January, 2004

To Governor Sanford and the General Assembly:

On behalf of the Board of Directors of the Diabetes Initiative of South Carolina, (DSC), I am pleased to present our ninth annual report. This report was requested in Chapter 39, Section 44-39 of the Diabetes Initiative of South Carolina Act.

Recent data about diabetes in South Carolina are sobering. We rank 2nd in the United States in prevalence of known diabetes in adults (8.5% = 240,000). There are at least 120,000 more adults who have diabetes but do not know it. There is increasing recognition that a condition called impaired glucose tolerance (IGT) places an individual at high risk to develop diabetes and, especially, cardiovascular complications. Nationally, 15.6% of adults have IGT; for S.C., this would mean 460,000 people. Therefore, it is estimated that a total of 820,000 adults in S.C. (27% of the population) have diabetes or are at very high risk for the disease and its vascular complications. The rates of major complications of diabetes (heart attacks, amputations, endstage renal disease) are increasing in our state at rates of 20 -27% since 1994. Total yearly cost of diabetes is in excess of $850 million in South Carolina.

In recognition of this major health problem, the Diabetes Initiative Board has developed a long range Strategic Plan, which defines 9 major goals and specific steps to be taken to combat this devastating disease. This Annual Report analyzes progress made towards Goals I-III of the Strategic Plan. Ongoing Surveillance is documenting the impact of the many programs we have developed. We are seeing encouraging trends in many areas since the Diabetes Initiative was started. Specific risk markers and guidelines for care are now utilized by health care providers and people with diabetes. We are confident that this Initiative will eventually reduce costs of care, result in fewer complications and establish an improved quality of life for people with diabetes in our state. These changes will occur gradually in this chronic disease, predictably over the next 2–3 decades.

We are pleased to report that this Initiative has had extraordinary success in helping to develop proposals, which have generated substantial extramural support directed at problems associated with diabetes. For 2003, this outside support is more than 20 times the yearly allocation by the state for the Diabetes Initiative of South Carolina.

We are enthusiastic that the Diabetes Initiative of South Carolina will be successful in combating this serious disease by its innovative programs of community outreach, education, and surveillance. We are grateful to the General Assembly for establishing this Initiative and sincerely hope that you will find that this report is responding to the needs of the people in South Carolina

John A. Colwell, MD, PhD
Chair, Diabetes Initiative of South Carolina Board

JAC/pst
Executive Summary

This Annual Report for calendar year 2003 is an analysis of 5 years of progress by the Diabetes Initiative of South Carolina towards the goals and objectives of our 10 Year Strategic Plan (1998 – 2008). The Report provides a historical background for the creation of the Diabetes Initiative of South Carolina, a Mission Statement, an outline of the Strategic Plan, and summarizes state as well as extramural grant funding in support of the Initiative. We have analyzed progress towards the first 3 goals of the plan.

The first goal is to improve knowledge of diabetes, quality of life, and access to prevention and intervention services for people at risk and those affected by diabetes.

Substantial progress has been made in addressing the first major goal of this 10 Year Plan. Two programs of the Healthy South Carolina Initiative of M.U.S.C. have successfully instituted lifestyle interventions that are reducing risks for diabetes complications. A major education program at the 6 Historically Black College Universities introduces undergraduate students to the seriousness of diabetes, hypertension, and obesity and provides methods and rationale to address these issues for students interested in health professional careers. The structure of the Diabetes Initiative allows for frequent interchange and supports the development of health promotion programs through the auspices of the Diabetes Control Program, S.C. DHEC, the American Diabetes Association, and Carolina Medical Review. Legislation mandating coverage for equipment, supplies, and outpatient self-management training for diabetes has been passed, and minimal standards of care have been established by the Diabetes Initiative of South Carolina. Programs to decrease cost barriers for underserved people with diabetes are operative and are accomplishing impressive results.

The second goal is: to increase the utilization of short-term (surrogate) measures that lead to actions that will delay progression of complications of diabetes.

There has been very good progress towards increasing utilization of surrogate measures which should lead to actions to delay progression of the complications of diabetes. First, there has been a major increase in the number of programs of public awareness. Second, primarily due to a concerted effort to develop model diabetes education programs around the state, and the subsequent adoption of these to qualify for certification by the ADA, we now have 51 ADA approved sites in South Carolina. This is a remarkable increase from 3 sites in 1996. Next, there is evidence from a variety of sources that utilization of key surrogates has increased. Examples include yearly HbA1C, eyes or foot examinations, lipids, vaccinations for influenza or pneumonia, and formal patient education. Preliminary information from several programs indicate that intensive management programs are achieving stringent goals of therapy, including control of HbA1C, blood pressure, lipids and utilization of Ace inhibitors and aspirin therapy as cardio protective strategies.

Predictably, if these promising trends continue, we will eventually see a gradual drop in the incidence of serious eye disease, amputations, myocardial infarctions, and endstage renal disease. It is recognized, however, that many years of intensive management will be necessary before significant improvement in morbidity and mortality can be expected.

The third goal is: to address the needs of persons at risk and those with diabetes by increasing services and education in health professional shortage areas in South Carolina.

We have made substantial progress in addressing the third major goal. The numbers of trained health care personnel have increased remarkably between 1995 and 2002. There has been at least a doubling of trained physicians in 6 of 8 critical specialties and a 75% increase in two. In the non-physician category, the numbers of certified diabetes educators and physicians assistants have tripled, and we now have 94 specially trained pharmacists in diabetes, where some existed previously. In view of the
increasing complexity of multi-factorial management of people with diabetes, the team concept of management is increasing. To complement the increase increased numbers of health care personnel, successful professional education programs are ongoing. A key resource has been 2 separate publications of Office-Based Diabetes Management for Primary Health Care Providers and its distribution to over 3600 practitioners. The Diabetes Initiative of S.C. has collaborated with the Department of Family Medicine in highlighting diabetes in its innovative third year medical student rural primary care experience. Finally, major extramural support has now been guaranteed for a variety of community oriented programs and clinical research projects which will increase knowledge and support improved medical care for people with diabetes in South Carolina.

We conclude that a successful state wide collaborative effort has been created by the Legislature to address the needs of people affected by diabetes in South Carolina: The Diabetes Initiative of South Carolina. We are pleased with the progress of this unique combination of public and private resources as well as Federal, State, and local support in the battle against diabetes mellitus, a major public health problem.
The Diabetes Initiative of South Carolina

**HISTORICAL BACKGROUND**

In 1991, the Division of Diabetes Translation, Centers for Disease Control, Atlanta, Georgia, published updated trends in diabetes and in diabetic complications in the United States, between 1980 and 1989. Major trends included an increasing prevalence of diabetes and increasing hospitalization rates among diabetic individuals for the serious complications of amputations, end stage renal disease, myocardial infarctions and cardiovascular death. The prevalence of diabetes was doubled in blacks when compared with whites. There was an increase in all major cardiovascular complications among blacks with diabetes. Diabetes was the leading cause of blindness among adults, and women with diabetes were at an increase risk for adverse outcomes of pregnancy.

There issues were magnified in South Carolina, relative to most other states in the United States. Diabetes prevalence was estimated at 6.1%, 5th among 38 states surveyed. Diabetes as a contributor to mortality was increasing in incidence in South Carolina and diabetes accounted for approximately 11% of hospital admissions. Overall, 14% of hospital beds were occupied by people with diabetes. Longitudinal data in the decade of 1980-1990 revealed increases in the prevalence of excess weight, self-reported hypertension and high blood cholesterol in individuals known to have diabetes. Hospitalization rates for renal failure, amputation, and myocardial infarction were increasing and the mortality rate for diabetes as one of the listed causes of death in South Carolina was steadily rising, from 50.7/100,000 population in 1980 to 71.1/100,000 population in 1992.

