This document outlines Children’s Healthcare of Atlanta Research Strategic Plan Phase I and Phase II efforts that occurred from January 2007 through December 2009. All numbers used are estimates and may change due to economic conditions and/or institutional priorities.
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Executive Summary

In 2006, the Board of Trustees realized that in order to be a world class pediatric institution and improve the health status of children, Children’s Healthcare of Atlanta (Children’s) needed to develop a robust research program focused on acquiring new knowledge and expertise.

In October 2007, the Research Strategic Plan Phase I was approved by the Trustees. The plan outlined that research would be organized and conducted around five cross-disciplinary themes: Immunology and Vaccines, Experimental Technologies and Therapeutics, Genetics and Developmental Biology, Vascular Biology, and Clinical Outcomes and Public Health. These themes were intentionally designed as broad areas of investigation to support multi-disciplinary, collaborative research efforts. The Trustees allocated approximately 25% of the endowment toward research and approved an initial plan of $2M which outlined the thematic approach to research, the need to recruit a strong scientific leader for the research enterprise as well as other key leaders and to develop the research infrastructure.

In early 2009, Children’s and Emory recruited Paul Spearman, M.D. as Chief Research Officer (CRO) at Children’s and Vice Chair for Research in the Emory Department of Pediatrics (DOP). Dr. Spearman led efforts to develop the Research Strategic Plan Phase II and, through this work, validated the research themes, established goals for the enterprise and identified priority areas for initial investment. During Phase II, the Research Vision 2018 Statement, to improve the health of children through innovation and excellence in research was created as well as the overall goal to achieve a Top 10 NIH ranking by the Children’s Hospitals & Affiliated DOP combined list.

After conducting a rigorous proposal submission process, eight initial key priority areas within the Phase I themes were identified. These included the existing strong research focus within the Aflac Cancer Center and Blood Disorders Service, along with seven new priority areas. In order to create a visible and tangible research enterprise in line with our peer institutions, these chosen priority areas were designated as research centers. Research centers were designed to leverage existing strengths and capabilities at Children’s, Emory, Georgia Tech, and Morehouse School of Medicine, in alignment with the goal of becoming a top ten pediatric research enterprise. Five additional focused research areas were identified as desirable to meet institutional needs and priorities, and these remain under development as new research centers for 2010.

Six of the new centers will be recruiting a new scientific leader to serve as Center Director. Research centers will serve as catalysts for collaborative research, bringing interested researchers together, creating organized pediatric research seminar series, disseminating collaborative pilot grants, and generating new extramural funding. Core facilities will be affiliated with centers to enhance the pediatric research capacity, and will be open to all investigators affiliated with the pediatric research enterprise. Most importantly, the research centers were designed to serve as a recruiting base around scientific themes relevant to improving the health of children, and should greatly enable the expansion of pediatric research outlined by the Vision 2018 plan.

Metrics of success, critical success factors and operating strategies were identified as well. The assumptions in the 2018 financial model were finalized and the research space and package investment required for 2014 and 2018 were determined. In the Phase II plan, 42 new investigators will be necessary and 115,000 additional square feet will be required by 2018. In order to be a Top 10 program by 2018, the research enterprise will need to receive $42M in total extramural funding with $28M from the National Institutes of Health (NIH). The $42M reflects that there is constant growth and the current and new investigators are not at full capacity or 75% extramurally funded. When the new recruits and infrastructure are producing at full capacity they will have the potential to receive $76M in revenue with $50M from the NIH.
In Phase II, the total financial investment required for the research enterprise is $350M, which consists of $275M in support for recruiting and sustaining researchers and $75M for a new pediatric research building on Emory’s campus. Approximately one-half of the funding needed has been identified already through Children’s investment, existing philanthropy (primarily from Aflac) and Emory-designated funding. The outstanding $175M will be identified through other potential funding sources. Children's will maximize the overall opportunity and leverage the vast capabilities, infrastructure and commitment from Emory, Georgia Tech and other affiliates.

By implementing this strategic plan, Children's, in collaboration with its academic affiliates, has an opportunity to become a pre-eminent research enterprise. Through clinical and translational research, Children’s can continue to provide leading-edge care to the patients and create an innovative environment for the physicians.
Oversight & Approval

The development of the Research Strategic Plan Phase I and Phase II involved many individuals at Children’s Healthcare of Atlanta, Emory, Georgia Tech and Morehouse.

In Phase I, there were two work teams, one concentrated on areas of scientific focus and administration, while the other focused on operational issues and evaluated potential organizational models. The teams included various service lines, departments and representatives from the multiple work locations to ensure that all needs of the professional staff engaged in research were considered. These two teams reported to the Research Plan Sponsors Committee. The Research Plan Sponsors Committee reported to the Children’s Executive Team who reviewed the progress of the plan; the Trustees were the plan approval body. Members of this committee included:

- Jay Berkelhammer, MD, Chief Academic Officer
- Beth Howell, SVP, Academic Administration
- Kris Rogers, Director, Clinical Research Department
- Barbara Stoll, MD, Chair, Department of Pediatrics
- Jim Fortenberry, MD, Pediatrician In Chief
- Julie Trackman, Manager, Strategy & Business Development
- Paula Edwards, Director, Center for Pediatric Outcomes & Quality
- Cecelia Fleck, Special Assistant to CEO
- Don Chapman, Children’s Board of Trustees Member

In Phase II, the Research Advisory Committee (RAC) was the primary work group responsible for developing the plan. This committee met twice a month from May thru September 2009 and will continue to meet under the direction of the CRO. As centers are approved and implemented, the scientific director of the center will be appointed as a member of the RAC. Members of the committee to develop the Phase II plan included:

- Paul Spearman, MD, CRO & Vice-Chair of Research, Department of Pediatrics
- Kris Rogers, RN, Director, Clinical Research Department
- Barbara Boyan, PhD, Associate Dean for Research, College of Engineering (GA Tech)
- Joe Williams, MD, Craniofacial Plastic Surgeon
- Andy Kirsch, MD, Urology Surgeon
- Frances Dunston, MD, Chair Department of Pediatrics (Morehouse)
- Ron Joyner, MD, PhD, Director, Todd Franklin Cardiac Research Laboratory
- Nael McCarty, PhD, Associate Director CF Center
- Peter Lollar, MD, Hemophilia of Georgia Professor of Pediatrics.
- Staff attendee: Julie Trackman, Manager, Strategy & Business Development

New members of the RAC include:

- Wolfgang Cerwinka, MD, Urology Surgeon
- Lou Ann Brown, PhD, Professor, Neonatology
- Stacy Heilman, PhD, Director, Programs
- Solomon Ofori-Acquah, PhD, Hematology/Oncology.

There were several opportunities to provide input to the CRO and RAC during the strategic planning process. Town Hall meetings were held on all the three of Children’s campuses in June 2009 for staff or professionals who wanted to learn more about research planning efforts underway. Key Stakeholder meetings held monthly and included Chiefs of service and Division Chiefs; Investigator Council meetings held informally, off campus, and welcomed anyone interested in discussing research.
The RAC reported to the Research Strategic Plan Champion Guiding Team that met once a month to provide leadership and oversight for the development of the overall plan. Members of this committee included:

- Jay Berkelhamer, MD, Chief Academic Officer
- Beth Howell, SVP, Academic Administration
- Paul Spearman, MD, CRO & Vice-Chair of Research, Department of Pediatrics
- Kris Rogers, Director, Clinical Research Department
- Barbara Stoll, MD, Chair, Department of Pediatrics
- Liz McCarty, Director, Business & Finance, Department of Pediatrics
- Jim Fortenberry, MD, Pediatrician In Chief
- Julie Trackman, Manager, Strategy & Business Development
- Lela Wulf, Director of Clinical Research Department
- Barbara Boyan, PhD, Associate Dean for Research, College of Engineering (GA Tech)
- Don Chapman, Children’s Board of Trustees Member

The Research Champion Guiding Team reports to the Academic Council who provides oversight for research and teaching and is the approval body for academic vision endowment budgets. Members of the Academic Council are:

- Jay Berkelhamer, MD, Chief Academic Officer
- Ruth Fowler, SVP Finance, CFO
- Beth Howell, SVP Academic Administration
- Leslie Jones, SVP General Counsel
- Barbara Stoll, MD, Chair, Department of Pediatrics
- Paul Spearman, MD, CRO & Vice-Chair of Research, Department of Pediatrics

Staff Attendees include:

- Tom Brems, VP, Corporate Finance
- Jim Fortenberry, MD, Pediatrician In Chief
- Bill Lee, Director, Medical Staff Administration
- Liz McCarty, Director, Business & Finance, E-CC
- Kris Rogers, Director of Clinical Research Department
- Lela Wulf, Director Finance, Academic Administration
- Julie Trackman, Manager, Strategy & Business Development
- Kate Sutton, Special Projects Manager, Academic Administration

The progress of the research strategic plan was reviewed by both the Children’s and Emory Executive teams/leadership. In July 2009, the Phase II plan was presented to the Children’s Board of Trustees. In August 2009, the Phase II plan was presented at the joint meeting between the Woodruff Health Sciences Center (WHSC) and Children’s Board of Trustees.

Figure 1: Research Strategic Plan Phase II Development Structure
Organizational Review

During the last quarter of 2006, the Trustees charged the Senior Leadership Team to create a vision and a strategic plan for research. It was confirmed that in order to be a world class pediatric institution and improve the health status of children, Children’s would need to develop a robust research program focused on acquiring new knowledge and expertise in collaboration with its academic affiliates.

Strategic planning for Phase I kicked off early in 2007. The plan incorporated an extensive current state analysis which included an internal, external and market assessment. Components included how research was conducted and organized internally as well as evaluating top pediatric institutions across the county to learn best practices and compare organizational models. It was learned that other organizations do not structure research around service lines, but instead use a thematic approach. This approach emphasizes interdisciplinary efforts that correlate with the reality of clinical conditions thus focusing on more than one organ rather than disease based.

Based on these findings, it was determined that the best way for Children’s to operate and organize research efforts was through multi-disciplinary research themes that encouraged collaboration. The theme development was intended to be broader than any particular service line or department, yet not too specific thus allowing all research interests to be incorporated within a theme. With this approach, diseases, service lines, departments/specialties, affiliations and disciplines cut across the research themes and were evaluated based on their current impact and future potential. Clinical/translational research emerged as a priority area as this was understood by the Trustees to be Children’s greatest strength and future potential.

The concept of developing multi-disciplinary research areas and offering centralized resources was the model at the top pediatric institutions across the country. It was the fundamental driving factor in Children’s decision to create research themes in the Phase I plan. In addition, several Children’s service lines historically were prioritized to receive research support, while others were not, which did not always correlate to return on investment. Creating research themes allowed Children’s to be as inclusive as possible so that nearly every area could participate in collaborative research.

In October of 2007, the Trustees approved the Research Strategic Plan Phase I. The plan defined that research would be organized and developed around five cross-disciplinary themes: Immunology & Vaccines, Experimental Technologies and Therapeutics, Genetics & Developmental Biology, Vascular Biology and Clinical Outcomes & Public Health. The Trustees approved an additional $2M from spending policy/vision endowment sources to recruit research leadership and to develop the research infrastructure.

The SP/VE funds were used to recruit and hire the following positions in 2008 and 2009:

- Chief Research Officer (CRO)
- Director, Nursing Research
- Director, Research Finance
- Research Manager, Clinical Research Unit
- Research RN’s (2)
- Post Award Coordinator
- Processing Lab Tech

These funds were also used to support the following initiatives to develop the research infrastructure:

- Renovate and open the clinical research unit at Egleston
In December 2007, the Trustees adopted Vision 2018, a ten-year strategic plan with four strategic focus areas: clinical, research, teaching and wellness.

Vision 2018 is a shared vision designed to ensure that Children's is positioned for the next ten years and beyond to transform pediatric healthcare and become the leading voice for the health of children in Georgia. It will enhance clinical excellence by investing in research, teaching and wellness, while engaging our community and continuing to focus on people and managing finances. Vision 2018 requires a significant investment of resources. The Trustees approved quasi-endowments1 to fund Vision 2018 investments in the four strategic focus areas. The Trustees designated approximately 25% of the endowment toward pediatric research.

In the first quarter of 2008, a national search was led by Drs. Jay Berkelhammer and Barbara Stoll to identify a CRO. More than 50 candidates were considered and four were invited to Children's to interview. Paul Spearman, MD was named the CRO and Vice-Chair of Research at Emory University, DOP, in March 2009. The strategic planning process for Phase II started soon after he began his new role with committee meetings scheduled to begin in May 2009. Phase II planning included validating the research themes, identifying priority areas within the themes, developing goals and metrics of success and developing a five year budget for how best to use research vision endowment funding. As this process moved forward, a second committee, the Space and Packages Champion Guiding Team, developed a financial model to determine the total funding needed for research space and packages to reach Vision 2018.

Children's Mission
To enhance the lives of Children through excellence in patient care, research and education

Children's Vision
To transform pediatric healthcare and be the leading voice for the health of Georgia's children

Research Vision 2018 Statement
To improve the health of children through innovation and excellence in research

Children's will improve the health of children through the performance of innovative research, driving the creation and dissemination of new knowledge. The research enterprise will gain

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1 A quasi-endowment is similar to a “true” endowment but is established and maintained at the discretion of the Board of Trustees and is not externally or legally restricted. Quasi-endowments or “Vision Endowments” will replace Spending Policy as the funding source for future strategic investments.
national and international recognition as a top-tier pediatric research program, facilitating the clinical and educational missions through enhancing access to innovative treatments and recruitment of outstanding trainees.

**Research Objective Statement**
The primary objective is to contribute to the prevention and treatment of diseases that harm children by addressing specific research questions organized under five broad, multidisciplinary research themes.

**Research Goals**
The overall research goal is to achieve a Top 10 NIH ranking by the Children’s Hospitals & Affiliated Department of Pediatrics combined list. In order to achieve this goal, 67% of the external grant funding should be NIH and 33% non-NIH.

Other goals:
- To enhance the research profile of Children’s Healthcare of Atlanta at the national and international level through publications, presentations, grants and inventions
- To provide a user-friendly and efficient clinical research infrastructure available to investigators throughout the Children’s Healthcare of Atlanta hospitals, clinics and community
- To enhance collaborations with Georgia Tech, focusing on strengths in the development of biomedical engineering and computing solutions for child health applications.
- To build research ties and facilitate clinical and community-based research with Morehouse School of Medicine.

**Importance of Research Growth & Investment**
There are several important reasons why Children’s should grow and make a significant investment in research. First and foremost, research is a cornerstone of Children’s tri-part mission of excellence in patient care, research and teaching. Congress, the National Institutes of Health and other federal organizations all recognize the importance of pediatric research and its role in improving children’s health which aligns with Children’s research Vision 2018 statement. Investing in research increases the prestige and pre-eminence of the hospital and improves the quality of care by providing the newest treatments and achieving better patient outcomes. Research attracts federal funding dollars and increases philanthropy, additional patients and enables recruitment of the best and the brightest physician specialists and employees.

