitals and community specialists for this patient sector and the competition is strong. Critical success factors include:

1) Providing timely access to care, including outpatient consultations and inpatient transfers from other hospitals

   The FPP routinely monitors access to outpatient care and has set an expectation that new patients should be offered an appointment within 14 days of patient/referring physician request (within 7 days for new cancer patients). While WUSM has made steady progress in improving access to outpatient care, new patient appointment wait times still lag behind those of many community specialists.

   Inpatient transfers to BJH from outside hospitals are coordinated through the BJH Doctor’s Access Line (DAL). During the first 9 months of CY2007, BJH lost 727 potential admissions referred through the DAL for the following reasons:
While 38% of these lost admissions were due to hospital bed or staffing constraints, 16% (117) of referred patients were ultimately sent to another hospital because of delays in identifying a BJH physician or medical service willing to accept the patient transfer.

2) **An easy and simple referral process**

Making the referral process easy and simple for referring physicians is as important as offering timely appointments. This is another area where WUSM is not always competitive with community physicians, many of whom have adopted a "Just Say Yes" philosophy. In contrast, some WUSM subspecialties require the referring physician to send medical records in advance of scheduling an appointment. In other instances, the referring physician’s office must make multiple phone calls to schedule an outpatient consultation or procedure.

3) **Service excellence, i.e. offering a patient care experience that exceeds patient and referring physician expectations**

WUSM measures service excellence in its outpatient practice by randomly surveying over 25,000 patients annually. The FPP’s goal is to “exceed” patient expectations as determined by the number of patients who rate us as “excellent” in response to 18 key questions about their care experience. While benchmark data from other physician groups are not available, WUSM’s advocacy scores are extremely high with 87% of patients giving “top box” (excellent) ratings on willingness to return to their physician and 82% “top box” on willingness to recommend their physician to others. The FPP has a robust service quality training program and has seen consistent, statistically significant improvement in its patient satisfaction scores year-over-year.

BJH measures service excellence by conducting phone interviews with patients 1 to 3 weeks after receiving their hospital care. Approximately 5,700 hospital patients are surveyed each year. Hospital-wide, 62% of patients gave BJH “top box” advocacy scores in CY2006. CY2007 YTD “top box” scores for major hospital operations are as follows:

### CY2007 Lost Admissions Through Doctor’s Access Line

<table>
<thead>
<tr>
<th>Reason</th>
<th># of Admissions</th>
<th>% to Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No bed available at BJH</td>
<td>237</td>
<td>33%</td>
</tr>
<tr>
<td>Transferred elsewhere due to delayed response by MD</td>
<td>117</td>
<td>16%</td>
</tr>
<tr>
<td>Uncontrollable factors</td>
<td>123</td>
<td>17%</td>
</tr>
<tr>
<td>Same level of care at referring hospital</td>
<td>121</td>
<td>17%</td>
</tr>
<tr>
<td>Patient/Family declines transfer</td>
<td>92</td>
<td>13%</td>
</tr>
<tr>
<td>Other controllable factors</td>
<td>37</td>
<td>5%</td>
</tr>
<tr>
<td>Total</td>
<td>727</td>
<td>100%</td>
</tr>
</tbody>
</table>

Uncontrollable Factors = Patient expired prior to transfer, bed became available at referring hospital
Other Controllable Factors = BJH staffing limitations, OR limitations or hospital on ambulance diversion

<table>
<thead>
<tr>
<th>Reason</th>
<th>% to Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No BJH bed available</td>
<td>33%</td>
</tr>
<tr>
<td>Transferred elsewhere due to delayed response by MD</td>
<td>16%</td>
</tr>
<tr>
<td>Same level of care at referring hospital</td>
<td>17%</td>
</tr>
<tr>
<td>Patient/Family declines transfer</td>
<td>13%</td>
</tr>
<tr>
<td>Uncontrollable factors</td>
<td>17%</td>
</tr>
<tr>
<td>Other controllable factors</td>
<td>5%</td>
</tr>
</tbody>
</table>
While “top box” ratings for BJH ambulatory diagnostic and treatment services are relatively high, an opportunity remains to enhance the inpatient and ED patient care experience.

4) **Geographical convenience, especially for ambulatory services and short-stay medium acuity inpatient care**

The ability to provide care proximate to where patients live is an important factor when competing for the “Metro Referral” population, especially given that these patients can choose from multiple community hospital and specialist providers.

As noted earlier in this report, the recently opened Orthopaedics ambulatory center in Chesterfield, Missouri and major expansion of WUSM’s ambulatory practice at BJWCH are designed to provide geographically convenient, comprehensive outpatient care to patients living in west St. Louis County. To be competitive with community hospitals in West County, BJH and WUSM also need to expand BJWCH’s short-stay and medium acuity inpatient bed capacity and capabilities. This includes the need to establish a community hospital level ICU for patients who experience unanticipated complications. Expanding the short-stay and medium acuity bed base at BJWCH will also allow BJH to devote more of its bed capacity to high acuity tertiary/quaternary patients and reduce the magnitude of future capital requirements for inpatient bed replacement on the WUMC campus. The specific mix of services that would utilize inpatient at BJWCH must still be determined.

5) **An aligned primary care base and strong specialist-to-specialist networks**

While some patients in the “Metro Referral” sector may self-refer, a significant portion of these patients are referred to WUSM for consultation by their primary care physician or a community specialist who feels their patient would benefit from greater subspecialty expertise (ex: obstetrician-gynecologist, general ophthalmologist, general surgeon, general neurologist, etc).

Critical success factors in building strong referring physician relationships include:

- Viewing referring physicians as full colleagues to be treated with dignity and respect
- Responding promptly to referring physician requests for consultation
- Providing timely communication and feedback on patients referred for consultation and care

The Faculty Practice Plan has established expectations and standards for referring physician interactions and periodically measures referring physician satisfaction. WUSM has also developed strong linkages with referring physicians through an
Independent Physician Association (IPA) known as Washington University Physician Network (WUPN) which provides managed care contracting services, physician credentialing and group purchasing opportunities for nearly 450 community physicians including 223 primary care physicians, 67 obstetrician-gynecologists and 159 community specialists. Another alignment tactic is Washington University Clinical Associates (WUCA), a primary care employment vehicle operated by the FPP, which currently includes 8 general internists who serve as a major source of referrals to WUSM subspecialists.

Faculty physician-to-community physician contact via continuing medical education activities on-campus and in referring physician communities is another important mechanism for building and maintaining strong referral relationships and preventing erosion of our primary care physician base.

**Pediatric Care – Opportunities for Future Programmatic Growth**

While SLCH has significant market share in the St. Louis metropolitan area, the pediatric population within a 150 mile radius is expected to decline 0.6% annually through 2011. In contrast, the pediatric population in St. Charles County is projected to grow 1% annually during this same time frame, making this area an attractive target.

In 2005, SLCH developed a four year strategic plan in collaboration with WUSM to serve as a roadmap for clinical excellence and future growth. The plan included four key components:

1) **Expanding Ambulatory Clinical Programs**

Two key tactics were developed:

1) Establish pediatric emergent-urgent care programs at select community hospital locations to act as a "feeder system" to protect market share and insure tertiary referrals to SLCH/WUSM. These satellite programs would also provide financial diversification by attracting commercially insured patients and families. SLCH and WUSM currently operate two off-campus emergent-urgent care programs – one at Missouri Baptist Medical Center and the other at Progress West Hospital in St. Charles County.

2) Develop integrated ambulatory centers providing multi-disciplinary pediatric outpatient care. SLCH and WUSM are currently developing such a site on the BJWCH campus which will include medical office space for 6 pediatric subspecialties along with imaging, outpatient surgery and other pediatric ancillary services. The goals of this program are to preserve and grow pediatric ambulatory market share and increase SLCH admissions for patients in need of hospital care. A small ambulatory pediatric presence will also be developed at BJC’s new Progress West Hospital with the goal of expanding this program over time to provide geographically convenient outpatient and low-to-medium acuity inpatient care for families living in St Charles County. Future potential sites for pediatric ambulatory center development include the Metro East and South St. Louis County areas.
2) **Improving Patient Access**

Timely access to care is essential to compete in today’s consumer-driven market, especially for non-tertiary care services. The FPP routinely monitors access to outpatient care and has set an expectation that new patients should be offered an appointment within 14 days of patient/referring physician request (within 7 days for new cancer patients). While WUSM has made steady progress in improving access to pediatric outpatient care, appointment wait times still lag behind those of many community subspecialists.

One recent advance is the creation of a new “Children’s Direct” call line for referring physicians. Using a single dedicated phone line, referring pediatricians can conveniently obtain appointments and consultations for their patients, thereby streamlining the referral process.

3) **Development of a Fully Integrated Mothers and Infants Program**

The SLCH Neonatal Intensive Care Unit (NICU) provides state-of-the-art care for a clinically and economically diverse population of patients – from extremely premature infants to full-term newborns requiring complex medical care. SLCH’s NICU capacity was recently expanded from 52 to 75 beds. The NICU provides a significant contribution to the financial viability of the hospital, accounting for less than 4% of total admissions but nearly 20% of the hospital’s annual net revenue.

