Program Plan for the
Barbara Davis Center at Fitzsimons - Phase 2

July 5, 2002

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Program Plan for the Barbara Davis Center at Fitzsimons - Phase 2

I. Preface and Summary

A. Executive Summary

The Barbara Davis Center for Childhood Diabetes at the University of Colorado Health Sciences Center is the largest diabetes and endocrine care program in the Colorado community. The Center cares for the majority of children with Type 1 diabetes in the state of Colorado and approximately 20% of its patients come from throughout the United States, as well as internationally, for care. Since 1992 clinical income has grown approximately tenfold, the number of patients visits has greatly increased, and dramatic new therapies and monitoring devices have been studied and/or introduced into practice. Outreach programs extend throughout the Rocky Mountain Region and children from all over the United States and several foreign countries come to the Center for specialized care. The Center has earned an international reputation for its programs in the clinical treatment, research and education of Type 1 diabetes patients and is an important resource of the University of Colorado Health Sciences Center (UCHSC).

The Program Plan for the $16.7 million, Phase 1 development of a new facility for the Barbara Davis Center at the Fitzsimons campus in Aurora, Colorado was approved by the University of Colorado Board of Regents in August 2000, and the Colorado Commission on Higher Education (CCHE) in January 2001. The Phase 1 project involves the construction of a new 53,715 gross square foot (gsf) facility, of which 33,385 gsf (21,700 net assignable square feet (nASF)) will be finished to house the research division and translational research programs of the Barbara Davis Center. The remaining 20,330 gsf (13,215 nASF) of space will be constructed as shelled space during Phase 1. The design phase for the Barbara Davis Center at Fitzsimons -Phase 1 project was initiated in June 2002. The project design team is led by Anderson Mason Dale Architects of Denver, Colorado.

The Phase 2 project involves the fit-out/finishing of the remaining 20,330 gsf for the clinical program division of the Center. The Phase 2 project cost is estimated to total $3.395 million and is proposed as an entirely cash-funded project. The Phase 2 project construction schedule will be coordinated with the Phase 1 development schedule with the completion and occupancy of the entire 53,715 square foot building anticipated for June 2005. The new Barbara Davis facility is to be located in the Fitzsimons campus research zone on a site east of the new Research Complex 1 facility and south of the existing Administration Building (Building 500).

The future of the Barbara Davis Center, the growth of the Center’s clinical programs and the maintenance of the standards of quality in clinical care depend upon the availability of the new Phase 2 space at Fitzsimons. To ensure the continued success of the Barbara Davis Center, it is necessary that both the clinic and research division programs be relocated to the new Fitzsimons facility at the completion of the Phase 2 construction. Without the additional finished space, the clinical division program will need to remain at the 9th Ave and Colorado Blvd. facility, thereby resulting in divided research and clinical programs.

University of Colorado Health Sciences Center
Program Plan for the Barbara Davis Center at Fitzsimons - Phase 2
B. Program Plan Purpose

The primary purpose of this facility program plan is to seek appropriate approvals from the University of Colorado Board of Regents and the Colorado Commission on Higher Education (CCHE) to:

Allow the University of Colorado Health Sciences Center to proceed with design and finish of 20,330 gross square feet within the Barbara Davis Center at Fitzsimons necessary to house the clinic division programs of the Barbara Davis Center. The total project budget is $3.395 million. Project revenue sources include $3.395 million from exempt cash funds comprised of internal cash. No state funds are being requested for this project.

This capital facility project involves the design and fit-out of approximately 20,330 gross square feet of space constructed as shell space during the Phase 1 project construction. This space will be finished to house the Center's clinical division programs, including the Pediatrics Clinic, the Young Adult Clinic, and the Eye Clinic, and related building support space. The space will be designed as flexible as possible in order to accommodate the evolving clinical program and clinical research needs of the Center over the life of the facility. Patient comfort, convenience, and safety are major considerations in the space planning and design.

C. Program Planning Process

The program plan was completed under the direction of the Barbara Davis Center Oversight Committee. This Committee is comprised of the Center’s Executive Director, Clinical and Research Division Directors, Center faculty, Barbara Davis Foundation representatives, and staff from the UCHSC Facilities Projects, Institutional Planning, and School of Medicine Dean’s Offices.

The program plan analysis was competed in several major programming stages. The first programming stage involved an internal analysis and space projection review by the Clinical Division staff of the Barbara Davis Center. The second stage involved the verification of the Phase 1 space plan including building support space and clinical research support requirements. The third programming stage evaluated the program space needs and related facility phasing requirement assumptions of the Phase 1 program plan. As a result of this analysis, the Phase 1 facility space plan was revised to 53,715 gsf from the previous total of 50,902 gsf. Of this total, approximately 33,385 gsf (21,700 nasf) will be constructed and finished in Phase 1 to house the research programs of the Barbara Davis Center. The remaining 20,330 gsf (13,215 nasf) necessary to house the clinical division programs and related building support space will be constructed as shell space in Phase 1 and finished in Phase 2. During the Phase 1 program plan verification process, all planning assumption were reviewed by the Oversight Committee.

Upon completion of the campus review process, the Phase 2 program plan will be presented to the University of Colorado Board of Regents and the Colorado Commission on Higher Education for appropriate reviews and approvals.
II. Program Information

A. Description of Program

The Barbara Davis Center for Childhood Diabetes is the largest diabetes and endocrine care program in the Colorado community. The Center is managed as an administrative unit of the University of Colorado’s School of Medicine and is currently located within a 35,000 square foot building on the University of Colorado Health Sciences Center campus at Ninth Avenue and Colorado Boulevard in Denver, Colorado. This Center facility opened in 1980 and was expanded in 1983, 1986, and 1994. The Center’s independent budget, major fund-raising events and endowments provide unique facilities and resources for clinicians, clinical researchers and basic biomedical scientists working to help patients with Type 1 diabetes. The Barbara Davis Center provides state-of-the-art clinical diabetes care to a majority of children and many adults within the Rocky Mountain Region as well as receiving national and international referrals. In May 1980, 450 patients were seen at the Center, now more than 4,000 are seen and followed annually.

In June 2000, due to the critical program space shortage resulting from the research and clinical program expansion and development, and the UCHSC’s plan to relocate its campus to the Fitzsimons site, it was decided by the Barbara Davis Foundation and the University to proceed with the plan to relocate the Center to a new facility at the Fitzsimons site. The program plan document for the Phase 1 design and construction of the new facility was approved by the University of Colorado Board of Regents in August 2000, and the Colorado Commission on Higher Education (CCHE) in January 2001. The Phase 1 project involves the construction of a new 53,715 gross square foot (gsf) facility, of which 33,385 gsf (21,700 net assignable square feet (naf)) will be finished to house the research division and translational research programs of the Barbara Davis Center. The remaining 20,331 gsf (13,215 naf) of space will be constructed as shelled space during the Phase 1. The shelled space, which is necessary to house the Clinical Division of the Barbara Davis Center, will be completed during the second phase. The Phase 1 project design is currently underway.

B. History, Role and Mission of the Barbara Davis Center

In 1976, the youngest daughter of Marvin and Barbara Davis was diagnosed with diabetes and was referred to the Pediatric Metabolic Clinic at the University. At that time, there were only a very few clinics dedicated to the care of children with diabetes in North America. It was the Davis’ hope, and that of a small committee of mothers of children with diabetes, that by opening a center in Denver it would be possible to bring the highest standards of care to children in the Rocky Mountain Region and at the same time set in place a research program that one day would lead to the means of prevention or cure. It was with that vision that the Barbara Davis Center became a reality in 1980.

The mission of the Barbara Davis Center is to provide care for children and adults with Type I diabetes, to provide a unique environment to foster clinical and basic biomedical research, and to support the development and application of research for the prevention, cure and understanding of the disease process that leads to Type I diabetes. The Barbara Davis Center for Childhood Diabetes is a tremendous asset to the Health Sciences Center and the University of Colorado by providing teaching experiences for medical students, endocrine fellows, child health associates,
predoctoral research students and postdoctoral fellows; providing primary care and referral services to children and adults with Type 1 diabetes; operating outreach programs in the Rocky Mountain Region where physicians provide care and advice to patients in remote areas, and functioning as a unique research facility for basic science and clinical researchers working on the prevention, treatment and management of Type 1 diabetes.