Shortages of health care professionals involved in care for people with diabetes were recognized. In particular, there were inadequate numbers of primary care physicians, endocrinologists, nephrologists, certified diabetes educators, podiatrists, and pharmacists trained in the care of people with diabetes. Major physician health professional shortages were identified by the Office of Primary Care, S.C. DHEC in 50% of the 48 countries in South Carolina and 74% of the counties in the state were designated by the S.C. State Health and Human Services Commission as medically underserved.

Crude estimates of quality of care for people with diabetes were made. In one survey of type 2 diabetes patients in 1994, 24% had not seen a medical doctor in the past year for diabetes, only 34% reported that they checked blood glucose at least once a day, and a mere 28% had ever heard of HbA1c. Of these, only 18% had an A1C check in the past year. Approximately one quarter of the diabetes individuals reported eye examinations and less than half said they had a foot examination in the past year. It was found that diabetes education had been provided to less than 50% of diabetic individuals.

Evidence was appearing from large scale collaborative clinical trials that the risks of morbidity and mortality from such cardiovascular complications as myocardial infarction and stroke could be substantially reduced by intensive management of lipid profiles and elevated blood pressure. In 1993, the seminal report from the Diabetes Control and Complications Trial (DCCT) established that intensive glycemic regulation in type 1 diabetes would substantially decrease the risks for the progression of retinopathy, nephropathy, and neuropathy. Simple, inexpensive low dose aspirin therapy produced modest risk reductions for myocardial infarction as a secondary prevention strategy. Microalbuminuria was recognized as a risk marker for cardiovascular events and for renal failure, and it was predicted that intervention trials with angiotensin converting enzyme inhibitors (ACEI) would be effective in delaying progression of these serious complications.

Thus, a serious public health problem of diabetes and its complications was recognized in South Carolina and in the United States. An undersupply of qualified health professionals was on hand to deal with the increasing demands of more intensive education and health care for people with diabetes. Ominous upward trends in mortality and morbidity statistics were present, and an increasing incidence of
markers of future cardiovascular events (hypertension, cholesterol, over weight/obesity) was occurring. It was evident that an action plan was needed.

**ESTABLISHING THE DIABETES INITIATIVE OF SOUTH CAROLINA**

A political action committee of the South Carolina Affiliate, American Diabetes Association, was instrumental in establishing a dialogue with the Medical university of South Carolina (M.U.S.C.), the University of South Carolina, School of Medicine (U.S.C.), and the S.C. Department of Health and Environmental Control (S.C. DHEC). The first step in establishing the Diabetes Initiative of South Carolina (DSC) was recommended by Dr. James Edwards, President of M.U.S.C. and past Governor of the State of South Carolina. A simple proviso was inserted in July, 1992, in the South Carolina Appropriation Act, FY 1992-1993. It stated:

*(Diabetes Mellitus Study)* Of the higher education formula funds allocated to the Medical University of South Carolina, the Medical University of South Carolina is to conduct a study of the scope and impact of diabetes mellitus in South Carolina, and make recommendations for the establishment of a statewide program of education, clinical research, and translation of new diabetes treatment methods which will serve the needs of people with diabetes mellitus. The study will be coordinated with representatives of the Joint Legislative Health Care Planning and Oversight Committee, the Office of the Governor, the University of South Carolina Medical School, the South Carolina Department of Health and Environmental Control, the American Diabetes Association (South Carolina Affiliate), the American Association of Diabetes Educators, and the South Carolina Medical Association. The Medical University of South Carolina shall report its findings to the General Assembly no later than January 15, 1993.

A Steering Committee with statewide representation, as defined in the Proviso, was created under the chairmanship of John A. Colwell, MD, PhD, with E. Theodore Bransome, M.D. as vice-chairman. The Steering Committee met monthly for 6 months, and received reports from local committees and work groups at M.U.S.C., U.S.C., S.C. DHEC, and the S.C. Affiliate of the American Association a comprehensive report, “The Diabetes Initiative of South Carolina” was submitted to the Legislature on January 1, 1993.

The Legislature and its pertinent committees received the report, analyzed it, and in June, 1994, passed “The Diabetes Initiative of South Carolina Act.” The Act created a Diabetes Initiative of South Carolina Board, a Diabetes Center of Excellence at M.U.S.C. and a Diabetes Outreach Council. The Board was to establish a statewide program of education, surveillance, clinical research, and translation of new diabetes treatment methods to serve the needs of S.C. residents with diabetes mellitus”. Members would be appointed by key organizations with interest/involvement in diabetes mellitus. Oversight functions were described, and submission of an Annual Report to the Governor and the General Assembly was required. The Legislation stated that a Center of Excellence at M.U.S.C. “shall develop and implement programs of professional education, specialized care, and clinical research in diabetes and its complications, in accordance with priorities set by the Board.” It further stated that the Outreach Council “shall oversee and direct efforts in patient education and primary care”. In 1995, the Board established Bylaws, and established a Surveillance Council to develop and implement a system for the assessment of diabetes in S.C. and to provide a mechanism to evaluate intervention and control programs. This council would work closely with the Diabetes Control Program, S.C. DHEC, the S.C. Bureau of Statistics, the Professional Review Organization (Carolina Medical Review) for Medicare/Medicaid, with other third party payors, and with other data sources such as the Hypertension Initiative of South Carolina, and the Southeastern Kidney Register. The structure of the Diabetes Initiative of S.C. is shown in fig. 1. Since 1995, the Board has met quarterly, as have each of the 3 major Councils. In addition, the Board has appointed task forces and committees to address numerous specific issues of individuals, all with an interest in diabetes, have consistently volunteered to actively participate.
STATE AND EXTRAMURAL GRANT SUPPORT

Support for the Diabetes Initiative of South Carolina is allocated on a yearly basis, after review of the Annual Report and requested finding by the appropriate committees of the State Legislature. Yearly support has average approximately $350,000. This supports the primary administrative offices, which are based in the Diabetes Center of the Endocrinology-Diabetes-Medical Genetics Division, Department of Medicine, M.U.S.C., Charleston, South Carolina. A second administrative site was established in the Department of Family and Preventative Medicine at the University of South Carolina, School of Medicine in Columbia, South Carolina. These two offices provide administrative support for the Board, Councils, and committees, and handle budgetary and programmatic issues, as they develop.

A critical strategy in the establishment of the Diabetes Initiative of South Carolina was a commitment to at least match the state support each year with extramural grants directed at the goals and objectives of the Diabetes Initiative. Our policy has been to encourage faculty at both medical schools as well as community-based individuals to compete for such support, and to highlight the unique structure of the Diabetes Initiative as strength to help insure the feasibility of accomplishing the aims of the grants. This has been a successful policy; extramural grant support has more than matched state funding each year since 1994, and has averaged approximately $3 million yearly (7.6 times average yearly state support). The ratio for 2002 was 20 times state support (over $7 million yearly).

Some specific details about major grants are included elsewhere in this report.