Over the past three years, total births in SLCH’s primary and secondary service areas have declined by an annual rate of 1%. BJC HealthCare’s share of births declined by four percentage points during this same time frame. The disproportionate decline in BJC’s presence in the obstetrics market has a negative downstream effect on SLCH.

In order to ensure a continued stream of NICU referrals, SLCH and WUSM must develop strategies to increase access to high-risk births in both the primary and secondary service areas. Access to deliveries, both normal and high-risk, is a critical success factor in achieving this goal.

Key tactics include:

- Develop a Center for Integrated Perinatal-Neonatal Care to optimize care for high-risk pregnant women
- Enhance Maternal-Fetal Medicine and Newborn Medicine outreach activities targeted at markets with limited access to NICU capabilities
- Work collaboratively with Barnes-Jewish to enhance operations and service excellence of the BJH Obstetrics Program
- Work collaboratively with BJC’s Progress West Hospital in St. Charles County to develop an integrated Newborn Service in this growing pediatric market
- Explore the development of a Mothers & Infants Pavilion on the WUMC campus that would fully integrate the BJH Obstetrics Program and SLCH Newborn Service
Clinical Program Development designed to maintain local market dominance while further enhancing SLCH’s regional and national reputation

Clinical programs were grouped into the following three categories, taking into account existing SLCH/WUSM strengths, growth opportunities and local, regional, national and international competition.

<table>
<thead>
<tr>
<th>Programs of Differentiation</th>
<th>Programs for Targeted Growth</th>
<th>Programs for Local Investment</th>
</tr>
</thead>
</table>
| **Clinical programs that currently possess or are capable of developing SLCH’s reputation for clinical and research excellence.**  
Cardiology/CT Surgery  
Newborn Medicine  
Neurosurgery  
Oncology  
Transplant | **Clinical programs that have the opportunity to grow volume at an above average rate over the next 3-5 years and attain a significant improvement in market position.**  
General Surgery  
Orthopaedic Surgery  
Pulmonary Medicine  
Gastroenterology  
Neurology | **Clinical programs that are critical for SLCH to maintain local market dominance.**  
Otolaryngology  
Ophthalmology  
Plastic Surgery  
Emergency Medicine  
Urology  
Endocrinology  
Nephrology  
Infectious Disease  
Radiology |

Volume targets were established for the clinical programs in each of these categories and specific tactics and strategies were developed to achieve these goals.

The Children’s Discovery Institute (CDI) is an overarching strategy to further enhance the national and international clinical and research reputations of SLCH and WUSM as world leaders in developing new knowledge and cures for children afflicted with debilitating and often lethal diseases. The CDI was established in 2006 thanks to the philanthropic support of the community and uses its assets to support biologic and genetic research in four specific areas of childhood disease – pediatric cancers, congenital heart disease, pulmonary disease and musculoskeletal disorders.
Clinical Growth Strategies and Recommendations

1. Future potential off-campus expansion sites include South St. Louis County and the O’Fallon, Illinois area along the I-64 corridor. WUSM should work collaboratively with BJH and SLCH to develop business plans for multidisciplinary ambulatory satellites at these two locations to be incorporated into BJC’s CY2010-11 capital budget cycle.

2. WUSM and BJH should aggressively grow their “Tertiary/Quaternary” care business by making the following major investments:
   2.1. BJH critical care capacity should be enhanced by:
        • Fully staffing and more efficiently utilize BJH’s existing 109 ICU beds
        • Expanding BJH ICU bed capacity to 200 beds (20% of total bed base)
   2.2. The Shoenberg Pavilion on the north campus is too small to accommodate the growing demand for Oncology and Bone Marrow Transplant inpatient beds. A new cancer inpatient bed tower should be developed to meet the needs of these patients and further differentiate the Siteman Cancer Center as the leading cancer care institution in the Midwest.
   2.3. BJH non-cancer acute care medical/surgical bed capacity should be expanded, especially to accommodate neurocritical, cardiology and transplant patients
   2.4. WUSM should streamline the process for accepting referring physician and community hospital requests to transfer critically ill inpatients by always identifying a receiving attending faculty physician within 30 minutes of a transfer request coming through the BJH Doctor’s Access Line.
   2.5. WUSM should recruit additional faculty in tertiary/quaternary care subspecialties, including faculty to provide medical coverage for the current and expanded ICU bed base
   2.6. BJH and WUSM should implement an aggressive Tertiary/Quaternary care marketing/physician outreach strategy concentrated on 4 key areas: Heart care, Cancer, Transplant and Neurosciences. This marketing/outreach strategy should target community hospitals and physicians within a 300 mile radius of St. Louis as well as national and international referral bases.

3. WUSM and BJH should aggressively grow their “Metro Referral” patient base by making the following major investments and commitments:
   3.1. Develop new geographically convenient, multi-disciplinary ambulatory satellites in attractive suburban markets (see Recommendation 1)
   3.2. Develop a plan for the next phase of program expansion on the BJWCH campus, including:
        • Future medical office space needs for WUSM’s faculty practice
        • Expansion of BJWCH’s primary care base
        • Further opportunities to grow outpatient ancillaries, including outpatient imaging, radiation therapy, cardiac diagnostics and outpatient surgery
• Replacement and expansion of BJWCH’s inpatient bed base to accommodate lower acuity, short-stay medical and surgical patients who reside in the west county area.

• Enhancement and marketing of BJWCH ED capabilities to referring physicians as an alternative emergency care site for low and medium acuity patients, especially those who live in west St. Louis county

4. **WUSM, BJH and SLCH should enhance their service excellence by making the following major investments and commitments:**

4.1. WUSM should uniformly provide new patient appointments within 14 days of request (7 days for cancer patients) across 31 core subspecialties.

A portion of the annual Affiliation Agreement payment WUSM receives from its teaching hospitals is deposited into a Clinical Program Development Fund. Ensuring timely access to care in the core subspecialties should be a high priority in considering how these funds are allocated.

4.2. WUSM should reduce the burden on referring physician offices by adopting a uniform “Just Say Yes” philosophy across the 31 core subspecialties listed above in Recommendation 3.1. This would include:

- Scheduling patients immediately upon referring physician request
- Assisting referring physician offices in collecting relevant medical records needed in advance of a subspecialty consultation
- Taking the initiative to coordinate the scheduling of additional ancillary testing needed in advance of a subspecialty consultation, eliminating the need for the referring physician’s office to make multiple phone calls to schedule an appointment (ex: MRI needed in advance of a surgical consult)
- Coordinating additional subspecialty appointments when a referring physician requests consultation by more than one subspecialty (ex: elderly patient with complex chronic illness)

4.3 WUSM should ensure BJH and SLCH reduce the scheduling burden on referring physician offices by streamlining the scheduling of ancillary testing and procedures process

- Radiology at BJWCH has been gradually implementing a pre-registration service that allows referring physicians to send in electronic lists of cases and requested procedures. Once the lists are received, the department takes on the responsibilities of pre-certification and scheduling. This service has contributed to increased imaging volumes at BJWCH.

4.4 BJH should pilot and then broadly deploy an effective service excellence training program with a special focus on improving the patient care experience and satisfaction on the inpatient nursing units
5. WUSM, BJH and SLCH should strengthen their primary care base (see Charge 2 Recommendations on page 22).

6. In collaboration with SLCH and BJH, explore the development of a Mothers & Infants Pavilion on the WUMC campus that would fully integrate the BJH Obstetrics Program and SLCH Newborn Service and differentiate our collective institutions as a national leader in Mothers and Infants health care.
Background

The National Scene

Primary care disciplines include general internal medicine, family practice and general pediatrics. Obstetrician-gynecologists also serve as primary care providers for many women.

Primary care is the backbone of the nation's health care system. Primary care physicians play a critical role in coordinating the medical care needs of their patients and promoting health literacy, healthy lifestyles and preventive care.

Regrettably, medical student interest in primary care careers is diminishing as evidenced by the following facts on a national level:

- Since 1998, the percentage of Internal Medicine residents choosing a career in primary care has dropped from over 50% of graduates to less than 20%. Most graduating residents now become subspecialists or hospitalists. The ranks of hospitalists have exploded from a few hundred physicians in 1997 to 20,000 today, making it the fastest growing medical specialty in the United States.

- This same downward trend is occurring in Family Practice. The number of U.S. medical school graduates entering family practice residencies has dropped by more than 50% over the past 10 years.

- In contrast to Internal Medicine and Family Practice, interest in General Pediatrics has not diminished with over 60% of pediatric residents pursuing careers in primary care pediatrics.

The disturbing nature of these trends is further exacerbated by the fact that 35% of the nation’s physicians are 55 or older and expected to retire in the next 5-10 years. These facts recently led the American College of Physicians to warn that “primary care is at grave risk of collapse.

The declining interest in Internal Medicine and Family Practice is multifactorial in origin. There are four key drivers:

1) The growing disparity in earning potential for primary care physicians as compared to procedural specialists. This is supported by a recent review of 3,016 health care job openings conducted between April 1, 2006 and March 31, 2007:
2) The average debt for U.S. medical students graduating in 2006 was $149,460, making procedural specialties with greater earning capacity more attractive.