Research, particularly clinical research is conducted in children’s teaching hospitals by the same specialists that develop more effective therapies for the most complex diseases. This “bench to bedside” approach speeds the translation of research to practice for the benefit of patients and communities, and is inextricably linked to the teaching and patient care missions of children’s hospitals.

**Market**
Children’s is the largest pediatric provider in Georgia, treating 8 out of 10 pediatric inpatient cases in the Atlanta Metropolitan Service Area (MSA) and 4 out of 10 statewide. In 2008, Children’s treated 262,769 patients originating from all 159 Georgia counties. Children’s located in Atlanta has the 8th largest pediatric population and the largest projected growth of the top 10 MSA’s in the country. The large pediatric population that Children’s serves provides principal investigators more opportunities to enroll patients in their clinical studies, better ability to evaluate the effectiveness and outcome of the treatment provided and allows access to a wider pool of patients with rare diseases, etc.
Children’s also has a unique structure with 510 staffed beds in 3 different hospitals and 16 neighborhood locations with access to more than 1,700 pediatric physicians, practicing in more than 30 specialties and 6,700 employees. Children’s at Egleston is an academic medical center with Emory faculty, higher acuity patients, a focus on translational research (bench to bedside) and conducts cutting-edge research around patient care and new techniques. In contrast, Children’s at Scottish Rite is a community based hospital with private practice physicians, a focus on discoveries moving from bench to community using a multidisciplinary approach. Children’s at Hughes Spalding is an urban medical center with Emory and Morehouse faculty, has strong community engagement, provides care for primarily low socio-economic populations and conducts health disparities research.

Besides the unique internal structure, Children’s is also uniquely positioned to leverage the vast capabilities of Atlanta through collaborative relationships with Emory University, Georgia Tech, and Morehouse College.

**Current State**

In 2008, according to the NIH ranking by Children’s Hospitals & Affiliated Department of Pediatrics combined list, Children’s Healthcare of Atlanta/Emory School of Medicine was #41 receiving $7.8M dollars. Pittsburgh, #10 on this list, received $23.4M in NIH funding in 2008.

**Table 1: NIH Funding – Combined Hospital and DOP List**

<table>
<thead>
<tr>
<th>2008 Rank</th>
<th>Institute</th>
<th>Location</th>
<th>Awards (Millions)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Children’s Hospital Boston</td>
<td>Boston</td>
<td>$96.0</td>
<td>$97.0</td>
</tr>
<tr>
<td>2</td>
<td>Harvard Medical School</td>
<td></td>
<td>$9.2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cincinnati Children’s Hospital Medical Center</td>
<td>Cincinnati</td>
<td>$84.9</td>
<td>$85.1</td>
</tr>
<tr>
<td>4</td>
<td>University of Cincinnati College of Medicine</td>
<td></td>
<td>$8.1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The Children's Hospital</td>
<td>Philadelphia</td>
<td>$71.3</td>
<td>$71.6</td>
</tr>
<tr>
<td>6</td>
<td>University of Pennsylvania School of Medicine</td>
<td></td>
<td>$8.3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>St. Jude Children’s Research Hospital</td>
<td>Memphis</td>
<td>$50.9</td>
<td>$50.9</td>
</tr>
<tr>
<td>8</td>
<td>Children's Hospital</td>
<td>Aurora</td>
<td>$9.8</td>
<td>$45.2</td>
</tr>
<tr>
<td>9</td>
<td>University of Colorado Health Sci Ctr Sch of Med</td>
<td></td>
<td>$44.5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Texas Children’s Hospital</td>
<td>Houston</td>
<td>$39.5</td>
<td>$39.5</td>
</tr>
<tr>
<td>11</td>
<td>Children's Hospital &amp; Regional Medical Center</td>
<td>Seattle</td>
<td>$22.7</td>
<td>$28.1</td>
</tr>
<tr>
<td>12</td>
<td>University of Washington School of Medicine</td>
<td></td>
<td>$5.4</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Rainbow Babies and Children’s Hospital</td>
<td>Cleveland</td>
<td>$24.7</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Johns Hopkins Children’s Center</td>
<td>Baltimore</td>
<td>$23.8</td>
<td>$23.6</td>
</tr>
<tr>
<td>15</td>
<td>Johns Hopkins University School of Medicine</td>
<td></td>
<td>$18.4</td>
<td>$23.4</td>
</tr>
<tr>
<td>16</td>
<td>Children’s Hospital of Pittsburgh of UPMC</td>
<td>Pittsburgh</td>
<td>$5.0</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Children’s Healthcare of Atlanta</td>
<td>Atlanta</td>
<td>$7.8</td>
<td></td>
</tr>
</tbody>
</table>

In 2008, looking at the NIH ranking by Department of Pediatrics list, Emory School of Medicine was #27 receiving $7.8M dollars, a significant improvement from 2005 when Emory Department of Pediatrics was at a much lower ranking at #51.

**Table 2: NIH Funding - DOP List**

<table>
<thead>
<tr>
<th>2008 Rank</th>
<th>Institution</th>
<th>Location</th>
<th>Awards (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Univ of Colorado Hlth Science Ctr Sch of Med</td>
<td>Aurora</td>
<td>$42.4</td>
</tr>
<tr>
<td>2</td>
<td>Baylor College of Medicine</td>
<td>Houston</td>
<td>$38.7</td>
</tr>
<tr>
<td>3</td>
<td>Case Western Reserve Univ School of Medicine</td>
<td>Cleveland</td>
<td>$24.2</td>
</tr>
<tr>
<td>4</td>
<td>Johns Hopkins University School of Medicine</td>
<td>Baltimore</td>
<td>$23.4</td>
</tr>
<tr>
<td>5</td>
<td>Vanderbilt University School of Medicine</td>
<td>Nashville</td>
<td>$21.2</td>
</tr>
<tr>
<td>6</td>
<td>Washington University of School of Medicine</td>
<td>St. Louis</td>
<td>$19.0</td>
</tr>
<tr>
<td>7</td>
<td>Yale University School of Medicine</td>
<td>New Haven</td>
<td>$18.0</td>
</tr>
<tr>
<td>8</td>
<td>Stanford University School of Medicine</td>
<td>Stanford</td>
<td>$17.8</td>
</tr>
<tr>
<td>9</td>
<td>Indiana University School of Medicine</td>
<td>Indianapolis</td>
<td>$16.8</td>
</tr>
<tr>
<td>10</td>
<td>University of Michigan Medical School</td>
<td>Ann Arbor</td>
<td>$16.5</td>
</tr>
<tr>
<td>27</td>
<td>Emory University School of Medicine</td>
<td>Atlanta</td>
<td>$7.8</td>
</tr>
</tbody>
</table>
There are two primary national rankings for children’s hospitals, *Parents* magazine and *US News and World Report*. The *Parents* ranking is primarily based on clinical excellence. *US News* is more heavily weighted toward academic accomplishments and only ranks individual programs. Children’s has rapidly risen in the *Parents* rankings. In fact of the top 10, the scoring is extremely tight for numbers 3-10, only 50 points out of a 1,500 point scale separates #1 and #10. In 2008, Children’s ranked #8 in *Parents* Magazine and several of Children’s programs have achieved top rankings in *US News & World Report*. Two programs were in the Top 10 and four programs were in the Top 20.

**Table 3: Parents Magazine Rankings**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Children’s Hospital of Philadelphia</td>
</tr>
<tr>
<td>2</td>
<td>Children’s Hospital Boston</td>
</tr>
<tr>
<td>3</td>
<td>Children’s Hospital of Wisconsin</td>
</tr>
<tr>
<td>4</td>
<td>Cincinnati Children’s Hospital</td>
</tr>
<tr>
<td>5</td>
<td>St. Louis Children’s Hospital</td>
</tr>
<tr>
<td>6</td>
<td>Nationwide Children’s Hospital, Columbus</td>
</tr>
<tr>
<td>7</td>
<td>Texas Children’s Hospital, Houston</td>
</tr>
<tr>
<td>8</td>
<td>Children’s Healthcare of Atlanta</td>
</tr>
<tr>
<td>9</td>
<td>Rainbow Babies &amp; Children’s Hospital, Cleveland</td>
</tr>
<tr>
<td>10</td>
<td>The Children’s Hospital in Denver</td>
</tr>
</tbody>
</table>

**Table 4: US News & World Report Rankings**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>#5</td>
<td>Orthopedics</td>
</tr>
<tr>
<td>#7</td>
<td>Heart &amp; Heart Surgery</td>
</tr>
<tr>
<td>#12</td>
<td>Cancer</td>
</tr>
<tr>
<td>#12</td>
<td>Digestive Disorders</td>
</tr>
<tr>
<td>#17</td>
<td>Respiratory Disorders</td>
</tr>
<tr>
<td>#18</td>
<td>Urology</td>
</tr>
<tr>
<td>#26</td>
<td>Neurology &amp; Neurosurgery</td>
</tr>
<tr>
<td>#26</td>
<td>Diabetes/Endocrine Disorders</td>
</tr>
<tr>
<td>#29</td>
<td>Kidney Disorders</td>
</tr>
</tbody>
</table>

Emory’s Department of Pediatrics (DOP) has grown and achieved many milestones from 2004 through 2009. In 1998, Egleston and Scottish Rite merged to form Children’s Healthcare of Atlanta and at this time there was a fractured relationship with Emory. It was not a cohesive, collaborative relationship and Pediatrics was not a prioritized department within the School of Medicine and it had no dedicated space with the exception of a few temporary trailers. In 2002, the relationship began to improve and there was a joint board meeting to confirm the vision for the future to be a preeminent healthcare institution for children.

A Chair was recruited in 2004 and it was a bellwether year for the DOP. The improving relationship between Emory and Children’s culminated in a jointly envisioned plan for the DOP supported by a $20M co-commitment from Children’s and Emory and a new building in 2005. This vision and the investments in facilities and programs (clinical, research and teaching) set the stage for recent growth.

During the past five years much progress has been made with specialty shortages. In 2004, the clinical enterprise was terribly understaffed in 9 specialties but in 2009 only two specialties were still understaffed. In teaching, there is a competitive residency program that was recently re-accredited. It grew from 54 to 60 pediatric residents during the same time period. Fellowships also increased from 16.5 to 64. In research, the DOP was awarded $3 million in NIH funding in
Research is one of the main components in the relationship between Children's and Emory. Over the last 10 years, research grant funding has increased significantly. Since 2004, when the new Chair of Pediatrics was recruited, NIH and other funding steadily increased each year demonstrating the growth trajectory of new recruits and success to date.

Figure 3: DOP Growth Trajectory

Together, We Are Making Strides in Pediatric Research…
Development

The Research Strategic Plan Phase II was developed according to the following framework.

- **Research Themes**
  The plan validated that research would be organized and conducted around five cross-disciplinary themes: Immunology & Vaccines, Experimental Technologies and Therapeutics, Genetics & Developmental Biology, Vascular Biology and Clinical Outcomes & Public Health. These themes are broad areas of study that foster interdisciplinary collaboration and cross communication between departments. They encompass more than a single disease/condition to allow potential to address issues related to multiple pediatric health problems.

- **Pediatric Research Centers**
  A pediatric research center falls within one or more of the research themes and is a multidisciplinary enterprise that requires a major investment, multiple NIH-funded investigators, and at a minimum is expected to generate $4-5 million in direct NIH funding per year at maturity. Centers must cross divisions/service lines/institutions and represent areas where there are significant childhood health problems and leverage existing strengths. Each center will have a scientific director that is a leader in their respective fields and a corresponding center budget.

- **Research Cores**
  Research core laboratories are centralized resources that support various investigators in multiple centers and research programs by providing state-of-the-art and other rigorous and expensive research technologies, including the associated equipment and technical expertise. Cores are an efficient and cost-effective way to share technical resources rather than buying expensive equipment and staffing individual labs. Cores facilitate collaboration through multiple investigators using the same physical space to conduct their research and help to generate and facilitate extramural funding by providing robust central resources to demonstrate institutional commitment and a leveraged research environment. Cores will be open to all investigators within the Children’s research enterprise on a fee for use basis, with generous subsidies provided for users with a pediatric research focus.

- **Research Infrastructure**
  Research infrastructure is a general term to describe all centralized resources to support research activities and investigators. In 2009, the research infrastructure includes the services that the clinical research department provides to support all research activities that occur at Children’s facilities or otherwise involve Children’s faculty, staff, resources or property. The Children’s Clinical Research Department provides infrastructure through the following main functions: Institutional Review Board (IRB), Grants Accounting and Contracts Support, Research Nurses and Coordinators, and the Office of Research Compliance (ORC).

  The IRB determines that the rights and welfare of the subjects are protected adequately, the risks to subjects are outweighed by the potential benefits of the research, the selection of the subjects is equitable and informed consent will be obtained and documented. In September 2009, the Children’s IRB achieved accreditation from the American Association of Human Research Protections Programs (AAHRPP) becoming the 5th children’s hospital to achieve this distinction.
The office of grants accounting and contracts manages all pre and post award grant and contract activity. Pre-Award, the Children’s Clinical Research Department assists investigators with study design, grant application, budget preparation, and IRB issues that arise. They help to negotiate prices and a discount for services used at Children’s to conduct research projects (such as laboratory, radiology and non-invasive cardiology services) and facilitate negotiation and execution of research contracts/agreements. Post-Award, the Clinical Research Department helps to monitor research grants, contracts/agreements and grant expenditures. They review and monitor monthly financials on sponsored projects and ensure all patient care invoicing and accurate grants accounting. The office of grants accounting also assists to facilitate reporting to sponsors as required.

The Clinical Research Department assigns research nurses and coordinators to various departments throughout Children’s to provide project coordination and execution. The research nurses help to provide clinical support by coordinating IRB and regulatory activities, clinical trial registration, sponsor correspondence and education/feasibility with other departments. They also identify subjects and receive consent from families, schedule procedures, obtain specimens, collect and monitor quality of data, provide statistical support and communicate billing and invoice information.

The ORC is committed to the development of a Research Compliance Program that includes the development and distribution of written policies, procedures, and standards of conduct that promote adherence to applicable federal and Georgia State laws, regulations and institutional policies. The department handles quality assurance audits, research integrity and scientific misconduct issues, conflicts of interest issues and ensuring that Children’s is compliant with HIPAA.

The Clinical Research Department facilitates other resources to support research activities and investigators. For statistical services, Children’s uses the Biostatistics Consulting Center (BCC) at the Rollins School of Public Health at Emory University for comprehensive statistical consultation, support and computational services. Children’s also has a research processing lab within the cellular therapies lab to facilitate research specimen process, specimen storage and specimen shipping.

There are also many research funding opportunities at Children’s. In 2000, Children’s community volunteers known as “Friends” established a unique research initiative to fund Children’s physicians and fellows’ clinical research projects that translated directly to the improvement of quality care to Children’s patients. A designated portion of Friends annual fundraising efforts contributes to this fund. The Friends Research Fund is open to all members of the Children’s Professional Staff who provide services on site in one of Children’s facilities and supports competitive grants up to $50,000 biannually. These grants are for well-defined research projects, pilot studies and seed grants that typically run 6-18 months. The Clinical Research Oversight Committee (CROC) reviews competitive applications and makes grant awards twice a year. The Friends budget was increased to $200,000 per year during the Phase I strategic planning process.