The organizational chart for the Barbara Davis Center is presented below in Figure 1. The Center is comprised of two major program divisions: the Research Division and the Clinical Division. In 1992, Dr. George Eisenbarth was recruited to head the Center, in 1996, Dr. John Hutton became the Research Director, and in 2000, Dr. Marian Rewers became the Clinical Director.

Figure 1

Barbara Davis Center for Childhood Diabetes

The Barbara Davis Center is integrated into the University of Colorado Health Sciences Center campus, shares many faculty appointments, and is also involved in interdisciplinary research programs in a number of departments on campus and at the National Jewish Center. All Center faculty are appointed in the School of Medicine in collaboration with appropriate department chairs.
C. Program Needs and Trends

Clinical Program

Over the last 22 years, the Center has grown from a Pediatric Clinic caring for 400 children to a complex institution that provides clinical care to over 4,000 patients and leads the nation in childhood diabetes research. The Barbara Davis Center has become what is probably the largest childhood Type 1 diabetes care facility in the United States. The Center cares for the majority of children with Type 1 diabetes in the state of Colorado and approximately 20% of its patients come from throughout the United States, as well as internationally for care. Since 1992 clinical income has grown approximately tenfold, the number of patients visits has greatly increased, and dramatic new therapies and monitoring devices have been studied and/or introduced into practice. Outreach programs extend throughout the Rocky Mountain Region and children from all over the United States and several foreign countries come to the Center for specialized care. The Barbara Davis Center’s clinical division programs provide comprehensive clinical care delivered by a team of 17 doctors, 12 diabetes nurse educators, 4 dieticians, 2 social workers, and other ancillary clinical and clinical research staff.

The number of annual patient visits is illustrated in the following Figure 2. Annual visits are projected to increase from 14,200 in 2001-02 to an estimated 21,500 in 2005-06. Approximately 30-40% of these visits are for clinical research.

Figure 2

Barbara Davis Center
Annual Patient Visits
Brief overviews of several major clinical program functions and initiatives are presented below.

The Pediatric Clinic, headed by Dr. Georgeanna Klingensmith, serves over 2,700 children with diabetes. Every year, the Clinic provides initial treatment and education to nearly 200 families with newly diagnosed child and 70-100 new families that come to the Center for further help, after initiation of treatment elsewhere. The Center also teaches other doctors, nurses, dieticians, and psycho-social care providers. The 6th biennial Keystone Conference in July 2000 was attended by over 300 participants from all over the U.S. Clinic staff travels regularly to remote areas of Colorado and neighboring states to provide outreach clinics and educational programs. Annually, the Center distributes over 20,000 copies of the educational textbook “Understanding Insulin Dependent Diabetes” by Dr. Peter Chase, now in its 9th edition.

The pediatric insulin pump program has grown dramatically with over 4,000 pump patient visits since 1997. With clinical research into Glucowatch, MiniMed and Spectrx continuous glucose monitoring systems spearheaded by Dr. Chase over the past two years, the Clinic is now opening a new frontier in the standards of care for children with diabetes.

The Young Adult Clinic, headed by Dr. Satish Garg, offers a unique model of continuity of care for diabetic children who outgrow the Pediatric Clinic. As the Center’s patients become older, care of such complications have assumed more importance. There has been an increasing need to develop treatment and maintenance programs for this adult population. In that diabetes impacts increasingly with age, the Center has become very committed to providing additional services to such adult patients, in the main to prevent complications either effecting the patients, or their infants. Many of the 1,400 young adults seen at the BDC have no health insurance and inadequate primary health care as they go through difficult years of college, first employment, and starting families. The Young Adult Clinic staff has been instrumental in bringing to this patient population both structure and the newest advances in diabetes care, such as Humalog and other insulin analogues, insulin pumps, Glucowatch, 24-hour ambulatory blood pressure monitoring, and most recently the electron beam computed tomography for early detection of coronary heart disease.

The Ophthalmology (Eye) Clinic, directed by Dr. William Jackson and opened in 1996, provides in-house comprehensive retinal care for diabetic children and adults alike. Technological advances in digital imaging of the back of the eyes without the need of dilating the pupils has made screening for diabetic eye disease easy and widespread. While sophisticated laser therapy is available at the Eye Clinic, with preventive measures it may become needed less frequently in the future.

The Pediatrics, Young Adult, and Eye Clinics and the associated clinical research programs have continued to expand over the last decade. As indicated in Figure 3, the clinical income revenue for the Barbara Davis Center is projected to increase from approximately $1,550,000 in 2001-02 to $2,353,000 in 2005-06. Clinical revenues have been growing at 11-12% annually over the past 3 years. The UPI clinical income source accounts for only 26% of the total Center’s Clinical Division income in the FY2002-03, with 46% coming from clinical research grants and contracts (mostly
Although the clinical treatment and prevention of Type I diabetes is a medical subspecialty, to a large extent, the Center must continue to provide and develop complete primary health care programs for its patient population. The chronic complications of Type I diabetes remain a major problem, including retinopathy, nephropathy, neuropathy, and vascular disease. The Center's faculty have already pioneered studies in the natural history of these complications in young children and developed innovative trials for the prevention of complications. A major goal in limiting complications is meticulous diabetes control, which the Center strives to achieve. Thus alternative interventions, such as the clearly beneficial laser therapy for late eye disease and the evaluation of specific antihypertensive drugs for renal disease is ongoing. The growth in clinical research income is illustrated in the following Figure 4.

Several important clinical studies have been underway at the Center over the past five years. The Diabetes Prevention Trial (DPT-1) has been the first large placebo-controlled trial to try to prevent type 1 diabetes in high-risk relatives. Dr. Peter Chase has led the Colorado center, one of nine centers nationwide, to screen and enroll a fourth of the trial participants. Anyone who has lived with the disease will agree that it is better to prevent diabetes than to deal with the shots, blood sugar testing, diet, fear of hypoglycemia and ketoacidosis and eye, kidney, and heart diseases that so frequently occur in long-standing diabetes. Dr. Peter Gottlieb has recently initiated two trials in adults and children with newly diagnosed diabetes aiming at inducing full and lasting remission without need of insulin shots.

These trials and DPT-1 have become possible due to an explosion of knowledge about the causes and progression of childhood diabetes. Dr. Marian Rewers, the Clinical Division Director, directs
one of the studies that have been instrumental in learning the causes and risks of diabetes. The Diabetes Autoimmunity Study in the Young (DAISY) has screened for diabetes genes over 24,000 newborns from families where nobody has diabetes as well as over 1,500 young relatives of people with the disease. Those at risk have been followed for up to eight years to define the reasons why some children progress to diabetes while others are protected. Certain genetic backgrounds have been found to cause diabetes in up to 50% of children, while routine childhood immunizations, viral infections, and cow’s milk consumption have not been associated with diabetes. The project that involves also as investigators Drs. George Eisenbarth and Georgeanna Klingensmith, has been funded by the National Institutes of Health for another five years. Drs. Rewers and Eisenbarth teamed up also to study the occurrence of celiac disease (“wheat allergy”) in patient with type 1 diabetes. It turns out that 16% of the patients, including up to 30% of those with certain genes develop celiac disease. In 1998, based on these findings, the BDC Clinics have begun to screen routinely all patients for celiac disease and other associated conditions, e.g., autoimmune thyroid and adrenal diseases.