3) Primary care physicians are facing growing demands and pressure on their time due to:
   - The need to educate patients about the importance of wellness and prevention and to orchestrate evidence-based preventive care
   - The growing number of patients with complex and chronic medical problems such as diabetes, hypertension, heart disease and depression, much of which is driven by factors such as the epidemic growth in obesity and aging of America’s population.

   It has been estimated that it would take 10.6 hours per working day to deliver all recommended care for patients with chronic conditions, plus 7.4 hours per day to provide evidence-based preventive care to an average panel of 2,500 patients (Ostbye et al: Ann Fam Med 2005 3:209-14). These time demands breed frustration and dissatisfaction among primary care physicians.

4) Lifestyle (balancing personal and professional life) is another key driver of the declining interest in primary care. Graduates of internal medicine and pediatrics residency programs who decide not to subspecialize can still earn as much if not more than a primary care physician by choosing to work as hospitalists, a less demanding career offering regular work hours without night and weekend call.

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Average Base Salary Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Medicine</td>
<td>$161,000</td>
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<tr>
<td>Pediatrics</td>
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<tr>
<td>Internal Medicine</td>
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<tr>
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<tr>
<td>Cardiologist</td>
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<tr>
<td>Radiologist</td>
<td>$380,000</td>
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<tr>
<td>General Surgeon</td>
<td>$301,000</td>
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<tr>
<td>Orthopaedic Surgeon</td>
<td>$413,000</td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td>$239,000</td>
</tr>
<tr>
<td>Obstetrics-Gynecology</td>
<td>$247,000</td>
</tr>
</tbody>
</table>

Source: Merritt, Hawkins & Associate, 2007
The Local Scene

Many local competitor hospitals are aggressively employing primary care physicians, thereby reducing WUSM’s ability to capture patient referrals.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Approx. Staffed Beds</th>
<th>Current Employed PCPs</th>
<th>2007 PCP Recruitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BJH/BJWCH/WUSM</td>
<td>1,025</td>
<td>23</td>
<td>2</td>
</tr>
<tr>
<td>St. John’s</td>
<td>831</td>
<td>82</td>
<td>?</td>
</tr>
<tr>
<td>St. Anthony’s</td>
<td>582</td>
<td>22</td>
<td>?</td>
</tr>
<tr>
<td>Christian Hospital</td>
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<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Missouri Baptist</td>
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<td>13</td>
<td>6</td>
</tr>
<tr>
<td>SLU1</td>
<td>356</td>
<td>21</td>
<td>?</td>
</tr>
<tr>
<td>St. Luke’s</td>
<td>344</td>
<td>38</td>
<td>?</td>
</tr>
<tr>
<td>Alton Memorial</td>
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<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Barnes-Jewish St. Peters</td>
<td>101</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Progress West</td>
<td>60</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

1Includes BJH employed physicians through WUCA, BJH employed physicians through BJC Medical Group, and BJWCH employed physicians through BJC Medical Group
2PCP numbers are faculty from SLUCare

Primary Care at Washington University Medical Center

The above-cited national trends are similar to those occurring at Washington University Medical Center:

**Internal Medicine Residency Program**

- The number of graduating Internal Medicine residents choosing primary care careers has decreased by 87% over the past 10 years while the number choosing careers in Hospitalist Medicine has grown by 50%.
- Over the past 7 years, only 40 of 447 (9%) graduating Internal Medicine residents chose primary care careers with only 12 of these physicians remaining in the St. Louis community.
- The WUSM Department of Medicine has reduced the number of Internal Medicine residency slots by 5 per year (9%) due to fewer high-quality applicants.
- The number of General Internists on the medical staff at Barnes-Jewish Hospital is declining.

**Pediatrics Residency Program**

- While the majority of WUSM Pediatric residents choose to pursue subspecialty training, 29% graduating residents (an average of 8 per year) have elected to go into primary care practice. Over the past 7 years, 27 of these graduates (an average of 4 per year) have remained in the local community.
- The WUSM Department of Pediatrics attributes much of its success in attracting residents to primary care careers to a novel program, known as COPE (Community Outpatient Practice Experience) which was established in 1991. Under this program, incoming
residents are paired with community pediatricians who serve as mentors and role models. Each resident spends one half-day per week throughout their residency caring for patients in their preceptor’s outpatient office. Many of these residents are recruited by their mentors to join them in community practice after graduation. Additional program details can be found in Appendix 4.

- The number of General Pediatricians on the medical staff at St. Louis Children’s Hospital has remained relatively stable over the past 5 years.

- SLCH also has a strong relationship with surrounding community pediatricians as evidenced by:
  - 370 primary care pediatricians who accounted for 10 or more referrals to SLCH in 2006
  - The 13,659 referrals from this group of physicians accounted for 66% of SLCH admissions

**WUSM Medical Student Primary Care Exposure and Career Choices**

- All WUSM medical students have a required four week primary care experience via the ACES Program (Ambulatory Care Experience for Students). Under this program, volunteer community physicians serve as preceptors, supervising the students during at least 6 half-day clinic sessions per week. The number of participating preceptors has declined in recent years, in part because of the growing time pressures being placed on primary care physicians.

- Thanks to the availability of scholarships and financial aid, the average indebtedness for WUSM medical students is lower than the national average of $149,460. Nevertheless, medical indebtedness remains a significant factor in influencing WUSM medical student career choices.

- Over the past 7 years, only 13 (1.6%) of 816 graduating WUSM medical students elected to pursue a residency in family practice. Internal Medicine residencies were chosen by 149 (18%) of WUSM medical students and 137 (17%) elected a residency in Pediatrics although the majority of these residents went on to pursue subsequent medical or pediatric subspecialty fellowship training.
Primary Care Recommendations

The WUSM Clinical Planning Committee recommends the following steps to strengthen trainee interest in primary care careers and expansion of the Medical Center’s primary care referral base:

1) Increase the number of General Internists aligned with WUSM/BJH by expanding employment opportunities through Washington University Clinical Associates, a primary care employment vehicle operated by the FPP, and/or the BJC Medical Group. These employment vehicles should also be considered for General Neurologists and Obstetrician-Gynecologists, who also serve as primary care providers.

2) Pilot a Loan Forgiveness Program for newly recruited General Internists.

3) Pilot a Primary Care Mentorship Program which would create a defined teaching role for qualified General Internists who served as preceptors for Internal Medicine residents in an ambulatory office environment.

4) Enhance Internal Medicine resident interest in pursuing primary care careers using the Department of Medicine’s Friday Fellowship Program in which various career options are discussed. Include distinguished general internists in these presentations and describe potential practice opportunities including Washington University Clinical Associates and BJC Medical Group.

5) Create a Care Coordination Program using nurse care managers to:
   1. Help primary care physicians coordinate and optimize care across multiple providers
   2. Help patients to better self-manage their care. This type of care coordination is particularly valuable in dealing with older patients, many of whom have chronic medical conditions and multiple providers. For example, a recent study in the NEJM determined that in addition to their primary care physician, Medicare beneficiaries saw a median of five specialists over the course of a year. (Pham et al: NEJM 356:1130-39, 2007). The infrastructure provided by an organized Care Coordination Program would help primary care physicians fulfill their responsibility for coordinating care across a fragmented health care delivery system and serve as a strong physician recruitment and retention tool.

6) Improve primary care physician satisfaction by: a) streamlining faculty group practice responsiveness, communication and referral protocols, and b) improving the efficiency of hospital processes and operations (See recommendations under Charge 1 on page 17).
Our Quality, Safety & Wellness Vision

WUSM, BJH, and SLCH are committed to providing “world class” care to our patients and the community through:

- The promotion and consistent application of evidence-based medical care to ensure superior clinical outcomes and disease-specific survival rates
- Expert clinical skills, sound medical judgment and effective teamwork that sets the standard for patient safety and reduces the possibility of medical errors and preventable harm
- Primary prevention of disease through the promotion of health literacy, wellness, and healthy lifestyles
- Optimal coordination of care to improve the health status of patients with chronic medical conditions
- The promotion of innovative clinical research that will ultimately enhance patient care and outcomes
- A commitment to ensure that our faculty, fellows, residents, students and staff are well-trained in the concepts of quality and patient safety

Clinical Quality & Patient Safety

WUSM Faculty Practice Plan Quality & Patient Safety Initiatives

The Faculty Practice Plan has taken several steps to improve patient safety and clinical quality as noted below:

1) In FY08, the Faculty Practice Plan developed and sponsored a new web-based patient safety/risk management training program for clinical faculty, fellows and other caregivers. The training program has both generic and specialty-specific modules which use case studies to teach risk prevention and promote patient safety skills development. As of February 2008, 643 WUSM-employed caregivers had participated in this program.

2) The Faculty Practice Plan recently recruited a full-time Patient Safety Director to work with the WUSM clinical departments and associated hospitals to proactively identify and address patient safety concerns and system vulnerabilities before harm occurs.