The Dudley L. Moore Nursing & Allied Health Research fund fosters growth of existing and new translational research for all nurses and allied health professionals. It was created through a generous commitment from the Dudley Moore family and research supported by this fund includes: respiratory therapists, clinical bedside nurses, physician assistants, nurse practitioners and other advanced practice clinicians, all complementing Children’s other research efforts. The Nursing and
Allied Health Research Committee reviews competitive applications and makes grant awards on a yearly cycle. The Dudley Moore budget was increased to $45,000 per year during the Phase I strategic planning process.

The Emory Egleston Children’s Research Center (EECRC) established a seed grant program to fund basic and clinical research toward understanding the mechanisms and potential treatments for diseases of children. These grants are only for Emory faculty within the School of Medicine (SOM) and clinical investigators in departments other than Pediatrics must have staff privileges at Children’s. These grants are funded jointly by Children’s and the Emory University SOM. EECRC budget was increased to $600,000 per year during the Phase I strategic planning process.

In 2006, the Health Systems Institute (HSI), with funding from Children’s and the Colleges of Engineering and Computing at Georgia Tech, established a seed grant program to foster and support innovative, collaborative and interdisciplinary research projects. The program is for Georgia Tech/Emory faculty and/or Children’s investigators. A scientific committee of experts from Georgia Tech, Children’s and Emory evaluates proposals, submits recommendations to the sponsors and provides administrative oversight. The committee prioritizes projects based on outcomes that can improve patient care. Each proposal is evaluated based on: scientific merit; probable health care impact and significance; and potential for commercialization and successfully obtaining further support. The HSI seed grant program budget was maintained at $500,000 per year during the Phase I strategic planning process.

Through the Phase I Research Strategic Plan, Children’s designated a Core Utilization Fund of $75,000 to provide investigators support to use core laboratories at Emory. The idea of starting this fund was to track core usage over time to help identify potential future cores needed. Over the last two years ten investigators have utilized this fund and $41,666 has been spent through August 2009. The remaining amount remains in a dedicated fund within the EECRC and this program will end in December 2009.

The Children’s Pediatric Research Center was established in November 2008 at Egleston and is a new clinical interaction research site of the Atlanta Clinical and Translational Science Institute (ACTSI). The ACTSI is a multi-institutional partnership led by Emory University and was collaboratively developed through a grant award from the NIH by Emory University, Georgia Tech and Morehouse to effectively translate scientific discoveries into the clinical setting. The center has a four-bed inpatient research unit, a four-bed outpatient research unit, a core research lab and research pharmacy services and bionutrition services. It is designed to provide the necessary infrastructure and support services for investigators conducting pediatric clinical research.

**Research Theme Validation**

During the Phase II Strategic Plan process, the following five themes were validated from Phase I and adopted.

- **Immunology & Vaccines**
  The study of diseases caused by disorders of the immune system (failure, aberrant actions, and malignant growths of the cellular elements of the system). It also involves diseases of other systems, where immune responses play a part in the pathology and clinical features. Areas of study would include: Autoimmunity, Asthma, Arthritis, Bone Marrow Transplantation, Organ Transplantation, Cancer,
HIV-AIDS, Immunodeficiency Diseases, Infection, Inflammatory Bowel Disease, Response to environmental toxins, etc.

- **Experimental Technologies and Therapeutics**
  The development of new techniques, technologies and therapeutics to diagnosis, treat and/or cure disease. Areas of study would include: Infection, Cancer, Blood Disorders, Congenital Heat Disease, Obesity, Asthma, Hemophilia, Urologic/Renal Disorders, Sickle Cell Disease, Congenital Anomalies, Autism, Epilepsy, etc.

- **Genetics & Developmental Biology**
  The study of the basic cellular and molecular mechanisms of development with the aim of uncovering the bases of human birth defects so that they can be prevented or corrected. Research in this area also focuses on the cause and possible treatment of childhood diseases. Areas of study would include: Disease Severity, Predictive Medicine, Autism, Diabetes, Heart Disease, Renal Disease, Congenital Anomalies, Epilepsy, Cancer, Muscular Dystrophy, Cystic Fibrosis, Tissue Engineering, etc.

- **Vascular Biology**
  The study of complex interactions between the vessels and endothelial lining of the vasculature (the body's largest organ) on other organs in a variety of systemic responses. Areas of study would include: Hemophilia, Hemangiomas, Congenital Heart Disease, Endothelial Biology, Respiratory Failure, Shock, Sepsis, Sickle Cell Disease, Thrombosis, Liver Disease, Hepatopulmonary syndrome, Asthma, Pulmonary Hypertension, Cancer, etc.

- **Clinical Outcomes & Public Health**
  Clinical outcomes is focused on the diagnosis, prognosis and evaluation of treatments as well as efforts to study how the health system functions so that its performance can be improved. Public Health research initiatives are focused on the prevention of disease through surveillance and promotion of healthy behaviors. Areas of study would include: Asthma, Autism, Biomedical Ethics, Child Advocacy, Nursing – quality of life & Evidenced Based Practice, Obesity, Trauma, Injury Prevention, Health Delivery, Disparities, Poison Control, Outcomes, Wellness, etc.

**Prioritization**
The next step in the planning process was to identify major research initiatives that would fit within the identified themes. Key stakeholders and thought leaders were asked to provide input by submitting concept proposals to assist the CRO and members of the RAC to better understand what the current major groups and leaders within Children’s and affiliate institutions consider top priorities in their area of expertise. The goal was that this process would identify major areas of focus and strengths within Children’s growing enterprise that would foster the best science.

Research stakeholders were asked to submit one or two concept proposals within a particular area describing a potential center and/or program. An area was defined to be a division/service line/specialty/practice group, etc. and it was asked to coordinate within their area before submitting to avoid competing applications. Any investigator who was a Children's Healthcare of Atlanta professional staff or faculty in the DOP at Emory was eligible to submit a proposal. Collaborative submissions that included other departments, institutions, centers, etc. were strongly encouraged, as long as key investigators with a well-defined leadership role in the Center proposed were members of Children's professional staff or DOP faculty. Children's encouraged submissions from key investigators at Georgia Tech involved in several child health-related activities that already have existing strong collaborations with investigators and professional staff at Children's. Finally, investigators at Morehouse engaged in child health-
related research in collaboration with professional staff at Children’s or the DOP at Emory were also encouraged to submit proposals.

Specific guidelines were given for concept submission. Proposals were to be no more than five single-spaced pages, using at least 11 point font and 0.5 margins with 1-page for a high level budget justification as page 6 as well as a 1-page reference sheet. Concept proposals were to answer the following questions and provide the following information. Which research theme does the concept address and synergize? How will the research address a major problem affecting the health of children? What existing strengths at Children’s or affiliated institutions does the concept take advantage of? What opportunities are there to leverage funds from other sources at the outset of this enterprise? How will the center/program be unique or distinguish itself in the field? Does it address a unique need? Provide a brief outline of the scale of investment envisioned, space required, and plan for acquiring extramural funding to provide the majority of ongoing support for this enterprise.

It was also clearly communicated how to receive a better score for concept proposal submissions and which ones would likely not be funded. Proposals that reach beyond a service line, division, specialty, or other narrow focus or silo would likely receive a better score by promoting multi-disciplinary research, and encouraging collaborations beyond existing research groups. Concept proposals were not to fund individual investigator projects which could be funded competitively through the seed grant programs but should address a major area of concern to child health. Concept proposals should show an extramural funding plan that proposes a clear means of reaching 75% of independent support from NIH funding being credited to Children’s or the DOP at Emory. If extramural funds would be credited elsewhere, Children’s must receive credit in other tangible ways from national organizations to be considered. Concept proposals outlining recruitment of new investigators with NIH grants (or other national sources, i.e. NSF) would be well-received. Last, not all service lines or divisions would have a natural center or program that will be a “mature” concept and therefore would not likely be funded if submitted.

Finally, stakeholders submitting research concept proposals were told the criteria that the Research Advisory Committee (RAC) would use to score and rank concepts. The criteria were:

- **Significance**
  How significant is the proposal to child health? If the proposed research is disease-related, how important is the disease in causing morbidity or mortality of children or adolescents? If the proposed research is basic or fundamental in nature, how well does the program/center/project align with a major research theme? If technological or translational in nature, does the proposal tie to one of the service lines at Children’s?

- **Impact/Context/Leveraging**
  How likely is this program/center/project to have a major impact in the field? What local strengths or resources, such as existing institutional strengths, expertise, initiatives, state directives or interests, or other local context makes the impact of the program/center/project likely to be high? Are resources available from partner institutions or existing entities that can be leveraged to enhance the success of the proposed program/center/project? Does the program/center/project serve as a focal point for recruiting top-notch faculty?

- **Advocates/Investigators**
  Are the individuals proposing the program/center qualified? Are there strong local advocates for the program/center/project who will work tirelessly for its success? Are there definitive ties to Children’s’ partnering institutions? Does the team include
basic scientists and clinician-scientists? Are the investigators experienced with mentoring scientists proposed within the program or center?

- **Innovation/Opportunity**
  Does the program or center represent a compelling opportunity with an innovative approach to enhance the health of children that is not already widely pursued? Will the program or center at its peak be seen as one of the top entities of its kind in the nation? Are there opportunities for unique inventions associated with the program or center?

- **Extramural Funding**
  Are the plans for extramural funding solid and evidence-based? Is the area one that represents a priority for funding from the NIH, NSF, or other major funding source? Is the funding in this area likely to be sustainable? Does the program/center/project represent an opportunity for philanthropic support? Does the program or center have a viable sustainability plan? Will the program or center generate unique intellectual property?

Concept proposals were submitted in July 2009 and were distributed among the members of the RAC for review. All submitted applications were treated in a confidential manner and were not shared outside of the RAC. Members of the RAC were assigned to evaluate and score specific concept proposals. There was a primary reviewer and a secondary reviewer for each concept proposal and the overall process was very similar to how the NIH handles grant submissions. Scores were based on a five point scale, where a 1.0 score is outstanding and a 5.0 score is unacceptable. All preliminary scores were compiled for the RAC Study Section meeting that took place on Saturday, July 25, 2009.

At this meeting, the purpose was to score the proposals but a higher score would not necessarily mean that the concept proposal would receive funding. Other criteria were factored in and involved other individuals within Children’s to determine the overall priority areas. However, the RAC was used to score the proposals based on the scientific criteria established.

The following process was used at the RAC meeting. Preliminary reviewer scores were stated, and then the RAC heard a brief critique from Reviewer #1 and Reviewer #2. Next, there was a general discussion from members on the RAC and then the two reviewers were asked for their updated proposal scores. Once stated to the team, a 0.5 range was established from the score of reviewer #1 and reviewer #2. There was a brief discussion on the proposed budget and then each RAC member put their final score on the score sheet provided. After the meeting, all of the scores from the eight RAC members for each concept proposal were tallied and averaged to get one score per concept proposal. This score was multiplied by 100 to get a final score from 100 (outstanding) to 500 (unacceptable). Any proposal that had an initial score of above 300 from the primary and secondary reviewers was triaged and not scored during the study section.

There were 34 concept proposals received through this process and 10 were not scored at the RAC study section because their initial score from the primary and secondary reviewer was above 300 or were not scored at all because the proposal submitted did not fit the criteria of a program or center. Twenty four proposals were discussed at the RAC study section and scored. The final scores were evenly distributed between the scores of 100-300 and 7 of the proposals received a score below 200.
Besides the scientific criteria that the RAC based their scoring for each concept proposal, there were three other criteria factored in and considered to determine the final research priority areas. These criteria involved other leaders within Children's including the members of the Research Strategic Plan Champion Guiding Team among other leaders at Children's and Emory to help determine the final research priority areas. The other criteria were the following:

- **Balance Between Themes**
  - Are the prioritized research areas within and across the overall research themes?
  - Are we supporting research in a balanced way?

- **Institutional Priorities**
  - Are the prioritized research areas representing Children's current strengths? If concept proposals were not submitted or not strong in key priority areas for Children's, how will these areas be considered and incorporated into the overall plan and identified as priority areas? Do the prioritized areas represent the current affiliations that Children's has with Emory, Georgia Tech and Morehouse? How do the service lines and overall clinical plan fit in to the research priority areas identified?

- **Financial Viability**
  - Is the right number of prioritized areas identified to be able to put a substantial investment in each one? Do some need to be developed earlier in the plan while others pushed out in subsequent years? How does each of the centers start-up in the next 5 years? What is the budget for each proposed center?

**Children's Research Centers**
Considering both the scientific and other criteria, the following were identified as the research priority areas within the established themes. The AFLAC Cancer Center & Blood Disorders Service is the only priority area already existing. The Children’s Center of Excellence in Immunology and Vaccines, Children’s Center for Transplant Immunology & Immune Therapeutics*, Children’s Center for Technology Innovation, Children’s Cystic Fibrosis Center of Excellence, Children’s Center for Developmental Lung Biology, Children’s Center for Endothelial Cell Biology and Children’s Center of Excellence in Cardiovascular Biology* are all new centers and correspond to the seven highest scoring concept proposals. The Children’s Center of Excellence in Drug Discovery, Children’s Center of Excellence in Neurosciences*, Children’s Center of Excellence in Autism Research*, Children’s Center of Excellence in Outcomes &
Wellness* and Children’s Center of Excellence in Clinical and Translational Wellness* are also new and were identified as other key areas that need to be developed early on in the plan. The areas starred above (*) are those in which a new scientific leader needs to be recruited to lead overall research efforts.

Figure 5: New Centers from Concept Proposals

- **AFLAC Cancer Center & Blood Disorders Service**
  The AFLAC Cancer Center & Blood Disorders Service is an existing research center that fits naturally within the new center structure. The AFLAC Cancer Center & Blood Disorders Service has built strong research programs in Sickle Cell, Innovative Therapies, Hemostasis/Thrombosis, Cancer Survivorship, Blood and Marrow Transplant, and Solid Tumors. The AFLAC Cancer Center & Blood Disorders Service has leaders in these programmatic areas, and faculty within this Center has also played important roles in the development of several of the broad, multidisciplinary centers outlined below. The AFLAC Cancer Center & Blood Disorders Service will continue to pursue groundbreaking research in the area of childhood cancers and blood disorders, and will pursue new research initiatives under the leadership of Bill Woods.

- **Children’s Center of Excellence in Immunology and Vaccines**
  This is a new center and falls within the Immunology & Vaccines Theme. This center will leverage existing strengths at area institutions, including the Emory Vaccine Center and the CDC, to build a cross-disciplinary research center for the development of new vaccines and treatments for infectious diseases affecting children. Programmatic research within the CCEIV will include Microbial Pathogenesis and Host-Pathogen Interactions, Innate Immunity, Neonatal/Developmental Immunology, and Primary and Acquired Immunodeficiencies of Childhood, and Clinical Vaccinology. In addition to bringing together investigators with expertise in these areas, major new recruitments will be pursued to build strengths in each of these programs. An Immunology Core Laboratory will be
established that will serve the needs of investigators throughout our research enterprise.