Dr. Satish Garg has evaluated in his studies a number of new insulins, novel ways to deliver insulin, blood sugar measuring devices and drugs that reduce the risk of long-term complication. In 2000, Drs. Rewers and Garg have initiated a study of early detection of heart disease in 1,400 adult patients with type 1 diabetes and their spouses/partners. The study, funded by the National Heart, Lung, and Blood Institute is pioneering the use of electron beam computed tomography in detecting microscopical calcification of coronary arteries. This powerful tool will be used to better define the genetic and metabolic causes of heart disease that is the underlying cause of death in nearly 80% of patients with childhood diabetes.

Drs. Klingensmith, Rewers, and Eisenbarth have been funded by the Centers for Disease Control to
register all children with diabetes in Colorado, Wyoming, New Mexico, and Arizona. This five-year long project will determine the characteristics of all patients that lived in the region in 2001 and those of all newly diagnosed children starting in 2002. The registry will help to understand if the incidence of childhood diabetes is increasing, and if so why. In addition, the patterns of access to care, its quality, and early complications will be determined.

An increasing number of children is being diagnosed with diabetes that resembles more that often seen in adults (type 2, non-insulin dependent). Drs. Georgeanna Klingensmith and Phil Zeitler will study this new epidemic in a series of studies designed to define the magnitude of the problem as well as the best ways to prevent and treat this type of childhood diabetes.

In other studies, Dr. Philip Walravens has recently evaluated metformin (Glucophage) and inhaled insulin as adjunct treatments for children with diabetes. Dr. William Jackson participates in a number of studies aiming at prevention of eye disease, Drs. Eisenbarth and Gottlieb study the Addison’s disease and cellular markers in patients with type 1 diabetes, and Drs. Chase and Garg pioneer clinical applications of a series of continuous glucose monitoring systems. Nearly every month a new clinical study that benefits both the participating patients and the progress of science is added to the Clinical Program at the BDC. The Translational Research Unit, supported by the Children’s Diabetes Foundation and headed by Drs. Rewers and Gottlieb puts special emphasis on translating the newest research discoveries into routine clinical care at the Center.

Research Program

A detailed overview of the Barbara Davis Center research program was presented in the Phase 1 Program Plan. A brief summary of that overview is presented below.

Basic science research at the Barbara Davis Center is directed at the prevention and cure of childhood diabetes and the prevention of diabetic complications and improved lives for those with the illness. Such a broad charge encompasses many areas of research with particular emphasis in the Research Division on understanding the immunologic etiology of childhood diabetes, defining the genes that cause the disorder, developing the means to predict diabetes, developing successful islet transplantation, and defining the developmental biology of islets with a long term goal the production of insulin producing islet cells from precursor cells. The Barbara Davis Center is in the forefront of investigation aimed at identifying the immune cells (lymphocytes) responsible for the pathogenesis of Type I diabetes and the molecular targets of these cells within the endocrine pancreas.

As indicated in Figure 5, over the past decade, funding for research at the Center has increased at almost a geometric rate with direct grant funding going from approximately $1.5 million to more than $4 million, including more than $3 million per year of National Institutes of Health (NIH) funding (an additional approximate $1.5 million of indirect support to the Campus). In addition, Center research is supported by grants from the Juvenile Diabetes Foundation and the American Diabetes Association. Additionally, more than $1.2 million per year for research is provided by the Children’s Foundation, the major philanthropic support of the Center. Recently, the Barbara Davis Center was one of three Diabetes Centers within the United States to be awarded an National Institutes of Health Diabetes Endocrine Research Center grant which will provide approximately $750,000 of direct funding and is designed to improve diabetes research throughout

University of Colorado Health Sciences Center
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GRANT SOURCES
RESEARCH DIVISION

Highlights of several major Center research efforts are provided below.

Research at the Center has found that a large proportion of T-cells that attack the pancreatic islets recognize a portion of the insulin molecule itself as a target structure. These studies conducted through the Research Division represent a clear demonstration of a defined islet-specific target structure involved in the pathogenesis of Type I diabetes. Another related arm of research at the Center focuses on islet cell transplantation as a treatment for existing Type I diabetes. Type I diabetes proves to be a formidable problem in the field of transplantation. In organ transplantation, such as with kidney or heart grafting, the transplant recipient must receive nonspecific chemical immunosuppressive drugs to prevent immune rejection of the transplant. These immunosuppressive agents have a number of potentially serious side effects, but are justified because the transplant is necessary to sustain life. However, Type I diabetes is not immediately life-threatening, and so the use of conventional immunosuppressive agents is not justified except in extreme cases where the Type I diabetic recipient is already receiving a kidney transplant due to renal failure.

One goal of research at the Center has been to develop islet cell transplantation using minimal recipient immunosuppression. A series of studies demonstrate that it is possible to transplant foreign islet tissue into animals without immune suppression by pretreating the donor islet tissue in order to reduce the ability of the tissue to elicit an immune reaction in the recipient. A further major problem in islet transplantation is that the autoimmune damage that produces the original damage in Type I diabetes may also recur in an islet transplant. Preliminary studies performed by investigators at the Center have indicated that islets transplanted into human Type I diabetic recipients are also destroyed by an immune response and that the underlying autoimmunity in Type I diabetes may be an important obstacle in human islet transplantation. As investigators get a better understanding of the immune cells that trigger islet destruction in this disease, our goal will be to apply this
understanding toward preventing the development of diabetes in patients who are at risk for the disease, and controlling the immune system recognition of islet transplants. Programs of investigation are also being developed in the area of the genetic manipulation of endocrine precursor cells with the view to supplying abundant sources of functional beta cells for therapeutic purposes once the problems of immune rejection have been solved.

As previously noted, in 1999, the University of Colorado Health Sciences Center was awarded an Autoimmunity Center of Excellence grant from the National Institutes of Health. This grant provides more than $1 million per year over four years to study a series of autoimmune disorders. This grant was submitted in collaboration with the Immunology Division of the Department of Medicine and the Barbara Davis Center. The scientific community in Denver, including investigators from the National Jewish Hospital, has one of the strongest programs in immunology in the world, and the awarding of this grant reflects this strength. A major purpose of the National Institutes of Health program is to foster collaboration between scientists and physicians tackling different autoimmune disorders to hasten the day that these diseases are cured and effectively treated.

Over the past two decades it has become apparent that Type 1 diabetes results from immune mediated destruction of the cells which produce insulin. When the immune system makes the mistake of attacking insulin-producing cells in a person who develops diabetes, it is likely to also cause other autoimmune disorders. These include thyroid disease, destruction of the adrenal gland (Addison’s disease), celiac disease (intestinal autoimmunity), pernicious anemia and multiple sclerosis. Specific projects in the Denver Autoimmunity Center from the Barbara Davis Center include trials for the prevention of diabetes in young children and discovering the genes which cause multiple autoimmune diseases in families, while developing state-of-the-art methods to detect the white blood cells which cause diabetes. Expertise both inside and outside of the Barbara Davis Center is necessary to carry out these studies, and a national network of investigators is being created to hasten progress.

The Research Division continues to expand as new opportunities arise and as funding sources continue to grow. The research group, which is one of the leading groups in the field, is now in the position to apply some of the basic since findings to the clinical setting. This phase of research development will require closer collaboration with the scientists at the Center and the new research facilities at Fitzsimons. Future growth of research and even continuation of current successful programs is dependent upon the availability of additional research space. All of the principal investigators at the Center are well funded with external grants and space has become a major limitation. Among these new initiatives include the following:

**Islet Developmental Biology**

Dr. Lori Sussel was recruited to the Center as an assistant professor with a major area of interest along with research director John Hutton in islet developmental biology. It is planned to recruit an additional faculty member in this area of endeavour, one in particular with an interest in developing the ability to produce in vitro large numbers of islet cells from stem cells. The long-term goal of such a project taking basic islet development research from the bench to the bedside is the production of islet cells for transplantation to cure diabetes.

**Clinical Islet Transplantation**

Dr. Ronald Gill heads an interdepartmental transplantation immunobiology group with individual
junior investigators and faculty from multiple departments and divisions including pediatric cardiovascular surgery, pulmonary, renal division, immunology department, etc. Pioneering basic studies of transplantation and recent developments in clinical islet transplantation lead us to believe that the next few years and next decade will be characterized by a practical and major national effort to cure Type 1 diabetes with islet transplantation. The Center envisions instituting clinical islet transplantation at the University of Colorado, with major research and clinical efforts.