MISSION STATEMENT

A mission statement was adopted in May 1996. It states that the Diabetes Initiative of South Carolina will maintain a leadership position in providing education about diabetes and its complications to the general public, individuals with diabetes, and health professionals. The Initiative will develop and sustain education programs in medicine, nursing, pharmacy and other health professions and will promote the highest standards of medical care in diabetes and its complications. It will develop methods to assure the certification (recognition) of optimal numbers of individuals and programs as providers of superior knowledge about diabetes and its complications. The Initiative will organize and supervise programs which provide ongoing epidemiologic information and surveillance of medical costs, scope and impact of diabetes, and its complications in South Carolina. The Initiative will develop community-based diabetes programs to promote lifestyle changes that have the potential to prevent or delay the onset of diabetes and its complications. The Initiative will work closely with other organized groups that are active in programs directed at diabetes and its complications. Finally, the Diabetes Initiative of South Carolina will conduct research on selected clinical issues in diabetes, as defined and approved by peer reviewed research protocols.
THE 10 YEAR STRATEGIC PLAN

In 1997, after careful study, the Board approved the Ten Year Strategic Plan (1998-2008). An outline of the plan’s major goals and objectives as well as the major areas of involvement of the 3 Councils is shown in Fig. 2.

There are 9 major goals in the 10 Year Strategic Plan. For each of these goals, issues are defined, specific aims are stated, and the responsibilities of the 3 major Councils are described. The major goals of the Plan are:

Goal I: To improve knowledge of diabetes, quality of life, and access to prevention and intervention services for people at risk and those affected by diabetes.

Goal II: To increase the utilization of short-term (surrogate) measures that lead to actions that will delay progression of complications of diabetes.

Goal III: To address the needs of persons at risk and those with diabetes by increasing services and education in health professional shortage areas in South Carolina.

Goal IV: To reduce the morbidity and disability rates from diabetes-related complications.

Goal V: To reduce the age-adjusted mortality rates from diabetes and its complications.

Goal VI: To decrease risks for select groups of people with diabetes where the prevalence and complication rates exceed those of others.

Goal VII: To reduce preventable hospital admissions and charges for diabetes.

Goal VIII: To reduce preventable visits to the emergency room by people with diabetes.

Goal IX: To improve the statistical basis for estimating the prevalence of diabetes and diabetes-related complications in South Carolina.

In 2003, the Board and the Councils evaluated the first 5 years of progress towards the first 3 major goals of the 10 Year Strategic Plan. Critical data were provided by the Burden of Diabetes in South Carolina Reports, issued jointly by The Diabetes Control Program, S.C. DHEC and the Surveillance Council and Board of the Diabetes Initiative of South Carolina, in 1996, 1999 and 2002. We have determined that major progress has been made towards the aims of the first 3 Goals.

**Goal 1: Progress**

The first goal is to improve knowledge of diabetes, quality of life, and access to prevention and intervention services for people at risk and those affected by diabetes. The Outreach Council has particularly been involved in this area.

**Legislation**, two important bills have been passed:

(A) S.C. General Assembly Bill H3928 “on or after 1/1/2000, every HMO, individual and group health insurance policy or contract shall provide coverage for the equipment, supplies, and outpatient self-management training and education for the treatment of people with diabetes, if medically necessary, and prescribes by a health care professional legally authorized to prescribe such items who demonstrates adherence to minimal standards of care for diabetes mellitus as adopted and published by the Diabetes Initiative of South Carolina.
(B) Services and payment for diabetes education programs shall conform to regulations of Health Care Financing Administration, US Department of Health and Human Service, pursuant to Section 4105 of the Balanced Budget Act of 1997. Diabetes outpatient self-care professional with certification in diabetes by the National Certification Board of Diabetes Educators, or other accredited program approved by the Diabetes Initiative of South Carolina or by the Diabetes Control Program of the SC Department of Health and Environmental Control in order to meet the needs of rural communities wherein certified health care professionals providing this service are not available.

(C) Nothing contained in this section may be construed to affect in any way the ability of managed care plan to credential or re-credential a provider.

Amended 5/24/2000

Coverage must not be denied unless the health care professional demonstrates a persistent pattern of failure to adhere to the minimal standards of care and unless the health maintenance organization or insurer has first provided written notice to the health care professional that coverage will be denied if the health care professional fails to adhere to the minimal standards of care.

DSC – Minimal Standards of Care

Pursuant to Act No. 98 of 1999 (H-3928), the Diabetes Initiative of South Carolina has adopted minimal standards of care for the treatment of diabetes mellitus in South Carolina effective January 1, 2000. This act required health insurers/HMO’s subject to the act to provide for coverage for diabetes equipment, supplies, and outpatient self-management education if medically necessary and prescribed by an authorized health care professional who demonstrates adherence to these minimal standards of care.

7 minimal standards were adopted on 12/3/99 by the Diabetes Initiative of SC Board. The minimal standards were adopted from review of AMAP, ADA, NCQA, HEDIS, and DQIP guidelines:
1. At least one HbA1c test annually.
2. Annual lipid profile test.
3. Annual assessment of nephropathy.
4. Blood pressure assessment at each diabetes office visit.
5. Annual foot examination.
6. Referral of annual dilated eye exam.

Partnerships

The structure of the Diabetes Initiative of South Carolina (Fig.1) includes Board and Council representation and collaborative arrangements with the Diabetes Control Program, S.C. DHEC, and with the Southeastern group of the American Diabetes Associate (ADA). A site is developed in the Department of Family and Preventive Medicine at the University of South Carolina, School of Medicine (USC). This allows for realistic involvement of Diabetes Initiative volunteers in programs of these major organizations and extends the Initiative administrative functions to the two medical schools in South Carolina.

The S.C. DHEC Bureau of Chronic Disease Prevention and Health Promotion and the Division of Diabetes Prevention and Control work collaboratively to develop, implement, and evaluate programs that support healthier lifestyles including healthy eating, physical activity, weight control and smoking cessation. These programs reach all counties in South Carolina through local health departments. The S.C. DHEC Bureau provides technical assistance, guidance, and consultation to the 13 Health Districts that cover the 46 counties in South Carolina.
There are 3 ADA signature programs in which the Diabetes Initiative is closely involved:

- Diabetes Sunday
- Diabetes Alert
- African American Program

For Diabetes Sunday, at least 47 different churches in South Carolina have conducted diabetes Sundays at their church reaching an estimated 5,000 persons participating in diabetes-related activities.

For Diabetes Alert Day, many local hospital diabetes programs, community groups, and health professionals provide information and screening for diabetes.

The ADA African American Program was the basis for the Annual African American Diabetes Day. This educational meeting is held annually, and attracts 500-600 African Americans who are affected by diabetes.

**Major Extramural Grants**

The Palmetto Community Health Network has received yearly support from the Duke Foundation since 1999 to improve diabetes care and outcomes for a 9-county, 7-hospital network. The initial grant was developed by network leaders in collaboration with Carolina Medical Review and the Diabetes Initiative of S.C. The focus is on improving diabetes education for all; to this end diabetes education programs have now been implemented in 5 counties.

REACH 2010 has established diabetes education classes in 4 community health center sites and currently one of the programs is an ADA Recognized Education Program (Enterprise Neighborhood Health Program). In addition to education, two of the sites are using the Diabetes Electronic Management System to assist the sites in improving care through ongoing monitoring of care. REACH 2010 is described in more detail in sections to follow.

Dietary Education for Rural, Black Persons with Diabetes, has a focus on dietary self-management to combat type 2 diabetes in Winnsboro, SC.

Diabetes Education Center of Lancaster, this grant specially focuses on patient-centered education that allows people with diabetes to take an active role in the self-management of diabetes, learn preventive measures to decrease complication of diabetes, and improve quality of life.