- **Children’s Center for Transplant Immunology & Immune Therapeutics**
  This is a new center that also falls within the Immunology & Vaccines Theme. The CTIIT will facilitate the development of novel immunologic therapies for children undergoing solid organ transplant, bone marrow transplant and those with autoimmune diseases. It will allow Children’s to distinguish itself as a preferred treatment center for children requiring complex immunological and immune-based therapies. This center will focus research efforts on immune tolerance and rejection, bridging from basic immunologic studies to real-life interventions. The Center will develop improved strategies to address chronic rejection and GvHD (graft vs. host disease). Programs in murine and primate models of transplantation tolerance are envisioned. Clinical studies of transplant outcomes and interventions in the pediatric population will be carried out by Center investigators. A flow cytometry core laboratory will be essential to the success of this Center and the CCEIV, and will be available to all investigators throughout the research enterprise.

- **Children’s Center for Technology Innovation**
  This is a new center and falls within the Experimental Technologies and Therapeutics theme. This center will take advantage of strong engineering expertise at Georgia Tech, and will build on existing collaborations between investigators at Tech and surgical faculty in Children’s Craniofacial and Urology Service Lines. The Center for Technology Innovation will develop new techniques, technologies and therapeutics to diagnose, treat and cure diseases and conditions that affect children. Collaborative projects on tissue engineering and regenerative medicine, urologic surgery, cancer diagnosis and therapy, and sickle cell disease are envisioned.

- **Children’s Cystic Fibrosis Center of Excellence**
  This is a new center that crosses a number of research themes. Cystic Fibrosis (CF) is the leading serious genetic disorder in the Caucasian population, and Children’s Healthcare of Atlanta and Emory University share the largest pediatric CF clinic in the nation. This center will focus research efforts on developing new therapies, drugs and new devices that improve the quality and longevity of the lives of CF patients. This Center will address all three components of the triad of CF lung disease: inflammation, infection and epithelial transport. Programs will range from basic research on the underlying pathogenesis of CF to outcomes research defining the best treatment and prevention regimens for this group of children and young adults. Specific programs in CF-associated diabetes, the role of oxidative stress on pulmonary pathology in the CF lung, and airway ecology of the CF lung are envisioned.

- **Children’s Center for Developmental Lung Biology**
  This is a new center and falls within the Vascular Biology theme. This center would focus research efforts on the impact of chronic oxidative stress in the pathologies associated with the developing lung. This center would examine the mechanisms by which chronic pulmonary oxidative stress exacerbates pediatric pulmonary pathologies, develop potential biomarkers in the exhaled breath or tracheal aspirate that will lead to early identification of patients with chronic pulmonary oxidative stress as well as biomarkers that can be used to monitor disease management and develop therapeutic strategies to reduce pulmonary oxidative stress and risk of lung injury.
- Children’s Center for Endothelial Cell Biology
  This is a new center and falls within the Vascular Biology theme. This center would focus research efforts to identify and clinically validate innate endothelial defenses that can be developed as therapeutic strategies to augment endothelial barrier function in children exposed to disparate acquired, genetic and treatment-induced insults.

- Children’s Center of Excellence in Cardiovascular Biology
  This is a new center and falls within the Vascular Biology theme. This center will focus research efforts on examining unique aspects of cardiac disorders in the young to reduce the morbidity of pediatric heart disease. Within the Cardiovascular Biology Center, the following will be programs: Cardiac Imaging, Cardiac Development, Cardiac Failure, Genetic Determinants of Cardiac Outcomes and Cardiac Neuroprotection.

Figure 6: Other New Centers for Development

- Children’s Center of Excellence in Drug Discovery
  This is a new center that will be led by Dr. Raymond Schinazi, PhD which falls naturally within the Experimental Technologies and Therapeutics Theme. The focus of the Center will be on the discovery of new drugs for infectious diseases afflicting children, inflammatory conditions of childhood, and childhood cancers and blood disorders. The Vision for the Center is being drafted at present, along with more detailed plans for developing a world-class drug discovery endeavor.

- Children’s Center of Excellence in Neurosciences
  The Children’s Center of Excellence in Neuroscience Research does not yet have a specific plan, but represents a recognized important need within the research enterprise. A new leader in neurosciences research will be recruited, and this leader’s vision will become the basis of the new Center plan.
Researchers Strategic Plan

- **Children’s Center of Excellence in Autism Research**
  Autism research is a top priority of Children's Healthcare of Atlanta, Emory University, Georgia Tech, and other affiliated institutions. A major research center focused on identifying the underlying causes of autism spectrum disorders and on effective treatments and behavioral interventions is envisioned. Specific projects in this center remain to be determined, and are dependent upon the recruitment of a leader for this Center.

- **Children’s Center of Excellence in Outcomes & Wellness**
  This is a new center and would fall under the Clinical Outcomes and Public Health theme. This center will centralize and coordinate outcomes and epidemiologic research throughout the system, emphasizing strong ties to the Rollins School of Public Health at Emory University and to the Centers for Disease Control. The Center will synergize with Children’s plans for new wellness initiatives impacting the health of Georgia’s children. An area of emphasis will be obesity and programs to combat the present obesity epidemic. Additional programs in this initiative will be laid out by a new leader (to be recruited).

- **Children’s Center of Excellence in Clinical and Translational Research**
  This is a new center that will organize and provide leadership in clinical trials science across Children’s Healthcare of Atlanta. The Center will integrate closely with the Atlanta Clinical and Translational Science Institute, an NIH/NCRR-sponsored component of the CTSA network, and will represent the pediatric component of the ACTSI. The Center will serve as a recruitment center for outstanding clinical trialists in a variety of disciplines, and will also provide a scientific home for leaders in nursing research. This Center is also in need of a new senior leader, to be recruited as a high priority in the early years of implementation of the Research Strategic Plan. Programs in this initiative will be Bioinformatics, Statistical Services Core, Research Nursing and Coordination Support, Research Processing Lab and Central Biorepository.

**Children’s Research Infrastructure**

The planning process validated that there will need to be a large investment in research infrastructure over the next several years to grow research and to be able to reach our 2018 vision. This includes building and growing centralized core resources to be made available to all pediatric researchers. Planning has been ongoing around two basic categories of cores: General Resource Cores and Specialized Cores. General Resource Cores will be generally applicable to a wide variety of research disciplines and fulfill a fundamental resource need for investigators throughout the research enterprise. Specialized Cores may be more theme- or center-specific, serving a smaller cadre of investigators while being open and available to all. The following System-Wide Cores have been identified in the planning process: Flow Cytometry Core, Cell Imaging Core, Histology/Equipment Core, Biostatistical Core, and a Specimen Repository. The following Specialized Cores have been suggested from Center Proposals: Immunology Core, Primate Colony Core, Microsurgery Core, Endothelial Cell Core, Biomarker Core.

**General Resource Cores**

- **Flow Cytometry Core**
  The Flow Cytometry core facility will provide the equipment and technical expertise to perform immunologic assays for investigators at Children's and affiliated institutions. A technician will need to be hired to perform ELISPOT, specimen preparation, and develop flow-based assays not available through the clinical laboratories.
The following equipment is available and will be centrally located within this core: BD FACSCanto flow cytometer, BD LSRII flow cytometer, BD FACSARia cell sorter, Zeiss automated ELISPOT reader, a Nanodrop spectrophotometer, and an Applied Biosystems plate-based real-time PCR machine. New equipment that will need to be purchased for this core includes the following: Miltenyi AutoMACS Pro automated magnetic bead-based separator, Luminex 200 multiplex bead array system, small equipment and tabletop centrifuges for specimen processing and Baker 4-ft biosafety cabinet for clinical specimen preparation.

- **Cell Imaging Core**
  The Cell Imaging core facility will provide the equipment and technical expertise allowing investigators access to cutting-edge cellular imaging technologies. The Core will include the following initial instrumentation: A scanning laser confocal microscope with TIRFM capability for analysis of fixed or living cells and tissues, and an epifluorescent microscope for standard (non-confocal) slide imaging. In addition, with proper training and supervision the core will provide access to advanced live cell imaging systems available in ECC, including a Deltavision live cell imaging station for deconvolution microscopy and a spinning disk confocal live cell imaging station for rapid image acquisition. Additional instrumentation will be sought through proposed collaborations with the Winship Cancer Institute Cell Imaging Core Facility. A technician will be hired to manage the daily operations and to oversee the technical logistics of this core.

- **Histology/Equipment Core**
  The Histology/Equipment core facility will provide the equipment required for standard gel and blot imaging, high-speed centrifugation, ultracentrifugation, image quantitation, film processing, real-time PCR, preparation of histologic specimens, and digital imaging of histologic specimens. A technician will oversee this core, which will not be a service core in the sense of preparing specimens but can train students and staff in laboratories on the proper techniques.

- **Biostatistical Core**
  The Biostatistical Core will provide access to a PhD-level biostatistician and a data analyst experienced in the design of databases. The primary mission of the Core will be to assist investigators in statistical methods and applications required for grant submission, together with a secondary responsibility for analytical help used in the preparation of manuscripts. More advanced, ongoing, or involved biostatistical help can be accessed through the Core but will require ongoing financial input from the investigator or team. The Core will serve as a means for investigators to access appropriate specialized statistical personnel in Rollins School of Public Health. Assistance in the design of simple databases will be provided, while data entry assistance will not be provided. It is envisioned that over time this resource will expand and become a central resource directed by the leadership of the Outcomes/Wellness Center.

- **Specimen Repository**
  The Specimen Repository will allow for the processing, storage, distribution and clinical correlation of biological samples such as blood, tissues, and biological fluids critical for mechanistic evaluation of new clinical therapies. It will provide for appropriate attention to patient confidentiality by merging clinical consent information with specimen storage.

  The Repository will be managed by the leader of the Center for Clinical and Translational Research, and directed on a daily basis by a senior technical director.
Resources are being sought currently to allow the purchase of a variety of storage media and freezers, including liquid nitrogen storage, -80 degree freezers, and -20 degree freezers. The Repository will centralize wherever practical the variety of specimen storage activities across the research enterprise. A LIMS system is under evaluation for its utility in monitoring and retrieval of specimens.

**Specialized Cores**

- **Immunology Core**
  
  This Core is linked to the Children’s Center of Excellence in Vaccines and Immunology Center and the Children’s Center for Transplant Immunology and Immune Therapeutics. The Core will develop and make available immunologic assays for the use of researchers and clinicians throughout the research enterprise, including ELISPOT assays, intracellular cytokine staining, luminex multiplex bead array for detection of cytokines, ELISA for antibody quantitation, and other assays. The core will have a dedicated Scientific Director who overlaps with the mission of the Emory Vaccine and Treatment Evaluation Unit (VTEU), and who can develop novel assays for investigators. The Core will also serve as the Immunology Core Laboratory for the Jeffrey Modell Diagnostic Center for Primary Immunodeficiencies, and will provide clinically-relevant diagnostic laboratory assays for this specialized population.

- **Primate Colony Core**
  
  This core is under discussion, as part of the Children’s Center for Transplant Immunology & Immune Therapeutics. The core would create an MHC-defined Rhesus macaque colony at Yerkes with approximately 53 founder animals (30 mating dams, 3 mating sires and 20 offspring). This colony will have an initial investment cost and a yearly maintenance cost. This will be a unique resource for the overall research enterprise. A technician will need to be hired to be responsible for daily animal husbandry assessment of all animals within the colony, for accessing animals in order to draw blood or obtain tissues for genetic and immune analysis and for basic hematologic and immunologic analysis of the colony.

- **Microsurgery Core**
  
  This Core is linked to the Children’s Center for Cardiovascular Biology. This core will be a centralized resource specializing in survival surgery for rats and mice in addition to USDA regulated animals such as rabbits, guinea pigs and piglets. Dedicated surgical space is required for the latter group of animals and more stringent regulations are in place to manage the complexities of survival surgery in general. Due to these extra requirements and the more rigorous IACUC guidelines, a Microsurgery Core facility will allow researchers ready and available access to these powerful animal models that are often essential in the translational research progression.

  Each investigator will be required to purchase his/her own animals, pay for associated housing and develop appropriate protocols and apply for individual IACUC approval. A Core technician will be hired to consult and provide input on animal protocols and to facilitate IACUC requests for approval. This technician will also then carry-out the actual surgeries including but not limited to aortic banding, pulmonary banding, lobectomies and transplant related animal experiments.

  New equipment that will need to be purchased for this core includes the following: Dissecting microscope, Respirator, BP, temp and Respiratory Monitoring, Anesthesia and Analgesia and Supplies.
- Endothelial Cell Core -
The Endothelial Cell Core facility will provide the equipment and technical expertise to provide endothelial cell isolation, culture and barrier function service to investigators. A technician will need to be hired and trained to isolate endothelial cells from multiple types and unique vascular beds. The technician will routinely isolate, culture and perform basic functional analysis on endothelial cells from a diversity of vascular beds. These functionally characterized cells can then be issued to meet a variety of research needs.

New equipment that will need to be purchased for this core includes the following: MACS Quant Cell Analyzer, MACs Beads, Biological Safety Cabinet and Incubator, Endothelial Core Reagents, Liquid Nitrogen Cell Cryopreservation System, ECIS System, and Arrays for EC Barrier Function

- Biomarker Core -
The Biomarkers Core facility will provide the equipment and technical expertise to assay samples using methods that combine the features of gas-liquid chromatography and mass spectrometry. These core services are applicable to a wide variety of sample types and will allow small-molecule metabolite profile identification. This is a very powerful basic science technique that facilitates important discoveries including detecting and defining the physiological changes related to specific disease states. This gas chromatography/mass spectrometry equipment will be used within the Children’s Center of Developmental Lung Biology to define and develop biomarkers in exhaled breath condensate and tracheal aspirate that will serve as identifiers of disease maintenance or progression. Many other applications are envisioned that will be relevant to a variety of disease states.

A technician will need to be hired to develop appropriate protocols, maintain the equipment and run the samples to capture the metabolomic profiles.

New equipment that will need to be purchased for this core includes the following:
Gas chromatograph/mass spectrometry instrument

In 2010, besides developing and implementing the laboratory cores, research administration plans to centralize all clinical research support staff at Children’s and in the DOP. This will allow for synergies and economies of scale and will prevent duplication of efforts. Centralization of both the grants administrative staff and the Research nursing/coordinator staff is planned. Centralization of the research nurse/coordinator staff will allow for greater flexibility and the ability to grow incrementally meeting the needs of the investigator.

- Metrics of Success -
The following metrics of success will help measure research progress and will see if Children’s is on track to meet the Research 2018 Vision. These metrics are for the entire research enterprise and align with the overall research goal and the assumptions in the Research Vision 2018 financial model.