3) The Faculty Practice Plan and BJH have established a joint telephone “SafeLine (7-SAFE)” to prospectively report identified situations or care processes that could result in patient harm. This allows primary prevention of errors and adverse outcomes through investigation and process improvement.
4) The Faculty Practice Plan developed new Guidelines on Patient Disclosure of Adverse Events which have been communicated to the faculty, trainees and staff through departmental meetings and grand rounds. The guidelines promote transparency of the circumstances surrounding adverse events in a non-punitive manner and sharing of information that helps prevent similar events from occurring in the future.

5) An integrated Ambulatory Electronic Medical Record is being deployed across the faculty group practice. This $14 million dollar project will enhance patient safety and clinical quality by:

- Providing faculty in WUSM ambulatory clinics with instant access to comprehensive patient information anywhere and at any time including a full problem list, summary of all medications, consultations by other subspecialists, lab and diagnostic test results, etc
- Incorporating automatic alerts (ex: abnormal lab results) and decision support logic
- Providing our teaching hospital partners with instant access to prime source patient information in order to eliminate communication errors in OR scheduling, pre-op evaluation and test results.
- Eliminating prescription fill and refill errors by automated dose checking, allergy and drug interaction alerts and elimination of illegible handwriting (currently averaging >23,000 electronic prescriptions monthly)
- Allowing electronic retrieval of key clinical data for quality assurance, process improvement and clinical outcomes research. As an example, key clinical indicators (blood pressure, hemoglobin A1c levels, blood lipid levels, urine protein) in diabetic patients are now routinely being tracked and reported back to the faculty and residents responsible for caring for this population. These data allow comparison of results across providers and help to uniformly ensure the highest standards of care and optimal care management. This capability will be expanded to support other disease-specific quality improvement initiatives.

**WUSM Department-Specific Quality & Safety Improvement Initiatives**

Several WUSM clinical departments have developed quality improvement and patient safety initiatives. A few examples are cited below:

1) The Department of Anesthesiology has a dedicated faculty position to oversee quality and patient safety, as well as a reporting system to detect and address quality/safety issues. A Quality Improvement Committee meets regularly to review department-wide efforts in peer review, safety/quality and morbidity & mortality (M&M).

2) The Department of Obstetrics & Gynecology has developed a set of specialty-specific quality indicators and holds weekly multi-disciplinary quality improvement meetings to review adverse outcomes and near misses. With support from the BJH Foundation, the Department has developed two new initiatives:
• A standardized training program for the interpretation of fetal heart rate monitor tracings during labor
• An interdisciplinary simulation curriculum for teamwork training in obstetrical emergencies.

3) The Department of Medicine is hiring a dedicated patient safety/quality officer to work with all clinical divisions in developing safety and quality initiatives. The Department is in the process of evaluating current activities and, along with the new officer, will develop a comprehensive program of quality/safety analysis and coordination of efforts and information across divisions.

4) The Division of Emergency Medicine has a dedicated safety/quality physician who coordinates the division’s activities and leads weekly reviews of identified trends in patient safety events, based upon developed screening criteria.

5) The Department of Radiology has created a Quality Improvement Office. A dedicated faculty member will devote time to coordination of the Department’s quality and safety efforts, peer review and M&M activities.

6) The Department of Ophthalmology & Visual Sciences is developing a new patient safety plan and curriculum to educate its faculty, staff and trainees.

7) The Department of Surgery is actively involved in quality research using NSQIP (National Surgery Quality Improvement Program) data, as well as internal use of NSQIP and University Hospital Consortium (UHC) data for benchmarking purposes. In addition, Cardiothoracic Surgery has become a leader in the collection of risk adjusted outcomes data for the Society of Thoracic Surgeons. Regular review of adverse events has been incorporated into M&M conferences.

8) The Department of Neurosurgery has applied for a grant to create a simulation model for improving clinical outcomes of patients with subarachnoid hemorrhage.

9) The Siteman Cancer Center/Barnes-Jewish Hospital Cancer Committee and its Quality Assurance/Quality Improvement Subcommittee regularly review performance along an array of outpatient and inpatient metrics, some of which include safety, accordance with treatment guidelines, clinical trials performance, community outreach (for education, prevention and screening), and patient satisfaction.

10) WUSM clinical departments hold regularly scheduled M&M conferences to review adverse patient outcomes. This process allows determination of root cause and identification of care processes and systems that need to be modified to prevent recurrence and enhance patient safety.
Barnes-Jewish Hospital Quality and Safety Initiatives

A sampling of quality and patient safety initiatives at BJH is provided below:

1) BJH regularly monitors over 40 key quality indicators as recommended by the Center for Medicare and Medicaid Services (CMS) (See Appendix 6). BJH ranks in the top 10% of hospitals nationally on many of these “Best-In-Class” Inpatient Quality Indicators and was recently recognized by the federal government’s Center for Medicare and Medicaid Services (CMS) as one of the top 17 hospitals in the nation (and the only hospital in Missouri) for superior clinical outcomes among patients with acute myocardial infarction.

2) BJH has joined the University Health System Consortium (UHC), an alliance of 97 academic medical centers and 153 of their affiliated hospitals. UHC provides benchmarking data from participating academic medical centers at very detailed levels. Quality indicators such as mortality and complication rates can be benchmarked by diagnosis to identify “best practice” as well as areas in need of improvement.

3) BJH has committed $46 million to roll-out Computerized Physician Order Entry (CPOE) and electronic nursing documentation and pharmacy management systems throughout the hospital. CPOE systems eliminate illegible handwriting and transcription errors and also incorporate clinical decision support tools that prevent medication errors related to improper drug dosages, unrecognized drug-drug interactions and drug allergy reactions. CPOE systems also improve the quality of care by incorporating standardized order sets derived from evidence-based best practices.

4) BJH has deployed “smart pump” intravenous infusion technology throughout the hospital. These devices offer programmable limits and other safety mechanisms to reduce the risk of dosage errors. Bar-coded medication administration technology is also being deployed to ensure the “5 rights” (right patient, right drug, right dosage, right time & right route of administration).

5) BJH has an aggressive infection control program as reflected by top decile performance nationally with respect to blood stream infections and ventilator-associated pneumonia. The hospital is viewed as a national leader in this area with its infection control prevention education programs used by other hospitals throughout the country.

St. Louis Children’s Hospital Quality and Safety Initiatives

Like BJH, SLCH regularly monitors several key quality indicators (See Appendix 7). In addition, SLCH is taking a multi-faceted approach to enhancing clinical quality and patient safety. Examples of specific initiatives are provided below:

1) SLCH has committed $14.5 million to implement a new Computerized Physician Order Entry (CPOE) and Clinical Documentation system which will be fully deployed within 24 months.

2) SLCH is a charter member of a national collaborative effort to develop key quality indicators for pediatric hospitals. Current quality metrics relate to asthma care, sickle cell
disease, neonatal immunization rates, transplant care and surgical and ICU infection rates. SLCH currently ranks in the top quartile to top decile nationally for nearly all of these quality metrics.

3) SLCH recently implemented a new model for joint medical and nursing leadership on its inpatient units. Under this model, designated physician and nursing co-leaders work with other caregivers on their inpatient units to ensure clinical excellence, with a particular focus on patient safety, clinical quality and improving team communication. Team members make regular rounds on their units and share ownership in the care of their patients. Quarterly balanced scorecards are produced for each unit to show how they are impacting clinical quality and patient satisfaction. Fourteen unit-based teams currently exist, and the enthusiastic response from staff has prompted SLCH to explore the addition of teams for Radiology and Laboratory.

4) SLCH also has a Quality and Safety Oversight Team composed of physician, nursing and administrative leadership charged with institution-wide responsibility for all clinical quality and patient safety activities, and reports to the Quality Committee of the Board of Trustees.

Role of Simulation Training in Enhancing Clinical Quality & Patient Safety

In the aviation industry, both novice and expert pilots are subjected to periodic flight simulator training. These simulators provide pilots with the training needed to ensure the safety of the crew and passengers under different flight conditions. Similar to pilots, health professionals must be prepared to practice under a variety of conditions, including emergent situations. Drawing from the aviation industry, many health care institutions have developed simulation facilities to teach critical skills, ensure clinical competence and improve clinical outcomes through interdisciplinary team training in simulated acute medical emergencies.

The BJH/WUSM Center for Clinical Simulation was created in 1996 and is located on the 3rd floor of the BJH South Campus. The Center, operated under the leadership of Dr. David Murray (Director), WUSM Professor of Anesthesiology, and Mary Klingensmith (Associate Director), Associate Professor of Surgery, currently provides simulation training for medical students, residents, fellows, faculty, nurses and other clinical support staff. The primary participants in the Center are Anesthesiology, Emergency Medicine, Nurse Anesthesia, and the Siteman nursing program. Training tools include low-tech simulators, realistic patient simulators, standardized patients, computer simulators, and complex task trainers.

As an example of the Center’s medical student training activities, all third year medical students receive small group instruction in airway management, resuscitation techniques and trauma scenarios. Fourth year students are offered electives in surgical techniques and procedures, as well as in managing common acute patient scenarios in a simulated environment. Graduate medical education program offerings include central line, airway and procedural workshops for interns and residents, individual skills assessment for interns and residents, as well as team training in managing obstetrical emergencies (under development). Further details on the BJH/WUSM Center for Clinical Simulation can be found in Appendix 5.
In September 2008, medical student simulation training and assessment programs will move to the new **Howard and Joyce Wood Center for Medical Simulation** on the 5th floor of the Farrell Learning & Teaching Center. This new facility will include four simulation suites, control rooms, debriefing rooms, a conference room and administrative offices. The facility is being constructed with the generous support of Howard and Joyce Wood, who are members of the University’s Board of Trustees and WUSM’s National Council. After September 2008, the **BJH/WUSM Center for Clinical Simulation** will be maintained as a satellite simulation training site, primarily serving residency training programs.