**Healthy S.C. Initiative**

Lighten Up! is a faith-based program dedicated to supporting healthier lifestyles of participants. Over 4 years, 621 persons (18% diabetic) have completed the program. Significant weight reduction, drop in B.p., and fall in triglyceride and cholesterol levels have been seen at 10 weeks and maintained for 1 year in 186 individuals.

The Enterprise program is a community-based risk reduction program for an underserved population, primarily African-American, 29% of whom have diabetes and hypertension. Significant reductions in B.p., cholesterol, and A1C have been seen at 1 year.

Partners in Wellness is a program for students at the 6 Historically Black Colleges and Universities (HBCU) to promote health awareness among African-American students in diabetes, hypertension, obesity, and cardiovascular disease. Students from 6 HBCUs have completed a 1-semester course and have developed and implemented projects related to diabetes in their communities. The program is being expanded to a 2-semester course at S.C. State University, and is an integral part of a newly funded major grant, Project EXPORT.
Programs to Decrease Cost Barriers

Fairfield Diabetes Group
In 2000, the Fairfield Diabetes Initiative Group was established as a non-profit foundation to develop, manage and support a Diabetic Education Center in Fairfield County for the provision of screening, education, and community diabetes awareness programs. The Fairfield Diabetes Education was established in 2000 through a Duke Endowment grant in partnership with Health Partners (non-profit health assoc.). Results include (1) a free community diabetes education classes provided by a CDE once a month. The mean A1C pre-test is 8.4 –post-test is 7.5 for 2002. (2) Annual diabetes screening held since 2001. (3) Certification as a diabetes provider by ADA in 2001.

State Health Plan Enrollees
Diabetes Initiative personnel have conducted half day patient education programs four times yearly for State Health Plan enrollees with diabetes for the past 8 years. The Budget and Control Board’s Office of Research and Statistics did an analysis of health costs of 196 State Health Plan employees who attended a diabetes management workshop between 1995 and 1999. A matched group, according to gender, age, diabetic complications, and co-morbidities (hypertension, high cholesterol, heart disease, etc) served as the control group, and did not attend any of the workshops. Participants in the workshops decreased their medical claims costs by $455,549 ($2,324 per enrollee) over a two year period. The average drug costs increased by $200 per patient for a total of $39,200. Net Savings: $416,349!

Volunteers in Medicine Hilton Head Clinic
Volunteer health care providers have developed a free diabetic clinic for underserved individuals and their families in the Hilton Head, S.C. region. A weekly multidisciplinary diabetic clinic staffed by volunteer physicians, nurses, diabetes educators, dieticians, social workers, and interpreters was established in January 2002. Patients received all medications and supplies free of charge. Review of case and outcome indicators has shown improvement in glycemic control as well as management of blood pressure and lipids. (See Goal II).

Discussion (Goal I)
In recognition of the increasing prevalence, morbidity, mortality, and costs of diabetes and its complications in South Carolina, the Legislature created an innovative program, the Diabetes Initiative of South Carolina, in January 1994. A governing, widely representative Board meets quarterly, reviews programs of outreach, professional education, and monitors trends as reported by a Surveillance Council. Close liaisons are created with the Diabetes Control Program of the Department of Health and Environmental Control, with Carolina Medical Review, with the American Diabetes Association, and with other organizations and programs dealing with people with diabetes in South Carolina. The program is administered with modest support from the state at the Diabetes Center of M.U.S.C., and by a second site at the University of S.C., School of Medicine. A 10 Year Strategic Plan is under review after 5 years.

Substantial progress has been made in addressing the first major goal of this 10 Year Plan. Two programs of the Healthy South Carolina Initiative of M.U.S.C. have successfully instituted lifestyle interventions that are reducing risks for diabetes complications. A major education program at the 6 HBCU's introduces undergraduate students to the seriousness of diabetes, hypertension, and obesity and provides methods and rationale to address these issues for students interested in health professional careers. The structure of the Diabetes Initiative allows for frequent interchange and form the development of health promotion programs through the auspices of the Diabetes Control Program, S.C. DHEC, the American Diabetes Association, and Carolina Medical Review. Legislation mandating coverage for equipment, supplies, and outpatient self-management training for diabetes has been passed, and minimal standards of care have been established by the Diabetes Initiative of South Carolina. Programs to
decrease cost barriers for underserved people with diabetes are operative and are accomplishing impressive results.

Although there is still much to do, it is apparent that the Diabetes Initiative of South Carolina has made major progress in addressing issues defined in the first goal of the 10 Year Strategic Plan.

**Goal II: Progress**

The second goal is: *to increase the utilization of short-term (surrogate) measures that lead to actions that will delay progression of complications of diabetes.*

**Public Awareness**

A number of programs to increase public awareness of these surrogate measures are underway. As already noted, the Diabetes Initiative of South Carolina established 7 minimal standards, in response to legislation. To encourage patient awareness and utilization, a gold card was developed by REACH 2010 and approved by the Board of the Diabetes Initiative (Fig. 3). Approximately 7,000 of these cards have been distributed primarily in the African American communities of Charleston and Georgetown counties. An evaluation plan of the card’s effectiveness is currently underway in REACH 2010.

There are may organized community-based program, around the state which address this goal. These include:

- Fairfield Diabetes Initiative Group
- Lancaster Diabetes Program
- Diabetes programs in Barnwell, Bamberg, Allendale counties
- PRO-Hampton Diabetes Connection
- Loris Health Care System

**Diabetes Education Programs**

**Model Diabetes Education Program**

In 1996, Pamela Arnold, MSN, APRN, BC-ADM, CDE, in collaboration with the Diabetes Control Program, S.C. DHEC, developed a comprehensive manual to enable hospitals and clinics to develop patient education programs that would meet ADA standards. Ms. Arnold worked directly with interested sites as a consultant. The results of this program are that 25 programs have been recognized by DSC since 1997. They are:

- Anderson Area Medical Center, Anderson
- DHEC Home Health District – Trident
- DHEC Home Health District – Appalachia I
- DHEC Home Health District – Appalachia II
- DHEC Home Health District – Appalachia III
- DHEC Home Health District – Palmetto
- DHEC Home Health District – Wateree
- DHEC Home Health District – Waccamaw
- DHEC Home Health District – Upper Savanna
- DHEC Home Health District – Edisto
- DHEC Home Health District – PeeDee
- DHEC Home Health District – Low Country
- DHEC Home Health District - Catawba
- St. Francis Home Health, Charleston
ADA Certificate of Recognition for Patient Education

In 2000, the ADA’s certifying system for patient education was adopted by Medicare as a criterion for reimbursement. In the next two years, 27 individual and one multicenter site (MUSC) received recognition by the ADA for their diabetes education programs. Eighty percent of these sites had started or completed the DSC/DCP Model Diabetes Education Program, and could thereby proceed easily to ADA certification. By 2003, there were 51 ADA approved sites, a substantial increase from 3 in 1996. These approved programs are scattered throughout the state of South Carolina (see Fig. 4) and clearly directly address the two major goals cited above.

Utilization of Surrogate Measures

Carolina Medical Review

DSC has collaborated with Carolina Medical Review in improving the utilization of short-term (surrogate) measures that should delay the progression of diabetes and its complications. Data are regularly provided by DSC Board Member and Director of Carolina Medical Review, Nelson Gunter, M.D. Changes in key quality indicators selected for the Medicare beneficiaries as determined by Medicare Part B claims, have now been analyzed, comparing 1998-1999 to 2000-2001. These data are published in JAMA 2003; 289:305-312. County-specific rates are publicized as information and to provide incentive.