- Pre-Eminence -
NIH Combined List Rank (# & $’s)
Peer Review Publications (#)
National Leadership Positions
  - Study Section Leadership, Professional Society Chairs, Journal Editors
US News & World Report Rankings
Research Strategic Plan

- **Extramural Funding**
  - Total Grant Funding (% and $’s)
  - NIH Federal Grant Funding (% and $’s)
  - Non-NIH Federal Grant Funding (% and $’s)
  - Non Federal Grant Funding (% and $’s)
  - Overall Indirect Cost Recovery Rate (%)

- **Primary Investigators**
  - New Recruits (FTE)
  - PI’s with NIH as Primary Funding Source (FTE)
  - Total PI’s (FTE)
  - Patents (#)
  - Inventions Commercialized (#)

- **Facility**
  - Extramural Funding per Square Foot ($)
  - Direct & Indirect Funding per Square Foot ($)
  - Total Research Space (square feet)

Centers will be reviewed on an annual basis for evidence of success, to determine whether they have achieved their goals. Well-planned progress reports will be of great value in providing records of accomplishments that serve as a basis for continued support of the project. Furthermore, progress reports provide information to awarding component staff that is essential in the assessment of changes in scope or research objectives from those actually funded. They are also an important information source for the awarding component staff in preparing annual reports, in planning programs, and in communicating scientific accomplishments to the public and to the Executive Team. Center Scientific Directors will provide yearly updates for evaluation.

**Critical Success Factors**
In order to be successful in the overall implementation of the research strategic plan, several critical success factors were identified and are crucial to Children’s success. These critical success factors represent capabilities that will provide a competitive advantage for Children’s.

- Creation of research phase II strategic plan
- Adoption of research strategic plan that links to Children’s clinical, teaching and wellness strategic focus area plans as well as affiliate research strategic plans
- Affiliations with academic institutions
- Recruitment & retention of star investigators
- Optimal space plan with dedicated research space
- Achievement of extramural funding at 75%
- Investment in plan by key affiliates and donors

**Operating Strategies**
In addition to identifying overall critical success factors, operating strategies were identified for the following areas: prioritization & investment, financial, leveraging relationships, recruitment and structure and governance. They represent guidelines that Children’s will try and adhere to or are specific actionable tasks that will be completed through the implementation of the Phase II research strategic plan.

**Operating Strategies: Prioritization & Investment**
- Research investment will only fund activities that will aid towards the achievement of established metrics
We will invest in programs/centers that link to Children's clinical, teaching and wellness strategic focus area plans as well as affiliate research strategic plans.

Research funds will not be utilized to provide clinical stabilization or sustain unsuccessful programs or investigators.

Investment will be made in high quality scientific endeavors and will be subject to external review.

We will have a diversified research portfolio (basic vs. translational vs. clinical, etc.) to maximize funding opportunities (competitive, donor) thus maximizing revenue.

**Operating Strategies: Financial**

- We will develop and maintain a sustainable financial model for research.
- 75% extramurally funded by year 5.
- 67% of total funding will be NIH funding.

**Operating Strategies: Leveraging Relationships**

- Children's investment will leverage extramural and affiliate investments to include but not limited to Emory, Georgia Tech, Georgia Research Alliance and others.
- We will develop a joint fundraising plan with Emory and others.
- We will develop a branding plan with Emory and others to create an entity that has national recognition between Children’s and it’s research academic affiliates.
- We will identify and build research space to allow for anticipated growth.

**Operating Strategies: Recruitment**

- We will primarily recruit mid level to senior funded researchers.
- We will adhere to average recruitment package of $2 million over 4 years spent at the rate of 40% in the first year followed by 20% in years 2-4.
- We will collaboratively recruit with other departments and institutions with the following requirements:
  - Joint appointment in the DOP.
  - NIH submissions/awards credited to DOP.
- We will not allocate 100% of the research vision endowment dollars and develop a process to approve unplanned recruitment opportunities outside of the identified priority areas:
  - Mission critical.
  - Reputational recruits.
- We will grow to 69 Primary Investigators (PI's) by 2018.
- We will fund and create a Research Scholars Reward Program that supports RO1 funded investigators by providing ongoing support of 50% of their salary.

**Operating Strategies: Structure and Governance**

- We will develop a structure and governance model that will optimize financial, recruitment and leveraging strategies.
- We will create an External Scientific Advisory Board (ESAB) for Children’s Healthcare of Atlanta research enterprise composed of five experts in child health research, from major research institutions not affiliated with Children's.

The ESAB will provide objective, critical review of the programs supported through Research Vision Endowment funds. The ESAB will meet in Atlanta one time per year and formal presentations will be organized by the CRO, and will feature leaders of the Research Department, Centers, and other research leaders or programs receiving support through the Research Vision Endowment funds. The ESAB will elect a Chair who will be responsible for compiling a report at the conclusion of the one day meeting. The ESAB members will be requested to serve...
Research Strategic Plan

- a 5 year term. Nominations will be taken from the Academic Council and others; invitations will be extended by the CRO or the Emory DOP Department Chair.

The ESAB will have the following objectives:
- To provide ongoing criticism and advice for the Research Strategic Plan and those charged with its implementation, including the Chief Research Officer, the Academic Council, and the Executive Team
- To critique the success of programs currently supported under the Plan
- To recommend changes in direction or allocation of resources where necessary
- To provide critical input on operational issues that enhance or inhibit the success of the research enterprise

Financial

The Space & Packages Champion Guiding Team worked with Jacobs Consultancy to determine the research space and package investment requirement for 2014 and 2018. This team helped finalize the assumptions used in driving the Research Vision 2018 financial model.

The financial model was developed through a ‘top down’ methodology to identify the funding necessary to be ranked as a Top 10 recipient of NIH funding by 2018. By applying numerous assumptions regarding percent NIH funding to other funding, investigator productivity, indirect cost rates, recruitment packages, spend rates and productivity ramp ups, square feet required per investigator, and other construction estimates, etc. the model developed an enterprise investment value. This value, in summary, identifies the number of researchers and the financial resources necessary to recruit, support and house the researchers required to reach a Top 10 NIH ranking.

Vision 2018 Financial Model Assumptions
Further explanation of key assumptions is provided below.

Extramural Funding
- In 2008, a Top 10 ranked NIH pediatric research program received $17M in NIH funding. By assuming a 5% Compound Annual Growth Rate (CAGR), a Top 10 program by 2018 will need to receive nearly $28M in NIH funding.
- Another assumption is that NIH funding will represent 66% of total extramural funding by 2018; therefore, $42M$ in total extramural funding will be required by 2018. Extramural funding is awarded to Principle Investigators (PIs). Each PI is assumed to have a productivity of the equivalent of 1.5 ROI NIH grants. An ROI grant is valued at $375,000 per year; therefore, PI annual productivity is estimated at $563,000, including direct and indirect costs. This target is set to provide 75% extramural funding with the remaining 25% to be provided through intramural funds.
- New PIs have an extramural funding ramp up for their annual $563,000 target: 25% in Year 1, 50% in Year 2, 75% in Year 3, 100% in Year 4
- The overall research program will be 75% extramurally funded by year 5
- Current DOP investigators will be 75% extramurally funded by 2012
- The total grant awarded is comprised of two components: direct costs and indirect costs. Direct costs include labor, supplies, and equipment directly associated with the research; indirect costs are considered overhead and include administration, facilities, etc. NIH

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$42M represents total extramural funding required by 2018 with $28M from the NIH (66% of total). The $42M reflects that there is constant growth and the current and new investigators are not at full capacity or 75% extramurally funded. When the new recruits and infrastructure are producing at full capacity they will have the potential to receive $76M in revenue with $50M from the NIH.
Research Strategic Plan

Grants typically provide the highest indirect cost rate (IDC) indicating the importance of achieving a greater share of NIH funded research over non-NIH funded research. The IDC rates used in the model were as follows: NIH – 35-51%; Non-NIH – 20%. The blended average IDC in 2018 is 39%. The NIH IDC is determined by periodic review and location of NIH funded research. Efforts will be implemented to ensure the highest possible IDC can be achieved for NIH funded research related to the pediatric enterprise.

**Primary Investigators**
- The general methodology of the model is to project a top line revenue target and divide by annual productivity to determine the number of PIs necessary to support this target. The result of the model produced the need for 69 full time equivalent (FTE) investigators. By using a PI definition as an investigator with significant NIH funding, there are 27 PIs within the DOP today; therefore, an additional 42 investigators will be necessary to meet the Top 10 ranking target.
- The average recruitment package for each PI was estimated at $2,000,000 with a spend rate over four years: Year 1 – 40%; Years 2-4 – 20% each. There is a 5% inflation rate for recruitment packages.

**Facility**
- With regards to space requirements, another assumption is that each PI requires 1,500 net square feet space to house their research teams.
- The net space required is grossed up by 35% to reflect circulation, common space & mixed-use inefficiencies.
- An additional 14,000 net square feet were identified for the Drug Discover Lab adding approximately 20,000 gross square feet to the total research need.
- Total new gross square feet required is approximately 115,000
- Cost per square foot = $575
- Construction Cost Inflation = 3.5%
- Total construction costs = $68M
- Total Extramural Funding per Square Foot (2018) = $408; Indirect = $110; Direct = $287
- Annual capital expenditures for equipment = $750,000

**Figure 7: Vision 2018 Top 10**

Figure 7 above displays the road to achieving a Top 10 NIH ranking and the growth in PIs and space necessary to produce the NIH and Total Grant Revenue targets.
Research Strategic Plan

**Top 30 Ranking**
In late 2004, Children’s and Emory made a joint commitment towards pediatric research. Over the last five years Emory and Children’s have, along with donors, invested $90M in research, split equally between researchers and space. This initial investment built a solid foundation and was the first leap towards pediatric pre-eminence. During this time, the annual grant revenue reached $21M, of which $11M is from the NIH, elevating Emory’s DOP to a Top 30 NIH Ranking. Total number of investigators are 70 with 27 of these classified as NIH funded investigators. The pediatric research facility includes 102,000 gross square feet, or approximately 70% of the Egleseton Children’s Center (ECC). This space includes vivarium and lab space, offices, mechanical and circulation.

**Top 20 Ranking**
A Top 20 NIH ranking will require $180M to support and recruit researchers and provide their research space. Approximately $140M will be spent to recruit and sustain investigators and $40M on space and equipment. It is expected that the investment will be greater for recruiting star investigators as these recruits will be more established in their fields and will be joining the DOP with extramural funding. An additional 61,000 gross square feet is estimated to house new recruits and the Drug Discovery Lab. This leap should position the research enterprise in the Top 20 by focusing our recruitment efforts on star investigators, increasing our NIH grant revenues. Again at a state of full productivity, existing and new PIs recruited during this stage will have capacity to produce $50M in grant revenue, of which 66% or $33M will be NIH revenue.

**Top 10**
A Top 10 NIH ranking will require an additional $170M to drive Children’s towards Vision 2018. Seventy five percent or $135M will be spent to recruit new investigators with $35M invested in an additional 54,000 gross square feet and equipment. In total, 115,000 additional square feet is required for this Plan. Emory has identified an on-campus site adjacent to the ECC for the new facility. Known as the Turman site, Children’s and Emory have been working closely to maximize the utilization of this site, including 115,000 square feet for the DOP and other university uses. When the existing and new investigators are producing at full capacity (i.e. beyond ramp up years) they will have the ability to generate $76M in total extramural funding with 66% or $50M coming from the NIH.

In summary, to reach Vision 2018, Children’s will maximize the overall opportunity and leverage the vast capabilities, infrastructure and commitment from Emory, Georgia Tech and other affiliates. Success requires a large financial investment and the collective ability to recruit many star investigators to the research enterprise. The recruitment goal is 42 new investigators by 2018. About 115,000 additional gross square feet will be needed to accommodate the new researchers and their activities.

**Investment Required: 2014 and 2018**
By taking these leaps displayed in Table 8 below, the overall investment required to reach Vision 2018 is $350M over the next 9 years: $275M will be used to recruit top investigators to the State, aligning with the overall goal to increase Georgia’s and Atlanta’s profile in research; and $75M will be used for additional facilities and equipment. Children’s and Emory working together identified sources to fund about half of this overall need or $175M. Sources include: Children’s investment, existing philanthropy (primarily from Aflac) and Emory-designated funding. In July 2009, the Children’s Trustees approved the commitment of $75M from the endowment to be allocated to the research enterprise over the next five years (2009-2013).
In order to achieve this vision, an additional $175M must be identified from other funding sources that may include joint fundraising, investments from other academic affiliates, additional intellectual property monetization, and aggressively pursuing grant opportunities. Recently, Children’s applied for $15M CO6 grant from the NIH that if awarded will be available for the research space needs in the plan.
Research Strategic Plan

Implementation Plan

There are many next steps that will be completed in the remainder of 2009 thru 2010 to keep the research enterprise on track to become a Top 10 program by 2018. In the fourth quarter of 2009, it will be important to finalize the 2010 budget and allocate vision endowment funding. It will also be important to develop a financial reporting model and to finalize the metrics and scorecard. This will ensure that key metrics are measured to track the overall progress of the research enterprise.

Throughout the next year, it will also be important to continue to maintain and improve our relationships with key academic affiliates; Emory, Georgia Tech and Morehouse, as well as others that include CDC, Georgia Research Alliance, etc.

More detailed operational plans will be completed next year to support achievement of Phase II. It will be important to develop a detailed recruiting plan that shows timing and description of key star recruitments. It will also be crucial to develop a space optimization plan to transition from our current research space to new space as the research enterprise grows. Other detailed plans will include a fundraising plan with Emory to leverage extramural investments and affiliate investments, develop an optimized research infrastructure plan and develop the individual pediatric research center strategic plans.

In 2010, it will also be important to implement the structure and governance model for the research enterprise, implement the External Scientific Advisory Board (ESAB) so that the first meeting can take place in 2010 and develop the core lab business model to ensure new cores can run efficiently and will be financially solvent over time.

Table 10: Research Implementation Plan
Conclusion

Researchers at Children's and Emory, along with other academic affiliates, seek answers to the most complex childhood medical conditions with two goals in mind: discovery and integration. Through translational research – bringing new discoveries from bench to bedside – Children's provides leading-edge care to the patients and creates an innovative environment for the physicians.

According to NACHRI (National Association of Children’s Hospitals and Related Institutions), Children’s and the DOP jointly rank 41st in NIH (National Institutes of Health) funding. The NIH rank is a key measure of success for a research enterprise and DOP. So, although Children’s is a leader clinically, there is much progress to be made in research.

Children’s is a young organization compared to other top pediatric hospitals in the nation, yet there is a significant opportunity to advance research and teaching through the close affiliation with Emory University’s DOP. Children’s and Emory have developed a joint research plan that will leverage vast capabilities and resources between organizations and other key affiliates in the metro Atlanta area in order to accelerate Children’s and the DOP to a top 10 ranking in terms of NIH funding.

Through Phase II of strategic planning for research the research themes were validated, goals were established for the research enterprise and priority areas were identified for initial investment. The research plan focuses on investments in priority centers which not only leverage existing strengths and capabilities at both Children’s and Emory, but also align with the overall strategy to become a pediatric center of excellence.

A total investment required of $350 million is estimated for research, which consists of $275 million in support for recruiting and sustaining researchers and $75 million for a new pediatric research building on Emory’s campus. Approximately one-half of the funding needed has been identified already through Children’s investment, existing philanthropy (primarily from Aflac) and Emory-designated funding. The outstanding $175M will be identified through other potential funding sources.