A third training site, still in the planning stages, will be located at St. Louis Children’s Hospital. This center, the **Saigh Pediatric Simulation Center**, is a collaborative effort involving SLCH and the Departments of Anesthesiology, Pediatrics and Surgery. Strengthening SLCH’s position as Missouri’s only comprehensive pediatric teaching hospital, simulation-based training and instruction in pediatric patient care will be offered to faculty, nursing staff, residents, medical students, and nursing students. In addition, simulation-based training for parents who care for technology-dependent children will be included as one of the training missions of the **Saigh Pediatric Simulation Center**. Plans call for simulated OR and procedure rooms, task trainers, and electromechanical mannequins.

Finally, the recently completed **Simulation Institute at the Goldfarb School of Nursing at Barnes-Jewish College** will provide skills and competency training for BJH nursing students and staff. Tools and equipment include simulation labs for acute care, OR, critical care, and maternal/child care situations. The Institute offers training with adult, child, neonate, and birthing mannequins.

**Future Opportunities to Enhance Clinical Quality & Patient Safety**

1) **Additional resources should be identified to further enhance simulation-based training and education on the WUMC campus.**

While WUSM has made a significant investment in simulation-based training, opportunities exist to more fully coordinate these activities and to make simulation resources more broadly available to our trainees, faculty and staff, as well as the community-at-large:

**Competence/Performance Assessment Training**

Within 10 years, simulation training will be used by professional societies, hospitals and state/national boards for certification to ensure that physicians meet a certain competency threshold in order to practice. By implementing simulation and performance assessment requirements for its physicians, WUMC could be ahead of this trend. All professional skill areas could be assessed, and simulation used to fill in any gaps in a physician’s practice experience and medical training.

The **Howard and Joyce Wood Center for Medical Simulation** also has a significant opportunity to serve as a community and regional resource to advance patient safety through post-graduate medical education. Due to increasing pressures on healthcare organizations to prove competence, most area hospitals and clinics would likely support sending staff to the Simulation Center for training.
Team Training

Physicians, nurses and health care professionals operate in complex environments where teams interact with technology. The increasing individual training required of experts frequently results in teams that are composed of individuals who possess unique expertise, but who require additional experiences in working interdependently with other team members. The use of simulation-based training can help to ensure highly-coordinated, effective teamwork in managing life-threatening emergencies and optimal management of serious complications.

Team training is immersive and requires half-to-full day commitments from small groups of faculty, fellows, residents, nurses and other support staff who work in a given environment. This requires an institutional commitment to free participants from their daily responsibilities to participate in interactive team training sessions. Resources are also required to design the necessary curriculum, create emergent medical scenarios to be tested during simulated training, and conduct faculty and staff debriefings following simulation activities.

To stimulate interest in team and interdisciplinary training, an internal Simulation Training Grant Program should be funded. WUSM Departments and Divisions would submit proposals and receive funding to support the development and implementation of simulation-based curricula and training programs for medical school and hospital caregivers working in high-risk environments.

Core Facilities & Faculty

Expanding and enhancing simulation-based training at WUMC also requires additional resources for core facilities, faculty and staff including:

- Hardware and software resources for virtual reality and web-based trainers
- Funding for advanced generations of mannequins
- Additional core faculty FTEs committed to education, assessment, simulation, patient safety and human factors research
- Full-time health care professionals (primarily nurses) for simulation operation, task training, and team training design and implementation
- PhD experts in psychometrics, medical education, performance assessment and instructional design

The federal Agency for Healthcare Research & Quality (AHRQ) is a potential external source of funding for simulation training, and the NIH has expressed some interest in simulation programs that are interdisciplinary in nature (i.e., involve nursing, technicians, EMS, etc). In addition to pursuing funds from these sources, the development of an Endowment for the WUSM Center for Medical Simulation would stimulate further adoption of simulation-based training and make WUSM a national leader in clinical application and innovative research and teaching in this important field.
Future Opportunities to Enhance Clinical Quality & Patient Safety (continued)

2) Each WUSM Department should develop specialty-specific quality indicators and utilize these data to facilitate clinical quality and patient safety process improvement efforts.

As an example, one approach, developed by the American College of Obstetricians and Gynecologists, is to create a specialty-specific “Adverse Outcome Index” or AOI. This weighted composite scoring system is illustrated in the table below and allows trended monitoring of the impact of quality improvement efforts in reducing the frequency of adverse events and complications over time.

Obstetrical Outcome Metrics & Scoring System

<table>
<thead>
<tr>
<th>Outcome Metric</th>
<th>Score</th>
</tr>
</thead>
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</tr>
<tr>
<td>Intrapartum or Neonatal Death &gt;2500gm</td>
<td>400</td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>100</td>
</tr>
<tr>
<td>Maternal admission to ICU</td>
<td>65</td>
</tr>
<tr>
<td>Birth trauma</td>
<td>60</td>
</tr>
<tr>
<td>Return to OR or L&amp;D</td>
<td>40</td>
</tr>
<tr>
<td>Admission to NICU &gt;2500gm for &gt;24 hrs</td>
<td>35</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>20</td>
</tr>
</tbody>
</table>

Health Literacy, Wellness & Prevention

The Importance of Health Literacy, Wellness & Prevention

Health care costs continue to escalate, currently accounting for 16% of the U.S. gross domestic product (GDP) or more than $7,000 per capita. Health care expenditures rose 6.7% in 2006, more than twice the rate of inflation, and will account for over 20% of the GDP in just 7 years. The spiraling cost of health, coupled with the fact that 47 million Americans remain uninsured, has stimulated renewed interest in health care reform.

Many factors contribute to medical inflation, including the aging population and a proliferation of new technologies and medical discoveries that redound to the benefit of society. Other cost drivers include a tendency among competing providers to generate demand for profitable clinical services, direct consumer marketing of pharmaceuticals and lifestyle choices among the American public.

While not a singular solution, advancing healthy literacy and the promotion of healthy lifestyles and preventive care offer an opportunity to improve health status and mitigate health care costs. Preventable causes of death such as smoking, alcohol abuse, poor diet and physical inactivity are estimated to cause 900,000 deaths annually – nearly 40% of total yearly mortality in the United States (ref: Mokdad et al, JAMA 2005:293:293–4). Despite the substantial impact of these lifestyle factors, the importance of preventive measures is underemphasized in our culture. For example, only 20% of smokers who try to quit receive assistance from their physicians and only 2% are prescribed pharmacotherapy (Frieden & Mostahshari, JAMA 2008:299:950952). In part, this is due
to the fact that many preventive services are poorly reimbursed or non-covered health benefits. Efficient mechanisms for identifying patients at risk for lifestyle-related diseases are also lacking.

Coordination of care and evidence-based management of patients with chronic diseases also offers the potential for improving health status and reducing health care costs. Despite this fact, only 43% of Americans with diabetes, 37% with hypertension and 25% with hypercholesterolemia have adequate control of their disease.

**What Can WUSM Do To Improve Health Literacy, Prevention and Optimal Management of Patients with Chronic Diseases?**

Preventive care has traditionally been viewed as the primary care physician’s responsibility, in part, because there is a long-term doctor-patient relationship which affords the opportunity for continuity of care. In contrast, subspecialists typically play a consultative role and may be involved in only a brief segment of a patient’s overall care.

Only a small fraction of the 1,045 physicians on WUSM’s full-time faculty practice in primary care disciplines. That said, there are several ways in which WUSM can help to promote health literacy and preventive care. Several examples follow:

1) **WUSM Participation in the St. Louis Integrated Health Network**

The St. Louis Integrated Health Network (IHN) was formed in 2004 in response to a recommendation by the St. Louis Regional Health Commission. The purpose of the IHN is to improve quality, access and affordability of health care for 320,000 low-income persons residing in St. Louis City and County. IHN participants include the 9 major area outpatient safety net providers in our community:

- St. Louis ConnectCare
- 4 Federally Qualified Primary Care Health Centers
- St. Louis City and County Health Departments
- Washington University and St. Louis University Schools of Medicine

Collectively, these safety net institutions serve over 200,000 uninsured and underinsured residents per year and account for 450,000 ambulatory encounters. WUSM is the largest provider of specialty care services to this low-income population, accounting for more than 140,000 ambulatory encounters per year.

The CEOs from each participating IHN member organization meet on a monthly basis to develop collaborative initiatives to reduce health disparities and improve access to care. A sampling of IHN accomplishments is provided below:

- Provider communication and coordination of care across participating institutions has been significantly improved
- Specialty care appointment wait times for medically underserved patients have been reduced from several months to <14 days for nearly all subspecialties
- Outside grant support has been obtained to create a Health Coaches program to promote health literacy and to help medically underserved patients navigate the safety
net health care system (>7,000 low-income patients with chronic medical conditions have been enrolled in this program).