Results for South Carolina

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<th>Averages</th>
<th>Change from Baseline</th>
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<tr>
<td>Yearly HbA1C</td>
<td>77%</td>
<td>10%</td>
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<tr>
<td>Eye exam (≤ 2 yr)</td>
<td>68%</td>
<td>3%</td>
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<tr>
<td>Lipid profile (≤ 2 yr)</td>
<td>72%</td>
<td>16%</td>
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<tr>
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<th>Median (U.S.)</th>
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<tr>
<td>Yearly HbA1C</td>
<td>78%</td>
<td>8%</td>
</tr>
<tr>
<td>Eye exam (≤ 2 yr)</td>
<td>70%</td>
<td>1%</td>
</tr>
<tr>
<td>Lipid profile (≤ 2 yr)</td>
<td>74%</td>
<td>16%</td>
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These data indicate that South Carolina compares favorably with median U.S. results for these three quality indicators in the states Medicare diabetic population.

Hypertension Initiative of S.C.

DSC Board member Brent Egan, M.D. directs the Hypertension Initiative of S.C. This group has developed an innovative program which identifies certified specialists in hypertension in S.C. and regularly collects data on key quality indicators in patients with hypertension. At present, there are approximately 100 primary care physicians who provide regular feedback on control of diabetes (HbA1C), blood pressure, and lipids. There are about 2700 people with diabetes and hypertension in the program, 1100 of whom are
African Americans. Recent data: 47% of these have HbA1C <7%, 36% have LDL-C <100 mg/dl and 24% have BP <130/85mmHg. 88% of these diabetic patients are on ACE inhibitor therapy. This exciting program is clearly making an impact on the health of people with diabetes and hypertension in South Carolina.

Diabetes Collaborative (DCP-SC DHEC)
In 2001, Ellen Babb of the DSC-DHEC worked with three Community Health Centers to improve diabetes care. Within these 3 centers there are 15 individual sites. Significant quality improvement was seen at each site. Many set up the Diabetes Electronic Monitoring System (DEMS) to follow indicators. A comparison of care indicators from a 1999 chart audit to the 2001 DEMS data revealed

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<th>Indicator</th>
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<th>2000-2001</th>
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<tbody>
<tr>
<td>Foot Exams</td>
<td>35.7%</td>
<td>71.1%</td>
</tr>
<tr>
<td>Eye Exams</td>
<td>13.2%</td>
<td>41.9%</td>
</tr>
<tr>
<td>HbA1C (&gt;2/yr)</td>
<td>45.6%</td>
<td>65.7%</td>
</tr>
<tr>
<td>Flu vaccine</td>
<td>19.4%</td>
<td>51.8%</td>
</tr>
<tr>
<td>Pneumovax</td>
<td>16.4%</td>
<td>56.1%</td>
</tr>
<tr>
<td>N</td>
<td>61-68</td>
<td>262</td>
</tr>
</tbody>
</table>

Racial and Ethnic Approaches to Community Health (REACH 2010)
The principal investigator of this large community-oriented grant is DSC Board member Carolyn Jenkins, Dr.PH, APRN, BC-ADM, RD, FAAN, CDE. There are many activities of this large program which address the issue of diabetes among approximately 13,000 African Americans in Charleston and Georgetown Counties, S.C. In this program, Dr. Jenkins and her staff are longitudinally assessing quality indicators by chart or computerized record review in 5 different sites in these two counties over a 7 year period. Data from the first two years indicate improvement in the key indicators:

<table>
<thead>
<tr>
<th>REACH: 1998 vs. 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determination</td>
</tr>
<tr>
<td>% Annual Lipids</td>
</tr>
<tr>
<td>% Annual B.P.</td>
</tr>
</tbody>
</table>

These data show improvement in the utilization of three key parameters of diabetes care. Disparities between African Americans and Caucasians present in 1998 are no longer present, or are diminishing.

Greenville Hospital System
The Greenville Hospital System has a Diabetes Self-Management Program, directed by Drs. John Bruch and William Webster. This program became a DSC Affiliated Partner in 2002. Results from 2001 were as follows:

The year 2001 was a very successful and productive year for the patients and staff of the Diabetes Self-Management Program. Overall, there were 650 patients in the program: 426 Basic, 107 in Intensive, and 97 in Gestational. On the 426 patients enrolled in the Basic Program, statistical significant improvements (p <0.05) in three months were seen in these areas:

- Weight was reduced by an average of 4.4 pounds
- Exercise increased from an average of 474 Kcals/wk to 1214 Kcals/wk (e.g. walking ~ 4.5 miles/wk to 12 miles/wk)
- LDL cholesterol decreased from 107 to 99 mg/dl
Triglycerides decreased from 281 to 214 mg/dl
HbA1C decreased from 8.5 to 6.8%
Diastolic blood pressure decreased 5.2 mm Hg

Additional improvements were:

- 97% of patients had a foot exam within one year
- 95% of patients had an eye exam within one year
- Gestational Diabetes Program: 89% of the babies born to the 97 enrolled mothers weighed < 9lbs

Hilton Head Free Diabetes Clinic
Volunteers in medicine have organized a free weekly diabetes clinic at Hilton Head, S.C. It is staffed by volunteer physicians, nurses, diabetes educators, dieticians, and social workers. In 2002, 130 diabetes patients (51% African American, 31% Hispanic) were treated by disease management protocols and followed for up to 1 year.

<table>
<thead>
<tr>
<th>Results</th>
<th>Baseline</th>
<th>Recent</th>
<th>% at Goal</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C</td>
<td>9.3%</td>
<td>8.2%</td>
<td>28%</td>
<td>&lt;7%</td>
</tr>
<tr>
<td>B.P.</td>
<td>142/84</td>
<td>137/80</td>
<td>35%</td>
<td>&lt;130/80 mmHg</td>
</tr>
<tr>
<td>Chol.</td>
<td>202</td>
<td>185</td>
<td>73%</td>
<td>&lt;200 mg/dl</td>
</tr>
<tr>
<td>LDL-C</td>
<td>123</td>
<td>108</td>
<td>44%</td>
<td>&lt;100 mg/dl</td>
</tr>
<tr>
<td>HDL-C</td>
<td>48</td>
<td>48</td>
<td>48%</td>
<td>&gt;45 mg/dl</td>
</tr>
<tr>
<td>Trig.</td>
<td>175</td>
<td>153</td>
<td>65%</td>
<td>&lt;150 mg/dl</td>
</tr>
</tbody>
</table>

These early results indicate that a free Diabetes Clinic staffed by volunteer health care providers and serving mostly uninsured and minority patients can successfully improve glycemic, B.p. and lipid control.

Burden of Diabetes in S.C. Report
Serial questionnaires have indicated an increase in the utilization of self-monitoring of blood glucose and at least yearly determinations HbA1C. For instance, in 1994, only 28% of a group of people with diabetes had ever heard of HbA1C, and only 18% of these had it checked in the past year (= 5% checked). In 2000, 84-92% of people surveyed reported that HbA1C was checked at least once yearly and 66-74% twice yearly or more. There has also been increase in the percentage of people with diabetes who report a yearly dilated eye examination (from 27% in 1994 to 68% in 2001), and in those who report a yearly foot examination (from 43% in 1994 to 71% in 2001). There has been an increase in the percentage of people with diabetes who have taken a course for the management of diabetes to approximately 50% in 2001, from previous under estimates of 29-33% in 1994.