Critical next steps will be the implementation of the strategic plan. Specifically this includes developing the overall 2010 budget, recruiting star investigators and identifying new space as the overall research enterprise grows. In the past year, the plan has been crystallized, and the stage has been set for tremendous research growth. Through the united vision of the strong leadership at Children’s, Emory, and other local, regional, and statewide institutions, the Research Strategic Plan is ready for implementation, and the goals of Vision 2018 are within reach.

An important aspect of this plan is its fluidity, providing structure to the research endeavor without rigidity. When new findings and new breakthroughs occur, the plan is poised to adapt and shift resources appropriately. As such, the plan intentionally is designed to accommodate modifications according to the principles outlined in this document. In summary, the Research Strategic Plan provides a well-thought blueprint for our research growth for the future, allowing Children’s Healthcare of Atlanta and all affiliated institutions to join the top ranks of child health-oriented research enterprises while focusing on the major mission of enhancing the lives of children.
Glossary of Terms

Strategic

- **Mission Statement**: A mission statement is a brief description of a company’s fundamental purpose. A mission statement answers the question, “Why do we exist?” The mission statement articulates the company’s purpose both for those in the organization and for the public. **Children’s Mission**: To enhance the lives of Children through excellence in patient care, research and education

- **Vision Statement**: The vision defines where the organization wants to be in the future. It reflects the optimistic view of the organization’s future. It is an expression of hope. It is a description of what the organization will be like and look like when it is fulfilling its purpose. **Children’s Vision**: To transform pediatric healthcare and be the leading voice for the health of Georgia’s children. **Research Vision 2018 Statement**: To improve the health of children through innovation and excellence in research

- **Values**: Values are the principles that guide decision making and are held dear by members of the organization. Values are the things organizations stand for—the fundamental principles that, along with the mission, make an organization unique. Most often, discussions of organizational values relate to ethical behavior and socially responsible decision making. **Children’s Values**: Integrity, Respect, Nurturing, Excellence, Teamwork

- **Initiatives/Strategies**: Actions that describe “how” we will achieve our objective; they usually span more than one year. Should be short and specific

- **Goals**: Goals to achieve objective and strategies broken down into yearly increments. Should be SMART – specific, measurable, achievable, realistic and time bound

- **Measures of Success/Metrics**: Specific measures to achieve each year that tie back to annual goals. Measures of success should be quantifiable measurements and help the organization define and measure progress towards the overall goals.

- **Objective**: Description that provides a picture of the service and guides the choices that determine the direction of the program

- **Guiding Principles**: The fundamental beliefs that guide the operation of a program. Common set of values and principles that will guide our work. Helps to guide the future – may include what we will and won’t do, deal breakers, boundaries, scope, etc.

- **Critical Success Factors**: Identification of a few key factors or areas that organizations should focus on to be successful. Elements that are necessary for a strategy to be successful. Should describe what we need to have in place to be successful – may include relationships, resources, organizational structure, etc.

Financial

- **Sustainability Current PIs**: funding required to maintain the existing PI’s

- **Sustainability New PIs**: funding required to maintain the new PI’s

- **Sustainability**: component of total enterprise expense related to the ‘gap’ not extramurally funded

- **Infrastructure**: funds required at DOP and Children’s for administration, IRB, infrastructure, etc.

- **Other Emory Sustainability**: Children’s funded research efforts (pathology, neurosciences, transplant) with Emory departments other than the DOP

- **Recruitment**: funds required for recruitment packages for new recruits

- **Building**: cost of research facility; includes Schinazi space

- **Routine Capital**: assumed annual capital expenditures for equipment

- **Extramural Funding**: sources external to Emory or Children’s and which are deemed competitively won, ex. NIH, March of Dimes, Department of Pediatrics
share of Indirect Cost Return, other federal/non-federal agencies, philanthropy, restricted funds, industry sponsors, royalty/licensing

- **Intramural Funding**: sources internal to Emory or Children’s, ex. School of Medicine, Vision Endowment Funds/Spending Policy, internal grants
- **Direct Cost**: costs directly associated with research (salary support, supplies, lab fees, etc.)
- **Indirect Cost**: costs related to administrative and facility overhead applied as a % of Direct Cost
- **Baseline**: existing research at DOP & Children’s
- **New Growth**: additional research produced by future investment
- **Productivity Target**: expectation for research to achieve percentage of extramural funding towards total enterprise expense
- **Principal Investigator**: researcher with at least 1 NIH RO1 grant or equivalent
- **Packages**: expense related to recruitment of new investigators
- **Assigned Square Feet**: bench space plus their portion of shared space for lab based investigators

**Scientific**

- **Publication**: Peer reviewed in a scholarly journal (i.e. searchable in pub med)
- **Impact on health of children or adolescents**: diseases, disorders, or conditions that impact the health of children or adolescents is meant to designate those entities that cause significant, measurable morbidity or mortality in pediatric populations (here defined as age 0-21 years) or that promote health in the same populations
- **Fundamental new knowledge**: New discoveries that may be in the basic or translational sciences. Fundamental new knowledge implies that findings are not incremental, confirmatory, or supportive in nature, but rather break new ground
# Appendix A: Physician Involvement in Research Strategic Plan Phase II

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**Note:** List does not represent comprehensive list of all physician input/involvement. Represents where physicians were asked to participate.
Appendix B: Research Strategic Elements and RAC Guiding Principles

Vision:
We will improve the health of children through the performance of innovative research, driving the creation and dissemination of new knowledge. The research enterprise will gain national and international recognition as a top-tier pediatric research program, facilitating the clinical and educational missions through enhancing access to innovative treatments and recruitment of outstanding trainees.

Brief vision statement: To enhance the health of children through innovation and excellence in research.

Objective:
Our primary objective is to contribute to the prevention and treatment of diseases that harm children. We will do this by addressing specific research questions organized under broad, multidisciplinary research themes outlined below.

Research Themes: We will attack basic research questions impacting the health of children and contribute fundamental new knowledge relevant to a variety of disciplines. We will contribute in a substantial manner to the treatment and prevention of diseases of children by translating new therapies into clinical use. The research agenda will be organized according to the following cross-disciplinary themes:

   a. Microbial Pathogenesis, Immunology and Vaccines
   b. Experimental Technologies and Therapeutics
   c. Genetics and Developmental Biology
   d. Vascular Biology
   e. Clinical Outcomes and Public Health

Specific goals:
1) To enhance the research profile of Children’s Healthcare of Atlanta at the national and international level through publications, presentations, grants, and inventions.
2) To provide a user-friendly and efficient clinical research infrastructure available to investigators throughout the Children’s Healthcare of Atlanta hospitals, clinics, and community.
3) To build on a growing partnership with Emory University by creating a top ten Department of Pediatrics by 2018.
4) To enhance collaborations with Georgia Tech, focusing on strengths in the development of biomedical engineering and computing solutions for child health applications.
5) To build research ties and facilitate clinical and community-based research with Morehouse School of Medicine.

Principles: The following principles will be used in the strategic planning process by the Research Advisory Council (RAC), and are outlined here to enhance clarity, transparency, and to provide guidance in resource allocation recommendations.

Principle #1: Respect for all parties engaged in the process
We recognize at the outset that this process involves a large number of individuals affiliated with different institutions, service lines, divisions, areas of research, hospitals, and other affiliations. We agree to respect all investigators and stakeholders engaged in the process, to listen respectfully to each other’s opinions and positions, and to always engage in civil discourse. Furthermore, we recognize that decisions will be made according to the goals of the overall research strategic plan and mission, that resource allocations may not always be popular in each individual area, and that we will continue to work positively toward our goals even if along the way we disagree.
**Principle #2: We should invest only in high quality scientific endeavors, subject to external review, and programs should meet metrics of performance**

We will seek to identify opportunities for high impact science relevant to child health, and will work in areas that are critiqued regularly by external reviewers. We believe that peer review is the standard by which scientific merit should be assessed, and that programs should be reviewed according to defined metrics on at least an annual basis. Measures of success for research programs will be detailed separately, but include NIH funding, other extramural funding, publications in peer-reviewed journals, and products or intellectual property.

**Principle #3: Research Programs should seek extramural funding and financial independence**

Vision endowment funds for research will be used to stimulate the growth of programs with a clear plan for obtaining and sustaining extramural funding. A plan for extramural funding will be required before allocation of these funds for programmatic research. Philanthropic support for programs to provide ongoing discretionary/developmental funds is desirable, and will be part of the planning process.

**Principle #4: Significant investment in research infrastructure is needed**

Infrastructure to support all research efforts affiliated with Children’s Healthcare of Atlanta is currently insufficient and will need ongoing investment. Infrastructure needs include enhanced clinical trials resources to enable preparation and submission of clinical protocols, new clinical research space, database assistance, biostatistical and bioinformatics support, personnel to assist investigators in identifying and applying for funding opportunities, advanced computing applications for research, basic science equipment cores and service centers, and other support needs that are accessible by all investigators. A sustainability plan for investigators, allowing for a competitive level of salary support and discretionary funding, is considered an essential component of research infrastructure.

**Principle #5: Funding of Students, Postdoctoral Fellows, Cores, and Pilot Projects should be supported through a centralized competitive model.**

The Emory-Egleston Children’s Research Center is supported by funding from Children’s and Emory University to promote child health research. The EECRC model has successfully funded pilot projects generating significant amounts of extramural support. This successful model should be continued and expanded. Although the role of the EECRC itself is under discussion, the principle is that a jointly funded mechanism for competitive funding of postdocs, students, and pilot projects supporting investigators in Children’s and affiliated investigators at Emory, Georgia Tech, and Morehouse should be supported. Cores should be supported and managed through this model. Cores will have a financial plan but will require ongoing supplementation to succeed in promoting research advances. Cores will be open to all Children’s affiliated investigators.

**Principle #6: Evaluation of Concept Proposals**

Investigators interested in leading programmatic research efforts are encouraged to submit concept proposals for review. Concept proposal instructions are available on the public website. Proposals will be evaluated for significance to child health, presence and qualifications of a strong advocate or champion, the innovation involved and the uniqueness of the opportunity addressed by a program or center, the plan for extramural funding, and the ability to leverage existing strengths and priorities of Children’s and affiliated institutions. Evaluation of concept proposals will be performed by the CRO, the RAC, and Children’s leadership. Advocates for proposals of great interest will be asked to present to the RAC and potentially to other groups at Children’s and may be asked for additional information prior to prioritization and resource allocation.

**Principle #7: Opportunity packages**

We recognize that opportunities to recruit star researchers or research teams do not always present themselves in a predictable manner. We propose to include funds each year for outstanding opportunities that arise, primarily in opportunities to recruit funded researchers or research teams. These “opportunity packages” may be applied to any research programs that fall within the broad research themes outlined in the Strategic Plan.
Appendix C: Prioritization Criteria & Progress Reports

A. Requirements
To be considered at all, a research center or program submitted for consideration of funding must first meet the following criterion:

The research problem to be addressed is relevant to child health and/or pediatrics, as judged by:

a. direct relevance to diseases or disorders causing significant morbidity or mortality among children or adolescents, or
b. contribution of fundamental new basic knowledge or new technology relevant to one of the research thematic areas of the strategic plan.

B. Evaluative Criteria
The following criteria will be used to judge concept sheets, with scoring on a 1.0 to 5.0 scale. Using this scale, 1.0 represents an outstanding rating and 5.0 represents an unacceptable or very poor rating.

1) Significance
How significant is the proposal to child health? If the proposed research is disease-related, how important is the disease in causing morbidity or mortality of children or adolescents? If the proposed research is basic or fundamental in nature, how well does the program or center align with a major research theme? If technological or translational in nature, does the proposal tie to one of the service lines at Children's?

2) Impact/Context/Leveraging
How likely is this program or center to have a major impact in the field? What local strengths or resources, such as existing institutional strengths, expertise, initiatives, state directives or interests, or other local context makes the impact of the program or center likely to be high? Are resources available from partner institutions or existing entities that can be leveraged to enhance the success of the proposed program or center? Does the program or center serve as a focal point for recruiting top-notch faculty?

3) Advocates/Investigators
Are the individuals proposing the program/center qualified? Are there strong local advocates for the program or center who will work tirelessly for its success? Are there definitive ties to Children’s partnering institutions? Does the team include basic scientists and clinician-scientists? Are the investigators experienced with mentoring scientists proposed within the program or center?

4) Innovation/Opportunity
Does the program or center represent a compelling opportunity with an innovative approach to enhance the health of children that is not already widely pursued? Will the program or center at its peak be seen as one of the top entities of its kind in the nation? Are there opportunities for unique inventions associated with the program or center?
5) **Extramural Funding**
Are the plans for extramural funding solid and evidence-based? Is the area one that represents a priority for funding from the NIH, NSF, or other major funding source? Is the funding in this area likely to be sustainable? Does the program or center represent an opportunity for philanthropic support? Does the program or center have a viable sustainability plan? Will the program or center generate unique intellectual property?

C. **Metrics of Success**
Existing centers, programs, and projects will be reviewed for evidence of success, to determine whether they have achieved their goals. Center, program, or project directors will provide yearly updates for evaluation as outlined below:

1. **Recruitment/Program building:** required of programs during startup period (up to 3 years):
   - Have recruiting goals been met? Provide details of efforts to build the envisioned research unit, including revised plans if blocks to recruiting have been encountered.
   - Have projects been initiated? List research projects currently underway in the unit. Indicate which projects are receiving direct support from Vision Endowment Funds for Research, and the PI of each project. Provide a progress report for any projects that have been underway for more than 6 months within the unit.

2. **Progress Report:** Provide a Progress Report Summary according to the instructions of the PHS 2590 ([http://grants1.nih.gov/grants/funding/2590/2590.htm](http://grants1.nih.gov/grants/funding/2590/2590.htm)) for each research project receiving support. For NIH-funded projects, an existing 2590 for the project may be provided, but should be modified to include all sections requested below. Include the following sections for each project:

   [Excerpted and modified from PHS 2590 Instructions]

   Well-planned Progress Reports can be of great value by providing records of accomplishments that serve as a basis for continued support of the project. Furthermore, Progress Reports provide information to awarding component staff that is essential in the assessment of changes in scope or research objectives from those actually funded. They are also an important information source for the awarding component staff in preparing annual reports, in planning programs, and in communicating scientific accomplishments to the public and to the Executive Team.

   The Progress Report should be a brief presentation of the accomplishments on the research project during the reporting period, in language understandable to a biomedical scientist who may not be a specialist in the project's research field. The style used in *Scientific American* articles would be appropriate. Abbreviations and language that may not be known to the broader scientific community should be avoided unless clearly defined.

   The entire Progress Report for regular projects, exclusive of the list of publications and the Extramural Funding Report should not exceed two pages. The report should follow the outline and numbering system shown below. Continuation pages may be used as necessary.

   **A. Specific Aims**
   The aims, as actually funded, may differ in scope from those stated in the original, competing application. If the aims have not been modified, state this. If they have been modified, give the revised aims and the reason for the modification.

   **B. Studies and Results**
   Describe the studies directed toward specific aims during the current budget year and the
positive and negative results obtained. If technical problems were encountered in carrying out this project, describe how your approach was modified.

C. Significance
Emphasize the significance of the findings to the scientific field and their potential impact on health of children and/or adolescents.