**Genetics of Type 1 Diabetes and Organ Specific Autoimmunity**

At present researchers do not fully understand the genetic "blueprint" which leads to Type 1 diabetes and a series of related autoimmune disorders (e.g. celiac disease, Addison's disease, thyroid disease). With rapid developments in the genome project and a combination of one of the largest diabetes Centers in the world and basic immunologists and geneticists the Center has successfully begun to address the genetic etiology of Type 1 diabetes. For this effort expansion of sequencing and genotyping and just as important informatics capabilities will be expanded.

**Public Health Disease Prediction and Prevention**

National trials are currently underway aimed at the prevention of Type 1 diabetes. In animal models it is readily possible with a number of immunologic interventions to prevent diabetes, including vaccination with a series of islet autoantigens. Funding from the National Institutes of Health has been secured for the first trial of the primary prevention of anti-islet autoimmunity. Dr. Marian Rewers leads the DAISY study of the development of Type 1 diabetes in children from the general population followed from birth. The Center plans over the next decade a series of trials whose eventual goal is the prevention of autoimmune disorders in at risk populations.

The combined efforts of the research faculty and the clinicians and staff will continue to improve the understanding of diabetes mellitus and work towards its control and perhaps even – some day – its cure.

**Education**

The Center faculty continue to actively participate in a number of campus teaching activities. Medical students rotate through the Center on elective half-day rotations. Participants from the Child Health Associate Program, along with Endocrine Fellows, also rotate through the Center. Basic science faculty provide mentorship to predoctoral students (primarily in immunology research) and postdoctoral fellows from around the world.

The Barbara Davis Center for Childhood Diabetes has an active pre- and postdoctoral research training program which includes both basic and clinical scientists and covers a range of disciplines, including immunology, biochemistry, cellular and molecular biology, and population genetics. Studentships and fellowships are currently provided from NIH training grants in Immunology and Pediatrics, individual Juvenile Diabetes Foundation International Research Fellowships, and American Diabetes Association Career Development and Mentor-based Fellowship Awards. The Center also annually awards the O'Brien Physician-Scientist Fellowship Award and the Blum-Kovler Postdoctoral Research Award.
D. Relation to Academic or Institutional Strategic Plans

This program plan is consistent with the current institutional master plan and the clinical care, research, education, and community service missions of the University of Colorado Health Sciences Center. Specific UCHSC institutional planning, policies and facility program plans that relate to the Phase 2 project include:

1. **Barbara Davis Center at Fitzsimons (Phase 1) Program Plan (August 2000)**

   The program plan for the Phase 1 design and construction of the Barbara Davis Center at Fitzsimons was approved by the Board of Regents in August 2000 and the CCHE in January 2001. The approved Phase 1 project scope involves the construction of a new 50,902 gross square foot (gsf) facility of which 33,141 gsf (21,542 net assignable square feet (nasf)) is to be finished to house the research division of the Barbara Davis Center. The remaining 17,761 gsf/11,544 nasf of space to house the clinical programs will be constructed as shelled space during Phase 1 to be finished at a future date.

   During the program plan verification analysis completed in June 2002, in order to relocate all Center programs, the total Phase 1 space requirement was increased to 53,715 square feet.

2. **Institutional Master Plan Supplements (September 1999, August 2000, November 2001)**

   The University of Colorado Board of Regents approved the annual master plan supplements to the Institutional Master Plan of October 1998 in September 1999, August 2000 and December 2001. Both the Phase 1 construction of the new Barbara Davis Center facility at Fitzsimons and the Phase 2 fit-out project are consistent with the UCHSC’s mission as outlined in these Master Plan Supplements. The Health Sciences Center strives to “improve human health” through the education of health professions; the delivery of both health care and community services; and the advancement of knowledge through research in the health sciences. An international reputation for excellence in teaching, research, and service has been achieved by the UCHSC in fulfilling this mission. The UCHSC currently ranks in the top 20 among academic research institutions in the country in terms of extramural funding. During the past 10 years, funding for UCHSC’s sponsored programs has more than doubled - from $89.1 million in FY 1991 to $260.1 million in FY 2001.

3. **Institutional Master Plan (September 1998)**

   The institutional master plan for the University of Colorado Health Sciences Center, approved by the University of Colorado Board of Regents in October 1998 involves the development of a new campus at Fitzsimons to be developed in phases as a replacement to its current 46-acre campus located in east Denver. The Fitzsimons campus development involves a phased construction program totaling approximately five million square feet of new program space and associated infrastructure for the Health Sciences Center and University Hospital. This Phase 2 Barbara Davis Center project is consistent with the clinical mission of the UCHSC. The clinical
mission of the University of Colorado Health Sciences Center includes providing the highest quality health care for the citizens of Colorado and the region; serving disenfranchised patients as resources permit; providing a learning environment for the students of the schools of the Health Sciences Center; providing adequate patient volumes to support the clinical mission; and serving as the focal point for translation of scientific discovery into clinical practice.


The application for the public conveyance of 186 acres of land and properties at the U.S. Army Garrison, Fitzsimons, was approved by the Board of Regents and submitted in August 1997 to the U.S. Department of Education. The conveyance application was approved by the U.S. Department of Education in September 1997. The Barbara Davis Center project is consistent with the assumptions and guidelines of this conveyance.

E. Relation to Other Programs or Agencies

The Barbara Davis Center for Childhood Diabetes is managed as a distinct administrative unit of the School of Medicine. Its independent budget, fund raising and endowments provide a unique facility and resource for clinicians, clinician researchers and basic biomedical scientists working to help patients with type I diabetes.

The Center is partially funded by two major endowments from the Children's Diabetes Foundation and the Barbara Davis Center Research Trust. Additionally, all Center faculty are appointed in the School of Medicine in collaboration with appropriate department chairs. There is close collaboration with the other campus faculty, especially Immunology and Endocrinology.

F. Existing Programmatic/Operational Deficiencies

Both the future of the Barbara Davis Center, the growth of the Center's clinical programs and the maintenance of the standards of quality in clinical care depend upon the availability of new and expanded clinical and research space at Fitzsimons. The space made available by the completion of the Phase 2 project is necessary to house the clinical and clinical research programs of the Barbara Davis Center. To ensure the continued success of the Barbara Davis Center, it is necessary that all clinical and research program components be relocated to the new Fitzsimons facility by the end of the Phase 2 construction. Without the additional completed space, the Pediatrics Clinic and Eye Clinic will remain at the Ninth Ave. and Colorado Blvd. facility. This will result in a divided research and clinical program, negatively impacting the clinical and research missions and operations of the Center. The relocation the clinical programs to the new Barbara Davis Center facility also allow the Center’s programs to become an integral part of the activities and other programs of both the Health Sciences Center and of the University of Colorado Hospital. Additionally, a major portion of the clinical research program is now located in leased space off campus where it is not convenient for the faculty, practitioners, and patients to utilize.
G. Program Alternatives

Alternatives to the completion of the space in the new Barbara Davis Center facility at Fitzsimons include: (1) Continue to utilize the existing 9th and Colorado Blvd. to house the clinical and clinical research programs of the Center, (2) Lease off-campus space for the clinical programs. Neither of these alternatives allow the Barbara Davis Center to meet its operational needs and service objectives.

Continue Reuse of the Existing Facility for Clinical Program
As previously mentioned, this approach would result in a divided research and clinical program negatively impacting the clinical and research missions and operations of the Center. An essential planning assumption of this project is that all clinical and research program components of the Barbara Davis Center will be relocated to the new Fitzsimons facility at the end of the Phase 2 construction.

Lease of Space
This alternative would also result in an inefficient, split program and would perpetuate ongoing leasing expenses.