Discussion Goal II
There has been very good progress towards increasing utilization of surrogate measures which should lead to actions to delay progression of the complications of diabetes. First, there has been a major increase in the number of programs of public awareness. Second, primarily due to a concerted effort to develop model diabetes education programs around the state, and the subsequent adoption of these to qualify for certification by the ADA, we now have 51 ADA approved sites in South Carolina. This is a remarkable increase from 3 sites in 1996. Next, there is evidence from a variety of sources that utilization of key surrogates, in checking yearly HbA1C, eyes or foot examinations, lipids, vaccinations for influenza or pneumonia, and formal patient education have significantly increased. Preliminary information from several programs indicate that intensive management programs are achieving stringent goals of therapy regarding HbA1C, blood pressure control, lipid regulation, and utilization of Ace inhibitors and aspirin therapy.
Predictably, if these promising trends continue, we should see a gradual drop in the incidence of serious eye disease, amputations, myocardial infarctions, and endstage renal disease. It is recognized, however, that many years of intensive management will be necessary before significant improvement in morbidity and mortality can be expected. Future reports will deal with these issues by analyzing progress in attaining Goals IV-VIII in the Strategic Plan.

There are trends which indicate that we face a major challenge in implanting a successful statewide program which will have a real impact on morbidity/mortality from diabetes and its complications. Prevalence of know diabetes has increased from 5.6% in 1998 to 8.1% in 2001. The percentages of individuals with diabetes who report they are overweight have increased from 51% to 60% between 1998. Prevalence of known hypertension has increased in Caucasians, remains high in African Americans, and is at least twice that in nondiabetic individuals. Prevalence of myocardial infarction is 15.5% in people with diabetes, approximately 4x those in nondiabetics, and stroke prevalence is 8.1%, or almost 5x that in nondiabetic people. Consistent, broadly based long term intensive multifactorial prevention programs will be necessary to counteract these challenging figures.

**Goal III: Progress**

The third goal is: **to address the needs of persons at risk and those with diabetes by increasing services and education in health professional shortage areas in South Carolina**

**Health Care Personnel**

There has been an impressive increase in the numbers of physicians in South Carolina who may care for people with diabetes between 1995 and 2002 (table 1). Numbers of new physicians have increased 2 to 3 fold in the majority of key disciplines. There has also been a general increase in non-physician personnel who care for people with diabetes. This is particularly apparent in the case of Certified Diabetes Educators and Pharmacists trained specially to care for diabetic individuals. These two results may be attributed, at least in part, to programs started by the Diabetes Initiative of South Carolina.

**Professional Education Programs**

**Annual Symposium**

The Diabetes Initiative has sponsored 9 yearly Diabetes Symposia for Primary Health Care Professionals. Co-sponsors include the M.U.S.C. Diabetes Center, the USC/DSC Site at the University of South Carolina, Carolina Medical Review and the S.C. Diabetes Prevention and Control Program, S.C. DHEC. Continuing education credits are given for physicians, nurses, dieticians, pharmacists, and social workers who attend the program. Outstanding local and outside experts from a variety of disciplines comprise the faculty. Interactive workshops provide exposure to and discussion of practical topics for attendees. A very popular poster session is held, and this attracts 30-35 posters yearly. Total attendance reached 300 in 2003. Overall, approximately 1800 individuals have attended these symposia, with a preponderance of nurses and physicians with special interests in diabetes mellitus.

**CDE Review Course**

We hold two review courses yearly which are directed at individuals interested in becoming Certified Diabetes Educators (CDEs). These 2 day courses rotate around the state, and local faculty are aided in presentations by our library of Power Point slides. From 75 to 150 people have attended, and we have seen our number of CDEs in the state rise from 25 in 1994 to 251 in 2002. These individuals are usually R.N.s, but also include physicians, pharmacists, and dieticians, and social workers. One of our goals in this program is to train enough CDEs so that rural, as well as urban cities and counties are covered. As shown
in Fig. 4, we have made great progress towards this goal. ADA-approved diabetes education programs and CDE’s are present in counties with a high prevalence of diabetes (Figs. 4 & 5).

**Diabetes Education for Pharmacists**

In the fall of 1996, and again in the fall of 1997, the Diabetes Initiative of S.C. and the schools of Pharmacy at M.U.S. and U.S.C. developed a comprehensive program on diabetes mellitus for training pharmacists. Deborah Carson, PharmD, was Director. A curriculum was developed, a comprehensive syllabus was provided and weekend review and workshop sessions on diabetes and its complications were held. Faculty consisted of M.U.S.C. and U.S.C. physicians, nurses, and pharmacists. Close to 100 pharmacists, mostly from community pharmacies and identified diabetic patients who would agree to be counseled, with approval of local physicians. This course concluded each year with a second weekend review and workshop session, which included assessment of patient-pharmacist interactions and a final test. This innovative program has contributed to 10 pharmacists achieving CDE recognition. Diabetes education courses in community pharmacies have been established. In December 1999, Debbie Carson reported to the Board on the results from the program. Data from 110 patients followed by 48 pharmacists showed that in the first 3-9 months of the program, 61% of patients had a lowering of HbA1C (8.2% to 6.8%), 7.9% had an average decrease in fasting blood glucose of 44 mg/dl, and 73% had a loss of weight (mean 8 lbs lost). Long term follow-up is underway.

**Office-Based Diabetes Management for Primary Health Care Providers**

In calendar year 1996 and early 1997, Ellen Babb, R.D., CDE of the Diabetes Control Program, S.C. DHEC conducted office visits into primary care offices scattered throughout the state. She utilized education material which focused on guidelines for care, developed by DSC and DCP, according to ADA guidelines. Between 11/95 and 3/97, she visited 148 different practice groups and introduced them to these new guidelines for care. A total of 285 primary care physicians and 25 other health professional (nurse practitioners, physician assistants) attended these sessions, which were usually held over the noon hours. Feedback on this program was uniformly positive.

**Office-Based Diabetes Management for Primary Health Care Providers (1998)**

The first edition of this comprehensive and practical publication was written in 1998. Nine primary contributors included physicians, nurse educators, pharmacists, and dieticians. Members of the DSC Board and other professionals served as reviewers with industry support. The Manual was mailed or given to approximately 2000 primary care health professionals in South Carolina. Continuing Medical Education certification by testing was included. The Manual was also distributed directly to medical house staff at U.S.C., M.U.S.C., and in the A.H.E.C. training programs for primary care physicians in Family Medicine. The program was very well received, and decision was made to revise and update it in 2002.

A writing group of 18 health professionals from M.U.S.C., U.S.C., and DCP, S.C. DHEC revised and updated the Manual. The new edition has 146 pages, and is a comprehensive, valuable, practical review of clinically important aspects of management for people with diabetes. A faculty of 20 diabetes specialists were chosen to introduce the Manual at symposia around the state. The program started in May, 2002, and by December 31, 2002, 21 sessions had been held, with the distribution of 1600 Manuals to attendees. A Power Point presentation and/or slide set were developed, with accompanying text. The Manual is available on our DSC website (www.musc.edu/diabetes). This program has been very well received by physicians, and other health professionals, and was continued for a full year, until spring 2003.

**Third Year Medical Student Program**

In 1998, a rural clerkship for third year medical students at M.U.S.C. and U.S.C. was started under the direction of David Garr, M.D., Alec Chessman, M.D., and Donna Kern, M.D. By 1999, all third year students at both schools were assigned to a rural primary care practitioner for a 1 month experience. From its inception, this program focused on diabetes as its primary disease, and DSC has supplied copies of the
Primary Care Manual to each student as curricular material. The students also do a community-based project during the rotation, and usually pick diabetes as the subject. These projects are presented to faculty and DSC representative, Pamela Arnold, MSN, APRN, BC-ADM, CDE at the end of each rotation. We believe that this program affords a unique opportunity for students to appreciate and understand the impact of diabetes in the community.