D. Plans
Summarize plans to address the Specific Aims during the next year of support. Include any important modifications to the original plans. Address any changes involving research using human embryonic stem cells, human subjects, and/or vertebrate animals.

E. Publications
Report publications resulting directly from this grant that you have not previously reported, including manuscripts submitted or accepted for publication. Provide the complete citation (author(s), title, journal or book, volume, page number, year). If available electronically provide a url or PMCID number. If not available electronically you may provide one copy with the progress report. State if there have been no publications.

For each publication that falls under the Public Access Policy, provide the NIH Manuscript Submission reference number (e.g., NIHMS97531) or the PubMed Central (PMC) reference number (e.g., PMCID234567), at the end of the citation. If the PMCID is not yet available because the Journal submits articles directly to PMC on behalf of their authors, indicate "PMC Journal - In Process." A list of these Journals is posted at: http://publicaccess.nih.gov/submit_process_journals.htm.

Note: Only publications that cite “Children’s Healthcare of Atlanta” will be counted as related to the Vision Endowment Funds for Research for the purposes of this progress report. See instructions below on proper citation.

F. Project-Generated Resources
If the research supported by this grant resulted in data, research materials (such as cell lines, DNA probes, animal models), protocols, software, or other information available to be shared with other investigators, describe the resource and how it may be accessed.

NOTE: Include inventions, patents, patent applications in this section

G. Extramural Funding Report
List here grants submitted or awarded that directly relate to the research project. Include the information requested in the table. If no grants were submitted or awarded, provide a brief narrative below explaining your current plans to obtain extramural funding for this project. The first line is an example of the way to fill out this table.

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3. **Guidelines for Citations in Publications:**
Publications resulting from work performed using Vision Endowment Funds for Research should include “Children’s Healthcare of Atlanta” in the Institutions portion of the citation (appearing under the author line of the article).

Acceptable formats for citation include but are not limited to the following:

- Pediatric Urology at Children’s Healthcare of Atlanta, Emory University School of Medicine, Atlanta, GA 30342, USA
- Children's Healthcare of Atlanta and Emory University School of Medicine, Atlanta, GA, USA
- School of Biomedical Engineering, Georgia Institute of Technology and Children's Healthcare of Atlanta, Atlanta, GA, USA
- Department of Pathology, Children's Healthcare of Atlanta at Egleston, Emory University School of Medicine, Atlanta, GA 30322
- Children's Healthcare of Atlanta, Atlanta, GA, USA

Note that a Pubmed search using as search terms the funded author’s name and “Children’s Healthcare of Atlanta” must retrieve the article for it to be counted as a Children’s publication in the progress report.

4. **Scoring of Programmatic Research Success:** The following metrics will be used to score and rank funded programs on a yearly basis. Points will be awarded for new grants directly supported by Vision Endowment Funds, publications, and inventions. Grants cited will be reviewed by program staff to ensure that the PI is the recipient of the Vision Endowment funds, and that the topic is directly related to the project for which the funds were awarded.

A. **Grants** will be weighted as follows:
   a. NIH grant (or equivalent weight proportional to indirect cost return): 0.1 \( \times \) yearly direct cost in thousands of dollars awarded. Example: R01 with $250,000/yr = 25 points.
   b. National or International foundation awards: 0.033 \( \times \) yearly direct cost in thousands of dollars. Example: CF Foundation grant of $300,000 = 10 points.

B. **Publications**: Points equal to the impact factor of the journal cited (according to the ISI Science Citation Index, most recent year’s data). Program staff will search for “Children’s Healthcare of Atlanta” and the author who is the recipient of Vision Endowment Funds, and will assess relevance to the funded project in order to determine the points awarded.

C. **Inventions and Patents**: New patents filed as a result of the funded work will be awarded the following:
   a. 20 points for each new patent resulting directly from the funded work
Definitions:

Extramural funding: NIH, NSF, or major foundation funding. Internal CHOA, Emory, Ga Tech, Morehouse funds or startup funds do not meet this definition.

Impact on health of children or adolescents: diseases, disorders, or conditions that impact the health of children or adolescents is meant to designate those entities that cause significant, measurable morbidity or mortality in pediatric populations (here defined as age 0-21 years) or that promote health in the same populations.

Fundamental new knowledge: New discoveries that may be in the basic or translational sciences. Fundamental new knowledge implies that findings are not incremental, confirmatory, or supportive in nature, but rather break new ground.
Appendix D: External Scientific Advisory Board

Purpose: This document outlines the purpose and proposed procedures for the creation of an external advisory board for the Children’s Healthcare of Atlanta Research Enterprise.

Background: Children’s Healthcare of Atlanta envisions building a top-tier research program focused on child health. To this end, a significant portion (25%) of the endowment has been dedicated to build the enterprise. A Phase I Research Strategic Plan has been completed, resulting in the identification of five major thematic research areas. A Chief Research Officer was hired in March of 2009 to review the plan and move the plan toward implementation. The phase II strategic plan is now in progress. One principle that has come from initial discussions of the RAC is the need for an expert external scientific advisory board to provide objective, critical review of the programs supported through Vision Endowment funds for research. The ESAB will have the following mission:

1) To provide ongoing criticism and advice for the Research Strategic Plan and those charged with its implementation, including the Chief Research Officer, the Academic Council, and the Executive Team.
2) To critique the success of programs currently supported under the Plan.
3) To recommend changes in direction or allocation of resources where necessary.
4) To provide critical input on operational issues that enhance or inhibit the success of the research enterprise.

Operations: The following are proposed:

1) An external scientific advisory board shall be formed.
2) The ESAB should be made up of five members.
3) Membership should include experts in research in child health, from major research institutions. No members should be from institutions affiliated with Children’s Healthcare of Atlanta (Emory, Ga Tech, Morehouse).
4) The ESAB shall meet in Atlanta once per year. Formal presentations will be organized by the CRO, and will feature leaders of the Research Department, Centers, and other research leaders or programs receiving support through the Vision Endowment funds for research.
5) The ESAB shall elect a chair. The chair will be responsible for compiling a report at the conclusion of the one day meeting.
6) The members will be requested to serve for a 5 year term. Nominations will be taken from the Academic Council and others; invitations will be extended by the CRO or the Emory DOP Department Chair.
Joint Meeting of the Woodruff Health Sciences Center and Children’s Healthcare of Atlanta Boards of Trustees

August 25, 2009
A Wonderful Success

Donna Hyland
In the Beginning...
Today

[Images of Children's Healthcare of Atlanta facilities and logos]
Accomplishments

- 1998: DOP Building
- 2001: 5 COEs Nationally Recognized
- 2004: Hughes Spalding
- 2006: 8:10 AMSA
- 2007: FORTUNE 100 Best Companies to Work For 2006
- 2007: Emory JV
- 2008: Marcus Autism Center

Employer of Choice

Financial Strength / AA Bond Rating
Children’s is the Largest Pediatric Provider in the U.S.

- Children’s serves 8:10 pediatric inpatient cases in the Atlanta MSA and 4:10 statewide.

- In 2008, Children’s saw 262,769 patients originating from all 159 Georgia counties.

- 2008 Key Statistics*:
  - 24,037 hospital admissions (#1)
  - 283,281 ED/immediate care visits (#1)
  - 141,669 inpatient days (#2)
  - 38,174 surgeries (#2)

- 1,712 physicians – 409 Emory affiliated

* Includes Hughes Spalding
Department of Pediatrics
Accomplishments

Barbara Stoll, M.D.
Journey of the Aflac Cancer Center

Building a Center of Excellence

2001

Recruitment of Dr. Bill Woods to lead comprehensive Hem/Onc program at Egleston and Scottish Rite

2002

BMT program

Innovative Therapy referral center for Clinical Research in relapsed cancers

2003

Dr. Durden begins basic and translational research

Family Support Team endowed with $2.5M

2004

Outpatient Clinic opens at Scottish Rite

Pediatric research building opens; provides offices and laboratories

2005

Endowment Corpus $25M

$5.1M research grants

Dr. Durden receives $1.5M endowed chair

2006

9 Fellowship training positions

Gene Therapy Research for Hemophilia A funded with a $3M gift

Self imposed review by external advisory board

2007

Sickle Cell Disease Clinic opens at Hughes Spalding

Outpatient Clinic opens at Egleston

2008-2009

Endowment corpus $45M

$7.6M research grants

8 endowed chairs for Hem/Onc

167 national media hits

National sickle cell disease summit

Dr. Durden’s targeted therapy research finds international audience

Created or modified facilities

Negotiated “uncharted territory” with Emory such as lease model

Nurtured relationship with Aflac - $47M support
Vision for Pediatrics

Fred Sanfilippo, M.D.
MISSION
To enhance the lives of children through excellence in patient care, research and education.

VISION
To transform pediatric healthcare and be the leading voice for the health of Georgia’s children.
Children’s is a Leader Clinically

Parents Magazine Rankings
1. Children’s Hospital of Philadelphia
2. Children's Hospital Boston
3. Children’s Hospital of Wisconsin
4. Cincinnati Children’s Hospital
5. St. Louis Children’s Hospital
6. Nationwide Children’s Hospital, Columbus
7. Texas Children’s Hospital, Houston
8. Children’s Healthcare of Atlanta
9. Rainbow Babies & Children’s Hospital, Cleveland
10. The Children’s Hospital in Denver

US News & World Report Rankings by Specialty
- Orthopedics #5
- Heart & Heart Surgery #7
- Cancer #12
- Digestive Disorders #12
- Respiratory Disorders #17
- Urology #18
- Neurology & Neurosurgery #26
- Diabetes/Endocrine Disorders #26
- Kidney Disorders #29
## NIH AWARDS TO CHILDREN'S HOSPITALS AND THEIR PRIMARY UNIVERSITY AFFILIATED

### DEPARTMENT OF PEDIATRICS-COMBINED

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<td>University of Washington School of Medicine</td>
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<td>Rainbow Babies and Children's Hospital</td>
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<td>9</td>
<td>Johns Hopkins Children's Center</td>
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<td></td>
<td>Emory University School of Medicine</td>
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</tbody>
</table>
Pediatric Center Structure
Pediatric Research Plan

Paul Spearman, M.D.
Together, We Are Making Strides in Pediatric Research…

Department of Pediatrics:
Total Research Awards FY99 - FY09

Source: Office of Research Administration
But, We Have a Long Way to Go!

Grant Funding (2008)

<table>
<thead>
<tr>
<th>NIH Ranking</th>
<th>DOP</th>
<th>Hospital</th>
<th>Hospital</th>
<th>DOP</th>
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<td>27</td>
<td>1</td>
<td>3</td>
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</table>
To improve the health of children through innovation and excellence in research.
Children with high risk neuroblastoma treated with tandem bone marrow transplant have better outcomes than children treated with single bone marrow transplant.
Pediatric Research: Existing Centers/Programs

Research Themes

- Immunology & Vaccines
- Experimental Technologies & Therapeutics
- Genetics & Developmental Biology
- Vascular Biology
- Clinical Outcomes & Public Health

Priority Areas

- AFLAC Cancer Center
- Sickle Cell
- Innovative Therapies
- Hemostasis/Thrombosis
- Cancer Survivorship
- Blood and Marrow Transplant
- Solid Tumors

Research Infrastructure

Clinical Research Support, Pilot Grants, Cores, Clinical Informatics, Sustainability Plan
High Priority Areas in Pediatric Research

Research Themes
- Immunology & Vaccines
- Experimental Technologies & Therapeutics
- Genetics & Developmental Biology
- Vascular Biology
- Clinical Outcomes & Public Health

Priority Areas
- Immunology/Vaccines
- Transplant Immunology
- Engineering/Translational Research GT
- Developmental Lung Biology
- Endothelial Cell Biology
- Cystic Fibrosis
- Cardiovascular Biology
- Transplant Immunology
- Immunology/Vaccines

Research Infrastructure
- Clinical Research Support, Pilot Grants, Cores, Clinical Informatics, Sustainability Plan

AFLAC Cancer Center
Filling Gaps in Pediatric Research

Research Themes
- Immunology & Vaccines
- Experimental Technologies & Therapeutics
- Genetics & Developmental Biology
- Vascular Biology
- Clinical Outcomes & Public Health

Priority Areas
- Immunology/Vaccines
- Transplant Immunology
- Center for Drug Discovery
- Engineering/Translational Research GT
- Center for Autism Research
- Developmental Lung Biology
- Cardiovascular Biology
- Outcomes/Wellness
- Obesity

Research Infrastructure
- Clinical Research Support, Pilot Grants, Cores, Clinical Informatics, Sustainability Plan
Road to the Top 10

NIH Ranking

- **Top 30**
  - Total Grant Rev: $21M
  - NIH Revenue: $11M
  - Space: 102K
  - Total PIs FTE: 70
  - NIH PIs FTE: 27

- **Today**

- **Top 20**
  - Total Grant Rev: $33M
  - NIH Revenue: 163K
  - Space: 90
  - Total PIs FTE: 47
  - NIH PIs FTE: 47

- **2018**
  - Total Grant Rev: $50M
  - NIH Revenue: 217K
  - Space: 112
  - Total PIs FTE: 69
  - NIH PIs FTE: 69

- **Top 10**
  - Total Grant Rev: $76M
Emory’s Research Strategy

David Stephens, M.D.
93% of Research Funding at Emory in WHSC
29% growth (5.8%/yr) in $ in last five years
64% of funding is from NIH

*2008:
- $387,537,771
- 642,823 NASqft
- 828 PIs
- 2734 awards
- 356 NIH PIs with 562 awards
- $246,400,000
Emory Research Strategy

**Goals to live by**

We will transform health and healing together by being:

1. The 21st-century model for an academic health sciences and services center

2. An international leader in the highest quality patient care, research, education, and public service

3. A collaborative, inspirational environment that attracts and retains talented people.

---

*Research*

- Recognition, Rewards, Metrics
- Interdisciplinary Research
- Centers**
- Research Education, Training
- Integration Clinical, Education Missions
- Infra-structure, Platforms, Cores
- Strategic Partnerships *

---

**Children’s Healthcare of Atlanta**

**Georgia Tech**

**Morehouse School of Medicine**

**Georgia Research Alliance**

**CDC**
WHSC Cross-Cutting Centers**

- Winship Cancer Institute
- Yerkes Primate Center
- Heart and Vascular Center
- Neurosciences
- Vaccines/Immunology/ID Centers
- Comprehensive Informatics
- Transplantation
- Predictive Health
- Drug Discovery
- CTSA
- Critical Care
- Center for Systems Imaging
- Aging
- Global Health
- Pediatrics

CTSA Clinical & Translational Science Awards
WHSC Research Initiatives

- American Recovery and Reinvestment Act (ARRA), Research and Development $21.5B
  - NIH $10.4B, NSF $3B, CDC $300M $1.1B AHRQ, NIH, HHS
- Research Resources Master Plan
  - Space
    - Efficiency and Renovation
    - New
      - SPH
      - Turman Site
  - Cores: CryoEM, Genomics
- Communications
- Research Infrastructure
WHSC Research Initiatives

- WHSC Strategic Research Plans
  - SOM: Achievements, Infrastructure, Partnerships
  - SON: Building Critical Mass
  - SPH: Interdisciplinary Science (Informatics, ID, Global Health)