- After-hours and weekend primary care capacity has been expanded
- **A Primary Care Medical Home Initiative** as been launched (see next section)
- The IHN is developing a **Network Master Patient Index** to allow electronic exchange of key patient data across 8 safety net institutions and the 7 area hospital ED’s that care for the bulk of low-income uninsured and underinsured patients. BJC and WUSM have provided financial support and in-kind services for this project.
- Washington University and the IHN recently partnered to renew a grant to support asthma management resources to the region.

2) **Connecting Patients to a Medical Home**

Many patients utilize the BJH ED as a surrogate for primary care. This is supported by the fact that nearly 25% of our ED patients present with non-emergent clinical needs that could be more cost-effectively managed in a primary care setting.

A 2007 survey of non-emergent patients in the BJH ED revealed that 45% lacked health insurance and utilized the ED as the provider of last resort. However, insurance was not a factor in the remaining 55% - rather, these patients stated they did not see the need to have a regular doctor or did not know where to find one. To address this problem, WUSM and BJH recently partnered with the **St. Louis Integrated Health Network (IHN)** in a pilot program to connect non-emergent ED patients with a primary care medical home. As part of this program, dedicated Community Referral Coordinators (CRC’s) have been placed in the BJH ED to counsel patients about the importance and benefits of primary care. These referral coordinators also offer to schedule follow-up appointments for these patients with one of the federally qualified health centers or county clinics that offer primary care services. During the first 3 months of the pilot program, the referral coordinators counseled 909 ED patients, 88% of whom did not have a primary care physician. Of these, 47% requested primary care appointments and 30% of these scheduled appointments were kept. This preliminary experience is encouraging. Patients enrolled in the pilot program are being followed for a 20 month period after initial referral to determine the sustainability of their newly established medical home. Metrics of success will include:

- The number of referred patients who see their primary care provider more than once during the 12 months after initial referral
- The percentage of patients referred to a primary care home who have a recurrent non-emergent ED visit within 12 months (recidivism)
- The number of referred patients with chronic medical conditions who are subsequently enrolled in a coordinated care management program
3) **Preventing Cancer and Improving Cancer Clinical Outcomes in Underserved and Minority Populations**

Each day, 34,000 people in the United States are diagnosed with cancer and another 1,500 die from the disease. Minorities, immigrants, the uninsured and low-income individuals form a larger percentage of these totals as compared to the general population. The Siteman Cancer Center is committed to reducing disparities in cancer care and clinical outcomes. These efforts are coordinated by Siteman's Program for the Elimination of Cancer Disparities (PECaD). PECaD's mission is to make state-of-the-art cancer care available to all members of our community, regardless of race, ethnicity and socioeconomic status. PECaD focuses its efforts on disease prevention and treatment of four common cancers – breast, lung, colorectal and prostate. Program activities include:

- Community screenings and health fairs
- Disparities and diversity workshop series for health care providers and lay volunteers
- Research studies focused on the elimination of cancer disparities
- Programs to increase minority participation in cancer clinical trials

Siteman’s PECaD program is supported, in part, by funding from the National Cancer Institute (NCI). Additional resources would allow the program to expand its program and impact on eliminating cancer care and outcome disparities in our community.

4) **Leverage WUSM’s Ambulatory Electronic Medical Record (EMR) to Promote Healthy Lifestyles, Preventive Care & Optimal Care Management**

WUSM is deploying an electronic ambulatory patient record across the entire faculty group practice. Electronic Medical Records (EMR’s) can be designed with preventive health as a guiding principle. For example, demographic and clinical data can be mined to identify patients with risk factors for debilitating diseases such as diabetes, chronic hypertension and cancer. These data can be used to generate a risk profile and automatically alert faculty providers to counsel patients about age and gender appropriate preventive health measures such as immunizations, mammography, colonoscopy, bone densitometry, PSA testing, lipid screening, etc.

Using scanned data from patient self-administered questionnaires, EMR’s can also be used to identify patients with unhealthy lifestyle habits such as tobacco use and prompt clinicians to counsel these patients about the health benefits of smoking cessation programs and pharmacotherapy.

Finally, EMR’s can be used to support quality assurance and quality improvement initiatives. For example, important quality indicators in managing diabetic patients include blood pressure, lipid and Hemoglobin A1c blood levels. Using an EMR, these data can be electronically extracted from patient medical records and used to give faculty, trainees and staff feedback on the effectiveness of the care they provide. These data can be aggregated across a patient population or displayed by individual provider to identify variations and foster adoption of “best practices”. An example of electronically retrieved data from 2,228 diabetic patients is provided below:
WUSM Planning for Excellence – Advancing Human Health
Clinical Plan

CY07 Diabetes Quality Metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Patients with DM</td>
<td>2,228</td>
</tr>
<tr>
<td>Number of Patients with A1C Result</td>
<td>1,726</td>
</tr>
<tr>
<td>A1C &lt; 7</td>
<td>798 (46.2%)</td>
</tr>
<tr>
<td>A1C &gt; 9</td>
<td>289 (16.7%)</td>
</tr>
<tr>
<td>Blood Pressure Recorded in Chart</td>
<td>2,141 (96.1%)</td>
</tr>
<tr>
<td>BP &lt; 130/80</td>
<td>1,343 (62.7%)</td>
</tr>
<tr>
<td>BP &gt; 140/90</td>
<td>590 (27.6%)</td>
</tr>
<tr>
<td>LDL Recorded in Chart</td>
<td>1,180 (53.0%)</td>
</tr>
<tr>
<td>LDL &lt; 100</td>
<td>704 (59.7%)</td>
</tr>
<tr>
<td>LDL &gt; 130</td>
<td>220 (18.6%)</td>
</tr>
</tbody>
</table>

5) **Create a Healthy Workplace Environment & Improve the Health of WUSM’s Employee Base**

WUSM employs over 8,000 individuals in a variety of roles – faculty, administrators, clinical support staff, research technicians, clerical staff, and skilled and semi-skilled works. Dean Shapiro recently commissioned a new **Wellness Council** composed of faculty and administrative leaders to develop tactics and strategies for improving the health of WUSM employees.

As a first step, the Medical School adopted a “tobacco free” policy in April 2007, coupled with an expansion of employee health benefits to cover smoking cessation counseling and pharmacotherapy.

To be effective, employer-based health promotion programs must be tailored to the demographics and lifestyle habits of their employee base. Ninety-six (96%) percent of WUSM employees are between 25-65 years old and 64% are women. Race and ethnicity distribution is 74% Caucasian, 14% African American, 10% Asian/Pacific Island and only 1% Hispanic and Native American. Beyond these basic demographics, WUSM has little knowledge of the health profile and disease risks faced by its employee base.

To guide the development of future employer-sponsored health promotion initiatives, WU will begin offering all employees a new web-based **Health Risk Assessment** tool (HRA) later in 2008. This new program will allow WUSM employees to assess their own health status and provide them with scientifically-validated, personalized estimates of risk for common serious illnesses including heart disease, stroke, specific forms of cancer, diabetes, hypertension emphysema, depression, osteoporosis and alcohol abuse. The new HRA tool is also designed to be educational and will provide each employee with evidence-based recommendations for reducing their disease risk profile as well as healthy lifestyle tips related to diet, smoking, physical activity and stress management. To protect employee confidentiality, WUSM administration will only have access to de-identified aggregated data. This information will be used to design new health promotion programs tailored to the needs of school employees and to monitor the effectiveness of these programs over time.
The WUSM Wellness Council also recently sponsored the Medical School’s first **Annual All Employee Health Fair**. Offerings included screening tests for common conditions such as hypertension, diabetes and lung disease as well as ergonomic evaluations, strength, balance and flexibility screening and determination of body mass index. Employees also received expert advice and health information from WUSM faculty in several disciplines including women’s health, orthopedics, ophthalmology, otolaryngology, internal medicine, dermatology, sleep medicine and physical therapy. Health-related commercial companies also participated in this event, offering information and employee discounts to their services. More than one-third of WUSM employees attended this inaugural event.

6) **Partner with Regional Business Community to Promote Preventive Care and Healthy Workplace Environments**

The WUSM Faculty Practice Plan participates regularly with several Health Fairs and lecture series sponsored by local area employers including Boeing, Schnucks, Emerson and Maritz. The ability to ask WUSM faculty experts health-related questions has been one of the most popular features at these events.

WUSM should pursue other opportunities to partner with regional employers to improve the health status of their workforces. Such efforts would not only improve the health of our community, but also generate financial returns for participating employers including lower health care costs, reduced absenteeism and improved job productivity. Given its medical expertise and experience, WUSM could help these companies design, implement and assess the effectiveness of evidence-based wellness policies, tools and programs. Such partnerships could also serve as a laboratory for health promotion research that would generate new knowledge of national and international importance.