Examples of Health Improvement projects initiated by 3rd year medical students in various rural communities over an 18 month period are shown in table 2.

Nursing Foot Care Course
This one-day program is designed to offer nurses a “hands-on” opportunity to assess patients and provide basic and intermediate foot care. Participants will learn foot care skills that reduce complications associated with arthritis, structural deformities, diabetes, and vascular disease.

DSC Collaboration with Major Extramurally Support Grants
There are 6 large grants; all supported by the Diabetes Initiative of South Carolina which address issues of education and care for people at risk for or with known diabetes. These are primarily in rural, underserved areas; many are focused on African-Americans with diabetes. These programs are as follows:

1. The Charleston and Georgetown Diabetes Coalition – Racial and Ethnic Approaches to Community Health (REACH) 2010, is funded by the Centers for Disease Control and Prevention (CDE), is working with Charleston and Georgetown counties to reduce disparities of diabetes awareness, health care access, diabetes education, and complications of diabetes complications in African Americans. It has been extended to a 7-year grant (9/29/1999-9/29/2007), with $1,032,434 in fiscal year 9/29/2002-9/29/2003. PI: Dr. Carolyn Jenkins at M.U.S.C.

2. EXCEED, is a program project aiming at understanding and eliminating health disparities in blacks in South Carolina, funded by the Agency of Healthcare research and Quality (AHRQ), the U.S. Department of Health and Human Services. It is designed to reduce racial disparity in cardiovascular disease through improved blood pressure control, to implement healthcare delivery models in African Americans with Diabetes, and to provide concordant care to African Americans with diabetes and depression. Under the grant, a multi-disciplinary team analyzes contributing factors for inequalities related to the delivery and practice of health care, and identified and implements strategies to improve the process. Total funding (10/1/2000-8/31/2005) will be $10.1 million, with $2,074,064 for fiscal year 9/1/2002-8/31/2003. PI: Dr. Barbara Tilley at M.U.S.C.

3. Dietary Education for Rural, Black Persons with Diabetes, funded by the NIH’s National Institute for Nursing Research with $144,500 between 6/1/2001 and 5/31/2003, is to focus on dietary self-management to combat type 2 diabetes in Winnsboro, S.C. PI: Dr. Wanda Anderson-Loftin, at U.S.C. College of Nursing


5. Diabetes Education Center of Lancaster, funded by J Marion Sims Foundation $1,051,000 from 1/1/2001 to 12/31/2003. This grant specially focuses on patient-centered education that allows
people with diabetes to take an active role in the self-management of diabetes, learn preventive measures to decrease complications of diabetes, & improve quality of life. Yearly funding between 1/1/2002 and 12/31/2002 is $239,050. PI: Dr. F. Michael Kimbrell at Catawba-Wateree AHEC.

6. **EXPORT Center on Metabolic Syndrome and Minority Health** is funded by NIH's National Center on Minority Health and Health Disparities. This five-year grant of $3.7 million from 9/30/2002 to 9/29/2007 aims to promote research to reduce health disparities with supports for a partnership between M.U.S.C. and South Carolina State University. EXPORT focuses on diabetes, hypertension, obesity, and lipid abnormalities which are major contributors to health disparities. Funding for fiscal year 9/30/2002-9/29/2003 is $484,240. PI: Dr. Sabra Slaughter at M.U.S.C. and Dr. James Walker, Jr., at South Carolina State University.

**Total** (Education and Care): $4,146,248.

There are also eight clinical research grants which are addressing a variety of issues in people with diabetes in South Carolina. They are as follows:

1. **Markers and Mechanisms of Macrovascular Disease in Diabetes** is funded by the NIH's National Heart, Lung and Blood Institute from 9/1/2001 to 8/31/2006 with estimated total funding of $7,330,930. Funding is $1,385,266 for fiscal year 9/1/2002-8/31/2003. The research focuses on the roles of lipoproteins, oxidation, auto-immunity, insulin resistance, and genetics in development of vascular disease in type 1 and type 2 diabetes. PI: Dr. Maria Lopes-Virella at M.U.S.C.

2. **Collaborative Management of Diabetes in Blacks**, is funded by Agency for Health Care Policy and Research (AHCPR) for 7/1/2001 to 6/30/2006, focuses on diabetes management and improving health outcomes in a minority population. Funding for fiscal year 7/1/2002-6/30/2003 is $126,630. PI: Dr. Leonard Egede at M.U.S.C.

3. **Improving Diabetes Outcomes in Poor Blacks: A Socio Cultural Approach** is funded by the American Diabetes Association (ADA) for three years from 1/1/2001 to 12/31/2004. The project is directed at improving diabetes care for blacks. The first year 1/1/2002-12/31/2003 funding is $100,000. PI: Dr. Leonard Egede at M.U.S.C.


5. **Uniform Population – Based Approach and Research on Childhood Diabetes** is funded by the Centers for Disease Control and Prevention (CDC). This is a five-year (9/30/2000-9/29/2005) project totaling $2.3 million. The first year's funding was $204,816. The second year funding of $730,991 is between 9/30/2001-9/29/2003. The third year funding is $648,233 between 9/30/2002-9/29/2003. The grant is part of a multi-site national study in collaboration with research scientists at some of the nation's most prestigious institutions to conduct research on type 2 diabetes in youth. PI: Dr. Elizabeth Mayer-Davis at U.S.C.

7. **South Carolina COBRE for Oral Health** is funded by the NIH at $8.7 million for 5-years, from 9/30/2002-9/29/2008. This grant is to develop a multidisciplinary and interactive particularly among African Americans. Diabetes and Oral Health Project is funded for $104,666 for fiscal year between 9/30/2002-9/29/2003. PI: Dr. Steven London. M.U.S.C.

8. **Epidemiology of Diabetes Intervention and Complications (EDIC)** is a follow-up study (1994-2005) of the course of patients enrolled in the Diabetes Control and Complications Trial (DCCT) in Charleston. Along with patients from 27 other centers in United States and Canada, this is a study of vascular complications after long-term glycemic control in type 1 diabetes. Fiscal year 3/1/2002-2/28/2003 funding is $157,784. PI: Dr. John A. Colwell and Dr. Ronald K. Mayfield at M.U.S.C.

    **Total** (Clinical Research): $2,846,261.
    **Grand Total** (All Grants): $6,992,509.

**Discussion Goal III**

We have made substantial progress in addressing the third major goal. The numbers of trained health care personnel have increased remarkably between 1995 and 2002. There has been at least a doubling of trained physicians in 6 of 8 critical specialties and a 75% increase in two. In the non-physician category. The numbers of certified diabetes educators and physicians assistants have tripled, and we now have 94 specially trained pharmacists in diabetes, where some existed previously. In view of the increasing complexity of multifactorial management of people with diabetes, the team concept of management is increasing. To complement the increased numbers of health care personnel, successful professional education programs are ongoing. A key resource has been 2 separate publications of Office-Based Diabetes Management for Primary Care Providers and its distribution to over 3600 practitioners. The Diabetes Initiative of S.C. has collaborated with the Department of Family Medicine in highlighting diabetes in its innovative third year medical student rural primary care experience. Finally, major extramural support has now been guaranteed for a variety of community-oriented programs and clinical research projects which will increase knowledge and support improved medical care for people with diabetes in South Carolina.
CONCLUSIONS

1. A unique statewide collaborative effort has been created by the Legislature to address the needs of people affected by diabetes in South Carolina: The Diabetes Initiative of South Carolina.