The Barbara Davis Center and its research and clinical programs are essential and unique assets to the UCHSC by 1) providing teaching experiences for medical students, endocrine fellows, child health associates, predoctoral research students and postdoctoral research fellows; 2) providing primary care and referral to children and adults with type 1 diabetes; 3) operating outreach programs in the Rocky Mountain region where physicians provide care and advice to patients in remote areas, and, 4) functioning as a unique research facility for basic science and clinical researchers working on the prevention, treatment and management of type 1 diabetes. The new Fitzsimons facility will allow the Center to increase the range of clinical services provided to children and adults and will allow research growth in the areas of autoimmunity and transplantation.

III. Facility Needs

A. Total Program Space Requirements

As shown in the following Table 1, the current program space inventory for Barbara Davis Center totals approximately 27,830 nasf (42,403 gsf). This includes 21,030 nasf (35,603 gsf) within the existing Barbara Davis Center facility at the 9th Ave. and Colorado Blvd. campus. The Center also leases an additional 6,800 square feet of space off campus to support several of its clinical research programs.

The Phase 1 Barbara Davis Center project, now underway, involves the construction of approximately 53,715 gross square feet of new space at the Fitzsimons site. This represents a total space inventory increase of approximately 27%. A total of 33,385 gross square feet (21,700 assignable square feet) is being constructed and will finished in June 2005 to house the Research Division programs. The core and shell of an additional 20,330 gross square feet (13,215 assignable square feet) needed to house the Clinical Division is also be designed and constructed during this
Table 1

<table>
<thead>
<tr>
<th>Program Space</th>
<th>Current Program - YR 2002</th>
<th>Future Program - Yr 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9th Ave Facility</td>
<td>Leased</td>
</tr>
<tr>
<td>Research</td>
<td>13,507</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>6,263</td>
<td>6,800</td>
</tr>
<tr>
<td>Building Support</td>
<td>1,260</td>
<td></td>
</tr>
<tr>
<td>Total NASF</td>
<td>21,030</td>
<td>6,800</td>
</tr>
<tr>
<td>Total GSF</td>
<td>35,603</td>
<td>6,800</td>
</tr>
</tbody>
</table>

first phase.

The Phase 2 project involves the fit-out of the remaining 20,330 gsf of shelled space. Both the future growth of the clinic and maintenance of the standards of quality in clinical care depend upon the availability of increased space. The Clinic is currently severely limited by a lack of space for new clinical staff. It is in this vein that expansion at Fitzsimons is essential to the future development of the clinical efforts. The Phase 2 project construction schedule will be coordinated with the Phase 1 project in order to complete and occupy all 53,717 gsf by June 2005.

Please refer to the Project Description Section of this document for a detailed listing of space requirements by phase and a conceptual diagram illustrating the interaction among the different program spaces within the new facility.

B. Unique or Special Features of Phase 2

The Barbara Davis Center is a clinical pediatric outpatient and research facility. The space to be completed will serve three clinical programs - the Pediatric Clinic, the Young Adult Clinic and the Eye Clinic and their associated clinical research programs. The clinic space must be designed for the comfort of young patients and their family members and to educate them about their disease. The clinical and clinical research areas should also have organizational and design plans which respond to the unique aspects of the Barbara Davis Center program. Program areas for clinicians, researchers, patients and their families should provide a domestic quality where patients and families from all over the world will spend visits for treatment and education. While meeting these humanistic qualities, the facility must also support the critical flow of patients, physicians and staff in a manner which support efficiencies of care.

The major goals for the Phase 2 space design include:

1. The space design should be efficiently organized for both clinical and clinical research that is both humanistic and operationally responsive to the multiple programs and overlying flows of operation - pediatrics, young adults, eye care, pediatric patient assessment, clinical research and
2. The clinical research space needs to be flexible and adaptive to respond to grant-based research and evolving research paradigms.

3. The space plan and design must be conducive to collaboration and sharing of research by the clinicians and research investigators.

C. Health, Life Safety and Code Requirements

The UCHSC has the overall jurisdiction for the project and will provide final interpretation on code issues. The campus requires that construction projects conform to the following codes and regulations. Unless otherwise indicated, the latest edition of listed codes and regulations will be used. There are no existing health, life safety or code issues as this is new construction.

The codes, regulations, and guidance documents that govern this project include:

- 1997 Uniform Building Code (UBC);
- 1997 Uniform Mechanical Code;
- 1997 Uniform Plumbing Code;
- 1997 Uniform Fire Code;
- 1997 Uniform Building Code Standards;
- 1997 National Electrical Code (NFPA No. 70);
- 1994 Life Safety Code (NFPA No. 101);
- National Fire Codes (13 Volumes by NFPA);
- American National Standards Institute Standard Safety Code ASME with Interpretations A17.1, A17.3, A17.5, QEI-1 (most recent);
- C.R.S. (Colorado Revised Statutes) Volume 3B – Title 9, Article 2 – Safety Glazing Materials;
- 1991 Americans with Disabilities Act;
- 1997 Uniform Code for Building Conservation;
- Uniform Federal Accessibility Standards (UFAS).
- University of Colorado Construction Regulations and Standards
- City of Aurora Fire Department
- Colorado Department of Public Health (EPA)
- ANSI A117.1 - Providing Accessibility and Usability for Physically Handicapped People,
- NFPA 30 - Flammable and Combustible Liquids Code.
- NFPA 45 - Fire Protection for Laboratories using Chemicals.
- OSHA Standard 29/ CFR 1910.1450 - Occupational exposures to hazardous chemicals in
laboratories

D. Site Requirements

Not applicable to this Phase 2 project scope.

The discussion of site requirements of the new Barbara Davis Center at Fitzsimons was included in the Phase 1 program plan document. A site map showing the location of this facility is included in the Appendix.

The Barbara Davis Center is located on the University of Colorado’s Fitzsimons campus. The campus Master Plan has designated zones for development of facilities by predominating use. The facility is sited in the research zone immediately adjacent to the Research Complex 1 facility. The new Anschutz Center for Advanced Medicine, Cancer Center and Eye Institute are located in the adjacent clinical zone to the south. The infrastructure development to meet the needs of the new facility is now underway.

E. Equipment Requirements

Capital costs for equipment and furnishings for the space to be completed in Phase 2 consist primarily of moveable equipment and furnishings for the clinical examination rooms, patient education and consultation rooms, procedure rooms, patient reception and waiting areas, the large conference room, the play room, and faculty and clinician offices. It is assumed the 17% of the total project of this Phase 2 project will be allocated for conventional furnishings and equipment. Included under the category of conventional furnishings and equipment are clinical examination tables, lighting units, staff and clinician workstations, data drops/electrical outlets, wired furniture, and security equipment.

It is assumed that medical information and records are to be completely electronic - full access to electronic medical information will be available in every examination/treatment, consultation, procedure and teaching room. Special equipment includes the acquisition of technology for the clinical examination, patient education and consulting rooms.

Specialized procedural clinical and research equipment, including eye lasers, photography equipment and echography units are not included in the project budget.

F. Acquisition of Real Property

All property pertaining to the Barbara Davis Center facility development is already University of Colorado (State of Colorado) property. There is no need for the acquisition of additional lands, buildings, or properties for this project.
IV. Project Description

A. Phase 2 Project Scope

As previously stated, the Program Plan for the $16.7 million, Phase 1 development of a new facility for the Barbara Davis Center at Fitzsimons was approved by the University of Colorado Board of Regents in August 2000, and the Colorado Commission on Higher Education (CCHE) in January 2001. The concept project design was initiated in June 2002. The requirement for the Phase 1 project design is the development of a 53,715 gross square foot facility, to be constructed for the approved program plan budget of $16,737,941. The Phase 1 project goal is to construct and finish as much of the 53,715 gsf of the research and clinical space as possible at the approved Phase 1 project budget.