- Integration and Use of Research Metrics

- New Interdisciplinary Research Initiatives
  - Regenerative Medicine
  - Biomedical Informatics
  - Clinical Research

- Research Training/Education
  - CTSA KL and TL Programs
  - T32 Training Grants
Pediatric Center
Joint Research Commitment

Donna Hyland
Fred Sanfilippo, M.D.
National Leader in Pediatric Research

First Leap
- Researchers: $46M
- Space & Equipment: $44M
- Annual Grant Rev: $21M
- Annual NIH Rev: $11M (50%)

Second Leap
- Researchers: Existing + Stars: $140M
- Space & Equipment: $40M
- Annual Grant Rev: $50M
- Annual NIH Rev: $33M (66%)

Third Leap
- Researchers: Existing + Stars: $135M
- Space & Equipment: $35M
- Annual Grant Rev: $76M
- Annual NIH Rev: $50M (66%)

2018
- Top 10 NIH
- Researchers: Existing + Stars: $180M
- Annual Grant Rev: $50M
- Annual NIH Rev: $33M (66%)

2009
- Top 30 NIH
- Annual Grant Rev: $21M
- Annual NIH Rev: $11M (50%)
Pediatric Center Research Investment: Top 10 - 2018 Need

Funding Need = $350M

Sources

- Endowments & Gifts
- Joint Fundraising
- Other Academic Partners
- Intellectual Property Monetization
- Grants & Other

Sources Identified ≈ $175M
Funding Need ≈ $175M over 9 years

Researchers
$275M

Space & Capital
$75M
Critical Success Factors

- Leadership
- Structural alignment
- Cultural alignment
- Joint funding
- Joint fundraising
The Future is Bright!
Discussion/Q&A
Strategic Plan Structure & Leadership

Updated: October 2009
2009 Research Major Initiatives

Quarter 1 (Jan.-March)
- Hire CRO by end of Quarter 1
- Determine space and package investment (Jacobs Consultancy, finalize assumptions, determine package investment requirement, update model, tie back to 2018 model)
- Critical Milestone: July 21st Board Meeting

Quarter 2 (April-June)
- Validate and update research strategic plan. Assure alignment with DOP research component (Metrics of Success, Affiliation Synergies, Strategic Focus Areas within research themes for key recruitment, Key Performance Metrics)
- Critical Milestone: Aug. 25th Board Meeting

Quarter 3 (July-Aug.)
- Solidify and develop relationships with key affiliations (Emory, Georgia Tech, UGA). Alignment with overall Children’s research strategic plan.

Quarter 4 (Sept.-Dec.)
- Approve research vision endowment dollars for 2010 (Academic Council)

(Emory, Children’s Initiative, Children’s & Emory Initiative, Critical Milestone)
Research Leadership, Oversight & Approval

- **Children’s Board**
- **Woodruff Health Sciences Center (WHSC) Board**
- **Children’s Executive Team**
- **Emory’s Leadership**

**Children’s Executive Team**
- Research Leader, Oversight & Approval
- Research Strategic Plan Champion Guiding Team
- Research Space & Package Champion Guiding Team

**Funding**
- Jacobs Consultancy Work

**Purpose**
- Establishes objectives, provides oversight and content thought leadership, removes barriers, etc.
- Progress Updates at meetings

**Research Leadership, Oversight & Approval**
- **Children**
- **Children’s/Emory**
- **Emory**

**Academic Council**
- Purpose:
  - Oversees both Research & Teaching
  - Updates on achieving 2009 goals
  - Approval Body for Academic Vision Endowment Budget

**Purpose**
- Establishes objectives, provides oversight and content thought leadership, removes barriers, etc.
- Progress Updates at meetings

**As Necessary**
- Space & Package Approval
- Research Strategic Plan Approval

Prepared by Strategy & Business Development
E-CC Board & Academic Council Invitees

**E-CC Board**
- Jay Berkelhamer, MD  Chief Academic Officer, Children’s Healthcare of Atlanta
- John T. Fox  President & CEO, Emory Healthcare
- Donna Hyland, CEO, Children’s Healthcare of Atlanta
- Carolyn Kenny, EVP, Clinical Care, Children’s Healthcare of Atlanta
- Thomas Lawley, Dean - Emory School of Medicine
- Fred Sanfilippo, MD  
  - Executive VP, Health Affairs
  - CEO, Woodruff Health Sciences Center
  - Chairman, Emory Healthcare
- Barbara Stoll, MD  CEO – Emory-Children’s Center and Chairman of E-CC Board

**E-CC Board Staff:**
- Ruth Fowler, SVP Finance, CFO, Children’s Healthcare of Atlanta
- Jimmy Hatcher, CFO – Emory Healthcare
- Beth Howell, SVP Academic Administration, Children’s Healthcare of Atlanta
- Lucky Jain, MD  Executive Vice Chair, Medical Director of E-CC
- Philip Smart, Director of Financial Services, E-CC

**Academic Council**
- Dr. Berkelhamer, Chief Academic Officer
- Ruth Fowler, SVP Finance, CFO
- Beth Howell, SVP Academic Administration
- Leslie Jones, SVP General Counsel
- Dr. Barbara Stoll, Chair Dept. of Pediatrics
- Dr. Paul Spearman, CRO of Children’s & Vice Chair of Research, Emory Dept. of Pediatrics

**Staff Attendees:**
- Tom Brems, VP Corporate Finance
- Dr. Jim Fortenberry, Physician
- Bill Lee, Dir. Medical Staff Admin
- Liz McCarty, Director, Business & Finance, E-CC
- Kris Rogers, Director of Clinical Research
- Kate Sutton, Special Project Manager, Academic Administration
- Lela Wulf, Director Finance, Academic Administration
- Julie Trackman, Manager, Strategy & Business Development
# Research Strategic Plan Champion

Guiding Team Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Institution</th>
<th>Project Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jay Berkelhamer, MD</td>
<td>Chief Academic Officer</td>
<td>Children’s</td>
<td>Executive Sponsor</td>
</tr>
<tr>
<td>Beth Howell</td>
<td>SVP, Acad. Administration</td>
<td>Children’s</td>
<td>Executive Sponsor</td>
</tr>
<tr>
<td>Paul Spearman, MD</td>
<td>Chief Research Officer</td>
<td>Children’s/Emory</td>
<td>Research Leader</td>
</tr>
<tr>
<td>Kris Rogers</td>
<td>Dir., Clin. Research Dept.</td>
<td>Children’s</td>
<td>Research Leader</td>
</tr>
<tr>
<td>Barbara Stoll, MD</td>
<td>Chair, Dept. of Pediatrics</td>
<td>Children’s/Emory</td>
<td>Team Member</td>
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<tr>
<td>Liz McCarty</td>
<td>Dir., Bus. &amp; Fin., Dept. of Peds</td>
<td>Emory</td>
<td>Team Member</td>
</tr>
<tr>
<td>Jim Fortenberry, MD</td>
<td>Division Chief, Critical Care</td>
<td>Children’s</td>
<td>Team Member</td>
</tr>
<tr>
<td>Julie Trackman</td>
<td>Manager, Strategy</td>
<td>Children’s</td>
<td>Project Manager</td>
</tr>
<tr>
<td>Lela Wulf</td>
<td>Dir., Finance Acad. Admin</td>
<td>Children’s</td>
<td>Team Member</td>
</tr>
<tr>
<td>David Stephens, MD</td>
<td>VP Research, WHSC</td>
<td>Emory</td>
<td>Team Member</td>
</tr>
<tr>
<td>Barbara Boyan, PhD</td>
<td>Assoc. Dean Research</td>
<td>Georgia Tech</td>
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<tr>
<td>Don Chapman</td>
<td>Children’s Board Member</td>
<td>Children’s</td>
<td>Liaison</td>
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</tbody>
</table>

*Prepared by Strategy & Business Development, April 2009*
**DRAFT: Research Case for Support**

**Executive Summary – The Pediatric Center – A Joint Research Commitment**

Both Children’s and Emory have developed aggressive strategic plans for clinical operations, teaching and research that include the ambitious goals of national preeminence. Both institutions acknowledged early on that neither could achieve this goal individually. Children’s and Emory have achieved great success together in recent years including an increase in NIH funding from $3 million to $11 million and a growing pediatric residency program. Aligning our organizations is critical to our success. With our common vision and objectives, we must align our goals, measures of success and importantly our collective resources to the highest advantage to have the greatest impact.

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**Strategic Vision**

Children’s and Emory University plan to establish a Pediatric Center, the structure through which Emory, Children’s and other partners will work together to achieve the joint vision and goals. The intent of the Center is to include all areas and faculty at Emory that have a significant portion of their efforts in pediatrics. The Pediatric Center will be accountable for driving high quality clinical care through the Emory-Children’s Center practice plan, delivering a joint Children’s/Emory research strategic plan and a joint Children’s/Emory graduate medical education plan.

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**Woodruff Health Sciences Center**

The vision of the Woodruff Health Sciences Center is transforming health and healing... together. That last word makes the first words possible. Together we are working to pioneer discoveries to prevent and treat disease, to prepare the next generation to save and improve lives, and to provide the highest-quality clinical care possible.
The Department of Pediatrics is the second largest department in the Emory School of Medicine with 267 faculty. The largest pediatric multispecialty group practice in Georgia, the Emory-Children's Center (ECC) is a joint venture between Emory and Children's Healthcare of Atlanta. It comprises 237 Emory physician faculty involved in pediatric clinical services, teaching, research, and child advocacy. Predictive Health is a strategic focus for WHSC. Predictive health starts in the womb and early childhood. Childhood interventions to enhance health and healthy living will have a lasting impact on adult health, reducing disease and improving quality of life. This effort is already underway in pediatrics. Lead by Dr. Stoll, Chair of the Department of Pediatrics, Emory was awarded $28.5 million dollars in federal funding for National Children’s Study, a collaborative to prevent and treat problems such as birth defects, autism, and diabetes.

Children's Mission and Vision

Children's mission is to enhance the lives of children through excellence in patient care, research and education. We provide care through 510 staffed beds in three hospitals, 16 neighborhood locations throughout metro Atlanta and access to more than 1,400 pediatric physicians.

Children’s Healthcare of Atlanta is built on the combined histories and excellence of Egleston Children’s Healthcare System, founded in 1928, and Scottish Rite Children's Medical Center, founded in 1915. In 1998, the hospitals joined to become Children's Healthcare of Atlanta, resulting in reduced duplication of services, elimination of expenses, and an enhanced capacity with focus on one priority—helping sick and injured children. In February 2006, Children’s assumed responsibility for the management of services at Hughes Spalding Children’s Hospital, part of Grady Health System®. Children’s manages Children's at Hughes Spalding, as it is now known, through its affiliate, HSOC, Inc.

In 2008, Children’s embarked on its second decade of service to the children of Georgia by redefining its vision to transform pediatric healthcare and be the leading voice for the health of Georgia’s children. Vision 2018 is a 10 year plan for accelerating our already nationally ranked clinical excellence through bold strokes in pediatric research, physician teaching and wellness for children.

At Children's Healthcare of Atlanta in partnership with Emory and other academic partners, researchers seek answers to the most complex childhood medical conditions with two goals in mind: discovery and integration. Through translational research—bringing new discoveries from bench to bedside—Children’s provides leading-edge care to our patients and helps our physicians have the most up-to-date, innovative treatments available.

Children’s Accomplishments
Children’s has grown quickly to become the largest children’s hospital in the nation. Children’s has consistently higher volumes than other top hospitals. Children’s has consistently achieved top 10 rankings from Child and now Parent Magazine and has achieved top sub specialty rankings in US News & World Report.

Opportunity in Pediatric Research

- According to NACHRI (National Association of Children’s Hospitals and Related Institutions) Children’s and the Emory Department of Pediatrics jointly rank 41st in NIH (National Institutes of Health) funding. The NIH rank is a key measure of success for a research enterprise and Department of Pediatrics.
- Our program is young in comparison to the top ranked programs who have been working to build their research program for the past 80 years.
- We have a unique and significant opportunity to leverage the vast capabilities of the Atlanta area and partner with institutions like Georgia Tech, CDC, and Morehouse to advance pediatric research.
- No other Children’s hospital has an opportunity like this. We are living in an era of transformation and change, our relationships will allow us to advance further faster.

Children’s, in partnership with leadership in the Department of Pediatrics and others, developed the first phase of a research strategic plan in 2007. In the initial plan, 5 broad research themes were identified, Immunology and Vaccines, Experimental Technologies and Therapeutics, Genetics and Developmental Biology, Vascular Biology, and Clinical Outcomes and Public Health. The themes are intended to be broad areas of investigation to support multi-disciplinary, collaborative research efforts. At that time, Children’s Board of Trustees allocated a portion of the endowment towards research and approved an initial plan that outlined the thematic approach to research and the need to recruit a strong scientific leader for the research enterprise. In early 2009, Children’s and Emory recruited Paul Spearman M.D. as Chief Research Officer at Children’s and Vice Chair for Research in the Department of Pediatrics. Dr. Spearman has led the second phase of strategic planning for research. Dr. Spearman has validated the themes, established goals for the enterprise and identified priority areas for initial investment.

Research Vision

To improve the health of children through innovation and excellence in research

Research Goals

- To become a Top 10 NIH funded institution as ranked on the NACHRI Children’s Hospital and Primary University Affiliated Department of Pediatrics list with funding primarily coming to the Department of Pediatrics.
- To grow Department of Pediatrics to 70 funded Principal Investigators by 2018
- To leverage Children’s investment with extramural, donor and affiliate investments
- To identify and build research space to allow for anticipated growth
- To develop a plan with to establish an entity that has national recognition between Children’s and it’s academic affiliates
- To develop a sustainable financial model for ongoing sustainability of research program

Pediatric Research Priority Areas
Research priority areas were established through a competitive process and evaluated by the Research Advisory Committee chaired by Dr. Spearman. Initial Priority areas are those that were determined to have the highest potential for immediate success. They build on current strengths, align with Children’s and Emory’ strategic initiatives and will allow for recruitment of key investigators. These research priority areas will be underpinned by a strong research infrastructure that will include research administration, clinical research support, pilot grant support, statistical and informatics support and ongoing sustainability for successful investigators. Initial investment will begin January 2010 in those areas where leadership and faculty are in place as will recruitment for leadership in those areas without an identified leader.

<table>
<thead>
<tr>
<th>Priority Area</th>
<th>Scientific Leader</th>
<th>5 Year Investment/Millions*</th>
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<tbody>
<tr>
<td>Immunology and Vaccine</td>
<td>Paul Spearman MD</td>
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<tr>
<td>Transplant Immunology</td>
<td>Allan Kirk MD &amp; Leslie Kean MD PhD</td>
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<td>Engineering and Translational Research</td>
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<td>Outcomes and Wellness</td>
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<tr>
<td>Neurosciences</td>
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</tr>
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</table>

*Investment in priority areas will be focused towards recruitment of star investigators and minimal administrative fees.

**Research priority areas listed above are in addition to Drug Discovery lead by Raymond Schinazi, PhD

***Above represents 55% of total 5 year research operating budget. Total budget will support administrative infrastructure, sustainability for existing investigators, core services