2. Board and Council governance and memberships assure wide, consistent communication between key organizations and individuals concerned with addressing issues posed by diabetes in this state.

3. Close collaboration exist in the Diabetes Initiative of South Carolina between the Diabetes Control and Prevention Program, South Carolina Department of Health and Environmental Control, Carolina Medical Review, the Hypertension Initiative of South Carolina, the American Diabetes Associate (Southeastern Group), the Bureau of Health and Statistics, the two medical schools in South Carolina (M.U.S.C. and U.S.C.), and a variety of other organizations.

4. A Mission Statement and a Ten Year Strategic Plan provide goals and objectives for the overall programs.

5. Community outreach, professional and patient education programs, and ongoing surveillance are successfully established and are operative.

6. Promising trends in indicators of specialty of care and in members of trained health care personnel are developing and will predictably begin to impact favorably on outcomes in the future.

7. Offsetting those trends has been an increase in prevalence of diabetes, percentages of the diabetic population who are overweight, and an increase in the proposition of people with diabetes who have hypertension.

8. Analysis of the first 3 major goals in the 10 Year Strategic Plan at the 5th year of the Plan reveals excellent progress. In the future, analyses will focus on the other 7 goals, which are longer term in nature.

9. Major extramural grant funding for community-based programs and clinical research has been acquired.

10. We are please with the progress in this unique combination of public and private resources as well as Federal, State, and local support in the battle against diabetes mellitus, a major public health problem.
<table>
<thead>
<tr>
<th>Medical Field</th>
<th>1995</th>
<th>2002</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Practice</td>
<td>747</td>
<td>1,509</td>
<td>102%</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>394</td>
<td>945</td>
<td>140%</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>231</td>
<td>694</td>
<td>200%</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>11</td>
<td>47</td>
<td>327%</td>
</tr>
<tr>
<td>Cardiology</td>
<td>119</td>
<td>331</td>
<td>178%</td>
</tr>
<tr>
<td>Nephrology</td>
<td>43</td>
<td>76</td>
<td>77%</td>
</tr>
<tr>
<td>Neurology</td>
<td>54</td>
<td>157</td>
<td>283%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>177</td>
<td>310</td>
<td>75%</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>24,587</td>
<td>30,722</td>
<td>25%</td>
</tr>
<tr>
<td>Licensed Practical Nurses</td>
<td>8,572</td>
<td>9,415</td>
<td>10%</td>
</tr>
<tr>
<td>Registered Dieticians</td>
<td>751</td>
<td>699</td>
<td>-7%</td>
</tr>
<tr>
<td>Certified Diabetes Educators</td>
<td>85</td>
<td>251</td>
<td>195%</td>
</tr>
<tr>
<td>Pharmacists: Diabetic Education</td>
<td>0</td>
<td>94</td>
<td>&gt;-&lt;</td>
</tr>
<tr>
<td>Physicians' Assistants</td>
<td>77</td>
<td>287</td>
<td>272%</td>
</tr>
<tr>
<td>Podiatrists</td>
<td>97</td>
<td>143</td>
<td>47%</td>
</tr>
</tbody>
</table>
Table 2

HEALTH IMPROVEMENT PROJECTS

Initiated by 3rd Year Medical Students in Rural Communities July 1999-December 2000

<table>
<thead>
<tr>
<th>Project</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice/Community Needs Assessments</td>
<td>48</td>
</tr>
<tr>
<td>Diabetes Support Groups</td>
<td>45</td>
</tr>
<tr>
<td>Diabetes Education Seminars</td>
<td>32</td>
</tr>
<tr>
<td>Exercise/Walking Clubs</td>
<td>27</td>
</tr>
<tr>
<td>Nutrition Education/Cooking Classes</td>
<td>19</td>
</tr>
<tr>
<td>Diabetes Health Screenings</td>
<td>18</td>
</tr>
<tr>
<td>Smoking Cessation Projects</td>
<td>9</td>
</tr>
<tr>
<td>Patient Information Centers</td>
<td>6</td>
</tr>
<tr>
<td>Community Resource Guides for Diabetics</td>
<td>5</td>
</tr>
<tr>
<td>Chart audits for ADA guideline compliance (over 500 charts reviewed)</td>
<td>5</td>
</tr>
</tbody>
</table>
Figure 1

ORGANIZATIONAL CHART
Structure of the Diabetes Initiative of South Carolina

DSC BOARD

Center of Excellence Council
- MUSC Center of Excellence
  - USC Site

Outreach Council
- ADA-SC Outreach Program

Surveillance Council
- S.C. DHEC Diabetes Control Program
Figure 2

Outline of the Goals of the Ten Year Strategic Plan

DIABETES INITIATIVE OF SC

- IMPROVE KNOWLEDGE OF DM, QUALITY OF LIFE AND ACCESS TO PREVENTION, INTERVENTION

OUTREACH COUNCIL PROGRAMS

DIABETES CENTER PROGRAMS

- ↑ UTILIZATION OF SURROGATE MEASURES AND ACTIONS

SURVEILLANCE COUNCIL ANALYSES

↓ HOSPITAL ADMISSIONS

↓ MORBIDITY

↓ ER VISITS

↓ MORTALITY

↓ COSTS

IMPROVE QUALITY OF LIFE
Figure 3

Diabetes Scorecard for People with Diabetes

EACH YEAR!

GET

- Hemoglobin A1c every 3-6 months
- Dilated Eye Examination
- Urine test for Microalbumin
- Test for Lipids/Cholesterol
- Foot Examination every visit
- Dental Examination
- Flu Shot

TALK TO YOUR DOCTOR, NURSE OR PHARMACIST ABOUT:

How to treat high blood sugar
How you treat low blood sugar
Tobacco/Alcohol use
Your exercise program
Your feelings about diabetes

CONTROL DIABETES!

Protect

EYES
HEART
KIDNEYS
FEET
See your doctor every three months
Ask your doctor at every visit

- Blood glucose level ______ goal ______
- Hemoglobin A1c test ______ goal ______
- Blood pressure ______ goal ______
- Foot exam ______ goal ______
- Weight ______ goal ______
- Diet ______ goal ______

**Self Management**

- Check blood sugar ______ times daily
- Follow diet ______ calories
- Exercise ______ minutes/day
- Medications ______ times/day

<table>
<thead>
<tr>
<th></th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Each Visit</strong></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td></td>
</tr>
<tr>
<td>Glucose</td>
<td></td>
</tr>
<tr>
<td><strong>Quarterly</strong></td>
<td></td>
</tr>
<tr>
<td>Hemoglobin A1c</td>
<td></td>
</tr>
<tr>
<td>Foot Exam</td>
<td></td>
</tr>
<tr>
<td><strong>Yearly</strong></td>
<td></td>
</tr>
<tr>
<td>Dilated Eye Exam</td>
<td></td>
</tr>
<tr>
<td>Fastin Lipid Profile (quarterly if abnormal)</td>
<td></td>
</tr>
<tr>
<td>Microalbuminaria Screening</td>
<td></td>
</tr>
<tr>
<td>Flu Vaccine</td>
<td></td>
</tr>
<tr>
<td>Pneumovax (once)</td>
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<tr>
<td><strong>Medication &amp; Review</strong></td>
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Figure 4

Distribution by County of Certified Diabetes Educators (CDE's) & ADA-Approved Diabetes Education Programs in South Carolina, 2003

Legend: CDEs on top, ADA Programs on bottom
Figure 5
Prevalence of Diabetes by County in South Carolina, 2003
Diabetes Initiative of South Carolina
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