The Phase 2 project, proposed in this program plan, involves the fit-out/finishing of all interior space that is not completed in the Phase 1 project. It is an assumption of this Phase 2 program plan that the total amount of space needing to be finished will total approximately 20,330 gsf (13,125 nasf). The project cost for finishing and equipping this shell space as clinical space is estimated to total $3.395 million and will funded by cash funds. The project construction schedule for the Phase 2 project is coordinated with the Phase 1 construction schedule with completion and occupancy of the entire 53,715 gsf anticipated for June 2005.

During the program plan verification process completed as part of the Phase 1 project design work, the program space requirements and facility phasing assumptions of the Phase 1 program plan were reviewed by the project oversight committee. In order to sufficiently accommodate the clinical and research program relocation, the Phase 1 facility space plan was revised from a previous total of 50,902 gsf to a new total building requirement of 53,715 gsf.

Other project assumptions which were revised and/or emphasized during the program plan verification include the following:

1. In order to accommodate the clinical program relocation, the total Phase 1 program space plan was increased from 33,086 nasf (50,902 gsf) to 34,915 nasf (53,715 gsf). The design requirement for the Phase 1 project is the development of a 53,715 gsf facility, to be constructed at the approved program plan budget of $16,737,941.

2. The building will be massed, sited, and phased in such a way to accommodate a long-term development need of 100,000 gsf over the next 20 - 25 year period.

3. The Phase 1 project goal is to finish as much of the 53,715 gsf of research and clinical space as possible for the approved budget $16,737,941.

4. The Phase 2 project goal is the finish of the Phase 1 shell space. It is assumed that the remaining space will total 13,125 nasf.

5. The research laboratories to be constructed during the Phase 1 project are to be modular and open to maximize flexibility. Support alcoves adjacent to lab modules are still desirable.
6. The clinical space will be organized around three practice clusters - pediatrics, young adult and the eye clinic.

7. Medical information is to be completely electronic - full access to electronic medical information will be available in every examination/treatment room.

8. The need for an exterior play yard requirement, as identified in the Phase 1 program plan, has been deleted from the revised program space plan.

9. Barbara Davis Center patients are assumed to be ambulatory.

10. Patient comfort, convenience, and safety must be major considerations in the facility planning and design.

11. The building design will include a single building grand lobby to support both the clinical and research divisions.

12. The three clinical program clusters may provide opportunities for shared administrative support.

13. Special identity may be promoted within the clusters and appropriately segregated patient waiting, faculty office, and staff support areas will be developed.

14. Clinical faculty and staff offices will be located in proximity to the exam/treatment areas.

15. Semi-separated reception areas will be available for the three clinical practice clusters.

16. The translational research areas will require a separate reception area.

17. Adjacent building patient parking must accommodate 25 vehicles. This requirement will be reviewed during the design process. The plan assumes that faculty and staff parking will be accommodated in other campus supported parking facilities.

This Phase 2 project involves the finish the shell space as new clinical program and related building support space. Specific room planning design and system requirements will be identified during the Phase 1 design process.

A detailed listing of all program space by program division and by project phase is presented in the following Table 2.

Additionally, a diagram illustrating the essential adjacency relationships for the Fitzsimons facility is also provided in Figure 6.
### Research Division

<table>
<thead>
<tr>
<th>Type</th>
<th>#</th>
<th>sqft</th>
<th>Total sqft</th>
<th>Lab ID</th>
<th>Lab Code</th>
<th>Type</th>
<th>#</th>
<th>sqft</th>
<th>Total sqft</th>
<th>Lab ID</th>
<th>Lab Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>1</td>
<td>800</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lab Supplies</td>
<td>1</td>
<td>800</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry Support</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glassware</td>
<td>1</td>
<td>300</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Paper supplies</td>
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<td>200</td>
<td>200</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Laboratory</td>
<td>3</td>
<td>150</td>
<td>450</td>
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<td></td>
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<td></td>
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<td></td>
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<td>Equipment</td>
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<td>100</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals</td>
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<td>200</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Furniture</td>
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<td></td>
</tr>
<tr>
<td>Ashtray</td>
<td>1</td>
<td>300</td>
<td>300</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>3</td>
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<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conference Room</td>
<td>1</td>
<td>200</td>
<td>200</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

### Clinical Division

<table>
<thead>
<tr>
<th>Type</th>
<th>#</th>
<th>sqft</th>
<th>Total sqft</th>
<th>Lab ID</th>
<th>Lab Code</th>
<th>Type</th>
<th>#</th>
<th>sqft</th>
<th>Total sqft</th>
<th>Lab ID</th>
<th>Lab Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

### Total Research Division

16,999 sqft

### Total Clinical Division

16,478 sqft

### Total

33,477 sqft
<table>
<thead>
<tr>
<th>Department</th>
<th>Full-Time Equivalent (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic</td>
<td>1</td>
</tr>
<tr>
<td>Administration</td>
<td>1</td>
</tr>
<tr>
<td>CAFR</td>
<td>1</td>
</tr>
<tr>
<td>Finance</td>
<td>1</td>
</tr>
<tr>
<td>Human Resources</td>
<td>1</td>
</tr>
<tr>
<td>Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>Operations</td>
<td>1</td>
</tr>
<tr>
<td>Physical Facilities</td>
<td>1</td>
</tr>
<tr>
<td>Total Personnel</td>
<td>14</td>
</tr>
</tbody>
</table>

**Total Full-Time Equivalents (FTE):**

14

---

**Total Clinical Officers:**

1,700

---

**Total Office Departments:**

4,300

---

**Total Clinical Division:**

12,610

---

**Total Clinical Officers:**

3,000

---

**Total Personnel:**

1,200
B. Project Cost Estimate

The capital construction budget for the Phase 2 space completion is $3,395,371. The sources of these costs are professional estimating resources as well as recent experiences with actual construction costs of the University of Colorado Health Sciences Center with projects under construction on the Fitzsimons campus. The project is a cash project without contribution of state capital funds and will be funded by cash and gifts. The estimated project cost is detailed in the following Table 3.

| Table 3 |

**Capital Construction Budget**  
**Barbara Davis Center - Phase 2**

<table>
<thead>
<tr>
<th>A. Land Acquisition:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Purchase Cost</td>
<td>$0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Professional Services:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Surveys, Investigative Reports</td>
<td>$0</td>
</tr>
<tr>
<td>Architectural/Engineering/Basic Services</td>
<td>$375,213</td>
</tr>
<tr>
<td>Code Review/Inspection</td>
<td>$37,521</td>
</tr>
<tr>
<td>Construction Management</td>
<td>$93,521</td>
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<tr>
<td><strong>Total Professional Services</strong></td>
<td><strong>$506,537</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Construction:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td></td>
</tr>
<tr>
<td>(a) Services/Utilities</td>
<td>$0</td>
</tr>
<tr>
<td>(b) Site Improvements</td>
<td>$0</td>
</tr>
<tr>
<td>New Construction (Finish 2,330 gsf)</td>
<td>$1,876,063</td>
</tr>
<tr>
<td><strong>Total Construction Costs</strong></td>
<td><strong>$1,876,063</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. Equipment and Furnishings:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment and Furnishings</td>
<td>$579,524</td>
</tr>
<tr>
<td>Communications</td>
<td>$128,695</td>
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<tr>
<td><strong>Total Equipment &amp; Furnishings Costs</strong></td>
<td><strong>$708,219</strong></td>
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</table>

<table>
<thead>
<tr>
<th>E. Miscellaneous:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Art in Public Places</td>
<td>$0</td>
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<tr>
<td>Relocation</td>
<td>$125,000</td>
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<tr>
<td><strong>Total Miscellaneous Costs</strong></td>
<td><strong>$80,902</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>F. Project Contingency</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Project Contingency 5%</td>
<td>$179,552</td>
</tr>
<tr>
<td><strong>Total Contingency</strong></td>
<td><strong>$179,552</strong></td>
</tr>
</tbody>
</table>

| **Total Project Budget**    | $3,395,371 |

<table>
<thead>
<tr>
<th><strong>Source of Funds</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Funded Exempt (CFE)</td>
<td>$3,395,371</td>
</tr>
</tbody>
</table>
Cost Effects of Project Delay

Construction and equipment purchasing costs can increase at rates from 0% to 10% per annum. In recent years, costs increases have often been in the range of 3% to 5%. Any delay in commencing this project would probably result in increased costs of this magnitude.