Smoking cessation and prevention serves as a good example of the potential impact of an academic-business community health promotion partnership. Missouri has the second highest rate of smoking in the nation, with more than 10,000 Missourians dying each year of tobacco-related diseases. Despite the heavy toll caused by tobacco use, data from the Center for Disease Control (CDC) indicates that only 24% of employers offer any coverage for smoking cessation treatment and therapy. WUSM could partner with the St. Louis Regional Growth and Commerce Association (RCGA), St. Louis Business Coalition and other organizations to raise awareness among local companies of the benefits of offering their employees smoking cessation counseling and pharmacotherapy as a covered health benefit. WUSM could also offer these companies a suite of services including:

- Assistance in creating a tobacco-free workplace environment.
- Employee educational programs about the benefits and effectiveness of smoking cessation
- Clinical services including assessment of willingness to quit, behavioral counseling and pharmacotherapy
- Evaluation of program outcomes

This is but one example of how WUSM might partner with regional businesses to help them create a culture of health in the workplace.
WUSM Planning for Excellence – Advancing Human Health
Clinical Plan

Summary of Recommendations

1) Simulation-based training is a powerful tool for enhancing patient safety and clinical quality. Additional resources should be identified to better coordinate and expand simulation-based educational opportunities for faculty, clinical support staff and trainees, including competence/performance assessment and team training. An endowment for the WUSM Center for Medical Simulation could be used to support core faculty and staff as well as to provide training program grants to stimulate departmental interest in participating in simulation-based initiatives.

2) Each WUSM Department and Division should develop and regularly track a set of specialty-specify key quality indicators and utilize these data to facilitate clinical quality and patient safety process improvement efforts.

3) Medical School-Community partnerships provide an important mechanism for reducing health disparities and improving the health of our community. WUSM should build on current collaborative efforts with the St. Louis Integrated Health Network and local Federally Qualified Health Centers, including efforts to establish a primary care medical home for all low-income uninsured and underinsured persons in our community.

4) WUSM should identify additional resources to support the Siteman Cancer Center’s efforts to reduce disparities in cancer care and improve cancer clinical outcomes among minorities and other medically underserved populations in our community.

5) WUSM should leverage its electronic patient medical record (EMR) to promote healthy lifestyles and preventive care and ensure optimal care management of the patients we serve.

6) WUSM should partner with regional businesses to promote preventive care, healthy lifestyles and healthy workplace environments.
APPENDIX 1
OVERVIEW OF THE CLINICAL PRACTICE

- Washington University Physicians is the third largest academic group practice in the nation.
- Practice Statistics:
  - 1,061 full-time faculty physicians
  - 737,000 outpatient visits
  - 716,000 procedures
  - 63,750 hospital admissions in CY07
  - Account for 91% of BJH & 92% of SLCH admissions
- 78% of clinical volume is seen on the Washington University Medical Center campus (WUMC) in the following locations:
  - Center for Advanced Medicine (CAM)
  - Barnes-Jewish Hospital
  - St. Louis Children’s Hospital
  - The Rehabilitation Institute of St. Louis
- The WUSM Faculty Group Practice supports many functions that serve the medical community and strengthen the academic mission of the School of Medicine.
• Patient services represented the largest source of WUSM revenue in FY07 (40%). When combined with affiliated hospital income, clinical practice activities accounted for 45% of the Medical School’s FY07 total operating revenue.
APPENDIX 2
WUSM CLINICAL PLANNING COMMITTEE

Chair: James Crane, MD

Members:
Melvin Blanchard, MD – Internal Medicine (Co-Chair)   Laureen Hill, MD – Anesthesiology
Michael Chicoine, MD – Neurosurgery   Gil Jost, MD – Radiology
F. Sessions Cole, MD – Pediatrics   John Lynch, MD – Internal Medicine
Ralph Dacey, MD – Neurosurgery (Co-Chair)   George Macones, MD – OB-GYN
Timothy Eberlein, MD – Surgery   Ken Polonsky, MD – Internal Medicine (Co-Chair)
Lee Fetter – St. Louis Children’s Hospital (Co-Chair)   Dan Picus, MD – Radiology
Richard Gelberman, MD – Orthopaedic Surgery   Brad Racette, MD – Neurology
Jonathan Gottlieb, MD – Barnes Jewish Hospital (Co-Chair)   Greg Sicard, MD – Surgery
   (Co-Chair)   Andrew White, MD – Pediatrics (Co-Chair)
Katie Henderson, MD – Internal Medicine   Andy Ziskind, MD – Barnes-Jewish Hospital
APPENDIX 3
WUSM CLINICAL SERVICE MARKETS

- Metro Central - 0-5 mile radius
- St. Louis Suburban - 6-35 mile radius
- Near Midwest - 36-50 mile radius
- Outer Midwest - 51-150 mile radius
- National/International - >150 mile radius

October 2008
APPENDIX 4
COMMUNITY OUTPATIENT PRACTICE EXPERIENCE (COPE)

Program Overview
- The Community Outpatient Practice Experience (COPE) program was established in 1991 as a new standard of primary care education for pediatric residents.
- Interns are paired with preceptors through a match process after interviewing with multiple preceptors prior to or during orientation week.
- An intern will work with the same preceptor for one half-day per week throughout the three years of the residency.
- COPE provides the resident with a broad based pediatrics experience he/she will need in any pediatric specialty.
- In some instances, the program has convinced residents to enter General Pediatrics.
- COPE has been shown to be a source for referrals to SLCH, since preceptors prefer to have their residents see their patients.
- The program budget is split 50/50 between SLCH and the Department of Pediatrics.
- The budget covers director and coordinator salaries, preceptor awards, resident mileage, textbooks, faculty development seminars, and recruitment costs.

Curriculum
- The first year emphasizes health supervision and anticipatory guidance.
- During the second and third years, residents gain the experience of handling acute and common pediatric problems, chronic illnesses, and behavioral and developmental issues.
- Residents are also exposed to telephone call management, scheduling of patient visits, and insurance and billing practices.
- Residents must see a minimum number of patients and keep logs of their experiences, which are entered into a database for quarterly summaries.

Preceptors
- Currently, 87 community pediatricians from 48 offices are serving as preceptors.
- Practice types include solo or group practices located in rural, urban, and suburban settings, ranging in distance from 0.2 to 38 miles from SLCH (Examples: Wentzville, Edwardsville, Alton, Chesterfield, and Florissant).
- Sources of preceptors include: SLCH Physician Services Office, SLCH/WUSM residency graduates, referring physicians, and recommendations from current preceptors.
- Each preceptor agrees to a three-year, unsalaried teaching commitment. However, they are provided with clinical textbooks, faculty development seminars (CME), social networking opportunities, and a COPE Awards Banquet.
- More than 40 percent are graduates of the SLCH/WUSM pediatric residency program.
- Preceptors benefit by having the opportunity to teach and learn from the residents about the latest medical literature and electronic tools.

Future Outlook and Challenges
- Recruiting and retaining preceptors will continue to be a challenge.
- The opportunity exists to use COPE for community-based population research.
- COPE will remain in place as long as it satisfies resident needs and continues to have community and preceptor buy-in.
Overview

- Established in 1996.
- **Mission:** Improve the training of health care professionals through simulation-based education and research. The simulation center will:
  1) Provide leadership in the design, implementation and evaluation of simulation-based training
  2) Conduct training programs for medical students and other health care professionals
  3) Offer instruction, education and curriculum support for faculty and staff performing simulation-based training
- Consists of a simulation control room, observation and conference rooms, a laboratory with a mannequin, monitoring equipment, an extensive audio-video system, and a video server capable of web broadcasting.
- Tools include low-tech simulators, realistic patient simulators, standardized patients, computer simulators, and complex task trainers.

Undergraduate Medical Education Training

- Third year curriculum exposes medical students to airway management, resuscitation techniques, and trauma scenarios. Teamwork is required for successful completion of the scenarios.
- Fourth year students are offered electives in surgical techniques and procedures, as well as optional experiences in managing common acute patient scenarios in a simulated environment.
- Loeb Fellowship Projects:
  - Development of a computer-based clinical skills curriculum for third-year students which will include interpretation of electrocardiograms, chest radiographs, and pulmonary function testing.
  - Development of a simulation curriculum for pediatric acute-care scenarios (e.g., asthmatic crisis, trauma, cardiac arrhythmias) for students and residents.