Operating Costs

Provided in the following Table 4 is a summary of anticipated facility operating costs for the new Fitzsimons facility. The annual facility operating costs for the clinical space within the new facility with a July 2005 occupancy are projected at $140,590. The current annual lease cost for the clinical research space at 4495 Hale Parkway, Denver, is $131,467. When the project is complete, this lease cost will be eliminated.

C. Life Cycle Cost Analysis

A life cycle cost analysis for the new Center facility was included in the approved Phase 1 program plan and is omitted in this Phase 2 plan document.

D. Financial Analysis

Provided in Tables 5 and 6 are the clinical program operating plan projections. As indicated, the clinical staff currently totals 68 FTE at an total operating budget of $6.382 million. The operating plan projects an annual increase of 2 FTE and with a total clinical staff requirement of 74 FTE in the Year 2005. The projected Year 2005 operating budget is $8.040 million.

In regards to the capital project, the Phase 2 project is a 100% cash funded project with funds derived from gifts. The following Table 7 indicates the funding source for the capital development costs.
# Table 4

**University of Colorado Health Sciences Center**  
Barbara Davis Center for Childhood Diabetes - Phase 2 Program Plan

## Projected Facility Operating Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>9th Avenue Campus</th>
<th>Fitzsimons Campus</th>
<th>Fitzsimons Campus Over (Under) 9th Avenue Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Cost Per GSF</td>
<td>Research Program</td>
<td>Total Facility</td>
</tr>
<tr>
<td>Projected Facility Operating Costs: GSF On-Campus</td>
<td>22,853</td>
<td></td>
<td>35,603</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>$1.66</td>
<td>$37,936</td>
<td>$59,101</td>
</tr>
<tr>
<td>Building Maintenance &amp; Repair</td>
<td>$2.00</td>
<td>$45,706</td>
<td>$71,206</td>
</tr>
<tr>
<td>Utilities</td>
<td>$2.13</td>
<td>$48,677</td>
<td>$75,835</td>
</tr>
<tr>
<td>Grounds</td>
<td>$0.10</td>
<td>$2,285</td>
<td>$3,560</td>
</tr>
<tr>
<td>Environmental Health &amp; Safety</td>
<td>$0.79</td>
<td>$18,054</td>
<td>$28,127</td>
</tr>
<tr>
<td>Police</td>
<td>$0.56</td>
<td>$12,798</td>
<td>$19,938</td>
</tr>
<tr>
<td>Liability &amp; Property Insurance</td>
<td>$0.22</td>
<td>$5,028</td>
<td>$7,833</td>
</tr>
<tr>
<td>Total On-Campus</td>
<td>$7.46</td>
<td>$170,484</td>
<td>$265,600</td>
</tr>
<tr>
<td>Hale Parkway Lease - Clinical Space:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF Off-Campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Cost (Savings)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Lease End Date - 12/31/05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAND TOTAL Square Feet</td>
<td>22,853</td>
<td>42,403</td>
<td>30,892</td>
</tr>
<tr>
<td>Facility Operating Costs (Savings)</td>
<td>$170,484</td>
<td>$397,067</td>
<td>$190,296</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>FTE</td>
<td>$</td>
<td>FTE</td>
</tr>
<tr>
<td>Clinical Program Expenses:</td>
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</tr>
<tr>
<td>Ophthalmology Clinic</td>
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<tr>
<td>Pediatric Clinic</td>
<td>29.00</td>
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</tr>
<tr>
<td>Shared Clinic</td>
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<td>7.50</td>
</tr>
<tr>
<td>Young Adult Clinic</td>
<td>18.00</td>
<td>$1,602,572</td>
<td>18.00</td>
</tr>
<tr>
<td>Clinical Research</td>
<td>10.50</td>
<td>$1,065,751</td>
<td>12.50</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>68.00</td>
<td>$6,382,932</td>
<td>70.00</td>
</tr>
</tbody>
</table>
### TABLE 6

**UNIVERSITY OF COLORADO HEALTH SCIENCES CENTER**

*Barbara Davis Center for Childhood Diabetes - Phase 2 Program Plan*

Projected Funding Sources for the Clinical Program Operating Plan

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>Increase</td>
<td>Estimate</td>
<td>Increase</td>
<td>Estimate</td>
</tr>
<tr>
<td>330 Restricted Fund Exempt Grants, Contracts, Gifts</td>
<td>$4,641,032</td>
<td>$4,943,567</td>
<td>$321,635</td>
<td>$341,486</td>
<td>$5,687,656</td>
</tr>
<tr>
<td>380 Agency Fund Exempt UPI</td>
<td>$1,721,000</td>
<td>$1,910,000</td>
<td>$189,000</td>
<td>$210,000</td>
<td>$2,353,000</td>
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<tr>
<td><strong>TOTAL CASH FUNDS</strong></td>
<td><strong>$6,362,032</strong></td>
<td><strong>$6,893,567</strong></td>
<td><strong>$510,635</strong></td>
<td><strong>$551,486</strong></td>
<td><strong>$8,040,656</strong></td>
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<tr>
<td>COFRS Fund</td>
<td>Fiscal Yr 2003-2004</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>330 Restricted Fund Exempt</td>
<td>$3,395,371</td>
<td>$3,395,371</td>
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<td></td>
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</tr>
<tr>
<td>Gift Giving</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
E. Project Schedule

The information below reflects the project implementation schedule for the design and construction of the Barbara Davis Center - Phases 1 and 2. The Phase 2 project schedule will coincide with the construction of the Phase 1 project with completion anticipated for June 2005. As a result of this requirement, the initial design work for Phase 2 space will be incorporated into the Phase 1 design process.

<table>
<thead>
<tr>
<th>Project Activity</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1</strong></td>
<td></td>
</tr>
<tr>
<td>Phase 1 Program Plan</td>
<td></td>
</tr>
<tr>
<td>Regent Approval</td>
<td>August 2000</td>
</tr>
<tr>
<td>CCHE Approval</td>
<td>January 2001</td>
</tr>
<tr>
<td>Legislative Authorization</td>
<td>June 2001</td>
</tr>
<tr>
<td>Architect Selection</td>
<td>January 2002</td>
</tr>
<tr>
<td>Plan Verification</td>
<td>March 2002 - May 2002</td>
</tr>
<tr>
<td>Design</td>
<td>June 2002 - October 2003</td>
</tr>
<tr>
<td>Construction Completion</td>
<td>June 2005</td>
</tr>
<tr>
<td>Occupancy</td>
<td>July 2005</td>
</tr>
<tr>
<td><strong>Phase 2</strong></td>
<td></td>
</tr>
<tr>
<td>Phase 2 Program Plan</td>
<td>August 2002</td>
</tr>
<tr>
<td>Regent Approval</td>
<td>May 2003</td>
</tr>
<tr>
<td>Legislative Authorization</td>
<td>July 2003 - October 2003</td>
</tr>
<tr>
<td>Design</td>
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</tr>
<tr>
<td>Construction Completion</td>
<td>July 2005</td>
</tr>
<tr>
<td>Occupancy</td>
<td></td>
</tr>
</tbody>
</table>

V. Relation to Master Plan/Other Projects

The Barbara Davis Center for Childhood Diabetes is a tremendous asset to the Health Sciences Center and the University of Colorado by providing teaching experiences for medical students, endocrine fellows, child health associates, predoctoral research students and postdoctoral fellows; providing primary care and referral services to children and adults with Type 1 diabetes; operating outreach programs in the Rocky Mountain Region where physicians provide care and advice to patients in remote areas, and functioning as a unique research facility for basic science and clinical researchers working on the prevention, treatment and management of Type 1 diabetes. The construction and completion of the new Barbara Davis Center facility at Fitzsimons is consistent with the clinical care, research, education, and community service missions of the as outlined in the 1998 Institutional Master Plan. The subsequent annual updates to the Master Plan of the Health Sciences Center have also continued to address the need for this completed facility.
The vision of the new campus at Fitzsimons includes the development of facilities that will enable new ways in which faculty, students, and staff will conduct their duties in the 21st century. In the new Barbara Davis Center facility at Fitzsimons, research space will integrate with clinical and translational research space to encourage a more effective flow of new discoveries to their application for the benefit of the patient and the community at large. Proximity of the Barbara Davis facility to the other new clinical research and vivarium facilities at Fitzsimons will also provide increased opportunities for program interaction and partnership among UCHSC researchers and clinicians.

VI. Project Alternatives

Two project alternatives have been presented in an earlier section. The alternatives to the completion of the Phase 2 space in the new Barbara Davis Center facility at Fitzsimons include: (1) Continue to utilize the existing 9th and Colorado Blvd. to house the clinical and clinical research programs of the Center, (2) Lease off-campus space for the clinical programs. Since the result of these alternatives result in the division of the clinical and research programs on two sites, and possible additional lease expenses, neither of the alternatives are considered viable.

VII. Appendices

A. Site Map
B. CCHE Approval for Barbara Davis Center, Phase 1
C. Third Party Review
University of Colorado Health Sciences Center

Program Plan for the
Barbara Davis Center at Fitzsimons - Phase 2

July 5, 2002

Appendix

A. Site Map
BARBARA DAVIS CENTER AT FITZSIMONS
University of Colorado Health Sciences Center

Program Plan for the
Barbara Davis Center at Fitzsimons - Phase 2

July 5, 2002

Appendix

B. CCHE Letter of Approval - Phase 1
January 30, 2001

Dr. James Shore  
Chancellor  
University of Colorado-Health Sciences Center  
4200 East Ninth Avenue  
Denver, Colorado 80262

Dear Chancellor Shore:

The Colorado Commission on Higher Education has statutory authority to approve building program plans under 23-1-106 (3), C.R.S.

Approval of the University of Colorado Health Sciences Center-Fitzsimons Campus - Barbara Davis Center for Diabetic Research ($16,737,941 CFE or 50,902 gsf of new construction) is consistent with:

1. The statutory role and mission for the University of Colorado Health Sciences Center as stated in 23-20-101 (d);

2. The University of Colorado Health Sciences Center Facilities Master Plan for the Fitzsimons site that CCHE approved December 1998;

3. The approval of the Board of Regents of the University of Colorado May 2000; and

4. The Institutional 5-Year Capital Improvements Program Schedule for 2001-2002 through 2005-2006; WITH THE UNDERSTANDING THAT:

5. The University of Colorado Health Sciences Center will develop a succinct plan that outlines future controlled maintenance considerations for facilities for University of Colorado Health Sciences Center at Fitzsimons as a whole. The plan should be developed and monitored as the remaining cash- and State-funded projects are approved and built. The plan should encompass the level of growth requested and show how maintenance will occur for both cash- and State-funded buildings.
The following points should be considered:

- This project has good planning in place for the future. It is developed in two phases to economically accommodate patient increases in future years.

- Some spaces are planned to meet current requirements with necessary considerations for how research and its requirements may change. This research area is one that has long-term implications, so devoting a facility to the specific needs is appropriate.

- The current plan is very efficient in terms of gross square feet to assignable square feet.

- Statistics on the current and projected high level of research volume support the need for the square footage proposed.

The CCHE staff analysis is enclosed. Please contact Laureen Ferris at 303-866-2723 if you have additional questions.

Sincerely,

Jeanne M. Adkins
Director, Policy and Planning

cc: Teresa Wilson, OSPB
    Eric Kurtz, JBC
    Amy Zook, CBC
    Larry Friedberg, State Buildings

cc/enc: John Allison, UCHSC
        Denise Brown, UCHSC
        Program File
University of Colorado Health Sciences Center

Program Plan for the
Barbara Davis Center at Fitzsimons - Phase 2

July 5, 2002

Appendix

C. Third Party Review
H+L Architecture
July 17, 2002

Mr. Jerry Scezney
Office of Institutional Planning
University of Colorado Health Sciences Center
Building 500, Fitzsimons Campus
Denver, CO 80262

Re: Program Plan - 3rd Party Review
Program Plan for the Barbara Davis Center at Fitzsimons – Phase 2

Dear Jerry:

The following represents our third party review of the University of Colorado Health Sciences Center Program Plan dated 5 July 2002 for the Barbara Davis Center at Fitzsimons – Phase 2.

Our review comments focused on four topics:
- Conformance with Facilities Master Plan
- Feasibility of Concept
- Applicable Codes
- Reasonableness of Cost Estimate.

CONFORMANCE WITH FACILITIES MASTER PLAN
The University of Colorado Health Sciences Center has developed a Facilities Master Plan for the 217 acre Fitzsimons Campus. The University of Colorado Board of Regents approved the annual master plan supplements to the Institutional Master Plan of October 1998 in September 1999, August 2000 and December 2001. Both the Phase 1 construction of the new Barbara Davis Center facility at Fitzsimons and the Phase 2 project are consistent with the UCHSC mission as outlined in these Master Plan Supplements.

The Program Plan – Phase 1 contains approximately 53,715 gross square feet at the Fitzsimons campus to house the research division and translational research programs of the Barbara Davis Center. The estimated budget for the Phase 1 project was $16.7 million. Phase 1 will construct 33,385 GSF of finished space. The remaining 20,330 GSF of space will be constructed in Phase 1 as sheled space to be completed during the Phase 2 project.

The Phase 2 project involves the fit-out and finishing of this space for the clinical program division of the Center. The Phase 2 project cost is estimated to total $3.395 million and is proposed as an entirely cash-funded project. The Phase 2 project construction schedule will be coordinated with the Phase 1 development schedule. Completion and occupancy of the entire 53,715 GSF building is anticipated in June 2005. The new Barbara Davis Center is to be located in the Fitzsimons campus research zone on the site south of Building 500 and east of the new Research Complex 1.

FEASIBILITY OF CONCEPT
This Project is proposed as a second phase of new construction to be completed consistent with Phase 1 of the Barbara Davis Center.
The proposed project building elements include construction (now underway) of approximately 53,715 GSF of new space. A total of 33,385 GSF is being constructed and will be finished in June 2005 to house the Research Division Programs. The core and shell of an additional 20,330 GSF is needed to house the Clinical Division. The Barbara Davis Center is a clinical pediatric outpatient and research facility. The space to be completed will serve three clinical programs – the Pediatric Clinic, the Young Adult Clinic and the Eye Clinic and their associated clinical research programs.

The Phase 2 project goal is the finish of the Phase 1 shell space. Program areas for clinicians, researchers, patients and their families will include laboratory support spaces, offices, and clinical/examination spaces totaling 13,125 NASF.

APPLICABLE CODES
The proposed additions and upgrades will be required to comply with all applicable codes, regulations, laws and ordinances as well as standards adopted by UCHSC. These requirements are identified in a section for Applicable Codes and Standards and, in our opinion, are applicable and consistent with the campus standards and necessary approvals.

REASONABLENESS OF COST ESTIMATE
The project budget for Phase 2 construction is estimated to total $3.335 million. The proposed center will be financed completely with cash funds and could be ready for occupancy in June 2005.

Cost estimates and bids that have been received recently indicate that new construction falls within the assumptions that have been made in this Program Plan. Given the present construction market, the high level of construction activity in the Front Range, and the high degree of cost variances for technology, the cost estimate contained in the Program Plan is considered to be sufficient.

Subject to the comments above, the Program Plan appears to be a reasonable solution to accommodate the Phase 2 Barbara Davis Center project proposed for the UCHSC Fitzsimons Campus.

If you have questions regarding this review, please do not hesitate to contact us at your earliest convenience.

Sincerely,

H+L ARCHITECTURE, LTD., AIA

Michael E. Ossian, AIA
Principal

MEO/jkhk