Graduate and Continuing Medical Education Studies

- A Web-Based Training Program for Ultrasound-Guided Central Line Insertion (Investigators: David Murray, MD; Jim Duncan, MD, PhD)
- Teamwork in Obstetrics: A Simulation-Based Pilot Curriculum for Team Training (Investigators: Laureen Hill, MD; George Macones, MD; David Murray, MD)
- Acute Care Management Skills: An Assessment Program for Graduate Physicians (Investigators: David Murray, MD; Mary Klingensmith, MD; Joe Kras, MD)
- An Anesthesia Skills Assessment Program (Investigators: David Murray, MD; Joe Kras, MD)
## APPENDIX 6
### BJH BEST IN CLASS SCORECARD (2007)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Maximum (Top 10%)</th>
<th>Target</th>
<th>Threshold (Top 25%)</th>
<th>Minimum (Top 50%)</th>
<th>YTD (Dec06-Nov07)</th>
<th>Rolling 3 (Sep07-Nov07)</th>
<th>Points</th>
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<tbody>
<tr>
<td><strong>Infection Control</strong></td>
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<td></td>
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<td>Surgical patients receiving prophylactic antibiotic within standard 95%</td>
<td>90%</td>
<td>85%</td>
<td>75%</td>
<td>94%</td>
<td>89%</td>
<td>1.5</td>
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<tr>
<td>Selection of antibiotic for surgical site infection prophylaxis 99%</td>
<td>96%</td>
<td>94%</td>
<td>88%</td>
<td>98%</td>
<td>98%</td>
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<tr>
<td>Duration of surgical infection prophylaxis 96%</td>
<td>89%</td>
<td>83%</td>
<td>70%</td>
<td>90%</td>
<td>90%</td>
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<tr>
<td>Standardized infection ratio for ventilator-associated pneumonia</td>
<td>0.50</td>
<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td>0.11</td>
<td>0.16</td>
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<td>Standardized infection ratio for catheter-related bloodstream infection</td>
<td>0.50</td>
<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td>0.53</td>
<td>0.55</td>
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<tr>
<td>Standardized infection ratio for coronary artery bypass graft surgical site infection</td>
<td>0.50</td>
<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td>0.43</td>
<td>0.00</td>
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<td>Standardized infection ratio for hip arthroplasty surgical site infection</td>
<td>0.50</td>
<td>0.63</td>
<td>0.75</td>
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<td>0.57</td>
<td>0.00</td>
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<td>Standardized infection ratio for hysterectomy surgical site infection</td>
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<td><strong>BSI bundle (measure development)</strong></td>
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<td><strong>VAP bundle (measure development)</strong></td>
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<td><strong>Safety Culture</strong></td>
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<td>76</td>
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<td>Employee perception of top management commitment to patient safety</td>
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<tr>
<td>Employee perception of department commitment to patient safety</td>
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<tr>
<td>Employee likely to report medical errors</td>
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<td>74</td>
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<td><strong>Patient Safety</strong></td>
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<td>Falls with injury (measure development)</td>
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<td></td>
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<td>Pressure ulcer prevalence (measure development)</td>
<td>Complete</td>
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<td></td>
<td></td>
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<td></td>
<td>1.5</td>
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<td>VTE prophylaxis (measure development)</td>
<td>Complete</td>
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<td><strong>Acute Myocardial Infarction</strong></td>
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<tr>
<td>Percutaneous coronary intervention within 120 minutes of hospital arrival 90%</td>
<td>84%</td>
<td>79%</td>
<td>67%</td>
<td>100%</td>
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<td>Percutaneous coronary intervention within 90 minutes of hospital arrival</td>
<td>91%</td>
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<tr>
<td>Thrombolytic within 30 minutes of hospital arrival</td>
<td>87%</td>
<td>75%</td>
<td>59%</td>
<td>30%</td>
<td>n&lt;5</td>
<td>n&lt;5</td>
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<tr>
<td>Aspirin within 24 hours of hospital arrival</td>
<td>99%</td>
<td>97%</td>
<td>95%</td>
<td>90%</td>
<td>97%</td>
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<tr>
<td>Cholesterol testing within 24 hours of hospital arrival</td>
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<td>91%</td>
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<td>73%</td>
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<td>Aspirin prescribed at discharge</td>
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<td>94%</td>
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<tr>
<td>ACE-I/ARB prescribed at discharge</td>
<td>99%</td>
<td>95%</td>
<td>90%</td>
<td>81%</td>
<td>92%</td>
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<td>Beta-blockers prescribed at discharge</td>
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<tr>
<td>Lipid-lowering agents prescribed at discharge</td>
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<td>97%</td>
<td>95%</td>
<td>90%</td>
<td>96%</td>
<td>94%</td>
<td>1.0</td>
</tr>
<tr>
<td>Smoking cessation advice/counseling</td>
<td>99%</td>
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<td><strong>Coronary Artery Bypass Graft</strong></td>
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<td>Aspirin/Antiplatelet prescribed at discharge</td>
<td>99%</td>
<td>97%</td>
<td>95%</td>
<td>90%</td>
<td>100%</td>
<td>100%</td>
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<tr>
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<td>97%</td>
<td>95%</td>
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<td>Aspirin/Antiplatelet prescribed at discharge</td>
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<td>97%</td>
<td>95%</td>
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<td>Discharge instructions</td>
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<td>Smoking cessation advice/counseling</td>
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<td>89%</td>
<td>79%</td>
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<td><strong>Community Acquired Pneumonia</strong></td>
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<td>Antibiotic administration within 4 hours of hospital arrival</td>
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<td>91%</td>
<td>87%</td>
<td>78%</td>
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<td>Blood culture before antibiotic</td>
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<td>90%</td>
<td>96%</td>
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<td>Initial selection of antibiotic</td>
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<td>Oxygenation assessment</td>
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<td>Pneumococcal vaccine screening and/or vaccination</td>
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<td>87%</td>
<td>80%</td>
<td>64%</td>
<td>70%</td>
<td>67%</td>
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<td>Smoking cessation advice/counseling</td>
<td>99%</td>
<td>93%</td>
<td>88%</td>
<td>76%</td>
<td>90%</td>
<td>92%</td>
<td>1.5</td>
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</tbody>
</table>

**Color Key (corresponds to performance level achieved)**
- Maximum (Top 10%)
- Target (Top 25%)
- Threshold (Top 50%)
- Minimum (Top 50%)

**Due to small case volume, rolling rate for indicator is average for the 6 months ending 11/30/07.

Total Points: 48.50
Indicators: 38
Total Score: 1.28
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Maximum</th>
<th>Target</th>
<th>Threshold</th>
<th>Minimum</th>
<th>YTD (Dec06-Nov07)</th>
<th>Rolling 3 (Sep07-Nov07)</th>
<th>Points</th>
</tr>
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<tbody>
<tr>
<td>Surgical infection rate for cardiac surgery</td>
<td>0.75%</td>
<td>1.00%</td>
<td>1.25%</td>
<td>1.50%</td>
<td>1.18%</td>
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<td>Surgical patients receiving prophylactic antibiotic within standard</td>
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<td>90%</td>
<td>85%</td>
<td>75%</td>
<td>96%</td>
<td>95%</td>
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</tr>
<tr>
<td>Selection of antibiotic for surgical site infection prophylaxis</td>
<td>99%</td>
<td>96%</td>
<td>94%</td>
<td>88%</td>
<td>99%</td>
<td>98%</td>
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<tr>
<td>Standardized infection ratio for neonatal ICU ventilator-associated pneumonia</td>
<td>0.50</td>
<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td>0.41</td>
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<td>Standardized infection ratio for pediatric ICU ventilator-associated pneumonia</td>
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<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td>0.52</td>
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<td>Standardized infection ratio for neonatal ICU catheter-related bloodstream infection</td>
<td>0.50</td>
<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td>0.63</td>
<td>0.53</td>
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<tr>
<td>Standardized infection ratio for pediatric ICU catheter-related bloodstream infection</td>
<td>0.50</td>
<td>0.63</td>
<td>0.75</td>
<td>1.00</td>
<td>0.81</td>
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<td>Hand hygiene compliance</td>
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<td>70%</td>
<td>65%</td>
<td>60%</td>
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<tr>
<td>Vancomycin compliance</td>
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<td>90%</td>
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<tr>
<td>Safety Culture</td>
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<td>Employee safety climate composite</td>
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<tr>
<td>Employee perception of top management commitment to patient safety</td>
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<tr>
<td>Employee perception of department commitment to patient safety</td>
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<tr>
<td>Employee likely to report medical errors</td>
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<td>Reliever medication usage</td>
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<td>95%</td>
<td>90%</td>
<td>100%</td>
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<tr>
<td>Systemic anti-inflammatory therapy use</td>
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<td>95%</td>
<td>90%</td>
<td>100%</td>
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<tr>
<td>Unplanned readmissions within 7 days following discharge</td>
<td>0.21</td>
<td>0.42</td>
<td>0.63</td>
<td>1.05</td>
<td>0.36</td>
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<td>Unplanned return to the ED within 7 days following discharge</td>
<td>0.19</td>
<td>0.39</td>
<td>0.58</td>
<td>0.97</td>
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<td>1.03</td>
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<td>Catheter maintenance bundle compliance</td>
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<td>IOM compliance</td>
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<td>Transplant Processes</td>
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<td>Declaration in timely manner</td>
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<td>80%</td>
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<td>Timely referral rate</td>
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<td>80%</td>
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<td>63%</td>
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<td>Other Pediatric Measures</td>
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<td>90%</td>
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<td>Sickle cell readmission rate</td>
<td>0.047</td>
<td>0.094</td>
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<td>0.234</td>
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**Color Key (corresponds to performance level achieved)**
- Maximum (Top 10%) = 2.0 points
- Target = 1.5 points
- Threshold ("Top 25%") = 1.0 points
- Minimum (Top 50%) = 0.0 points
- Below Minimum (Top 50%) = -2.0 points

Total Points | 38.00
Indicators | 24
Total Score | 1.58

**Beginning with January 2007 data, a 3.88 downward point adjustment was applied to both the performance data and goals in order to accommodate changing from a 6-point response scale to a 5-point response scale.**