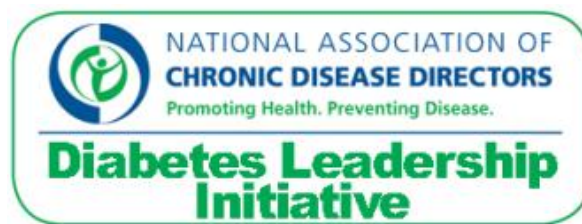


The High Cost of Diabetes and Diabetes Complications

*A White Paper from the National Association of Chronic Disease Directors
Diabetes Leadership Initiative*

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Diabetes prevalence in adults is increasing.¹ Obesity, a contributing cause of diabetes, is a national epidemic.² A conservative estimate of the effect of rising obesity rates suggests that obesity could contribute to more than six million cases of type 2 diabetes in the next twenty years.³ The increasing prevalence of diabetes “is a major contributor to increased health care costs overall, and to Medicare costs in particular.”⁴

Cost of Diabetes to Individuals, Payers and Society

The total economic burden of diabetes in the U.S. was estimated at \$218 billion in 2007 when costs related to prediabetes were included.⁵ Medical expenses for people with diabetes are over two times higher than those for people without diabetes.⁶

Men and women with diabetes were more likely to have work limitations compared with those without diabetes.⁷ Impairments, limitations or disabilities most commonly result from the development and progression of the chronic complications of diabetes.⁸ A 2006 study published in the *Journal of Visual Impairment & Blindness, Special Supplement* retrospectively examined limitations among people with diabetes and vision impairment.⁹ Of people with diabetes and vision impairment age 65 years and older who experience moderate-to-severe limitations, 53% reported difficulty walking and 44% reported difficulty climbing stairs compared to 16% and 18% respectively in people without diabetes in the same age group (1997-2004 data).⁹ Vision loss is associated with a higher prevalence of chronic health

Diabetes and Diabetes Complications Are Costly



- The total U.S. economic burden of diabetes and prediabetes was estimated at \$218 billion (2007).⁵
- Costs related to conditions caused by obesity include almost \$17 billion for diabetes.¹²
- Diabetes, high blood pressure, or a combination of the two accounted for 9.4% of health care costs in the U.S. (2003-2005 data).¹³
- Thirty-three percent of the \$116 billion in direct costs of treatment of diabetes and its complications in the U.S. in 2007 were associated with the treatment of foot ulcers.¹⁴
- Diabetes-related blindness is a personal and societal burden, costing the U.S. about \$500 million annually.¹⁶
- Annual Medicare expenditures for patients with CKD reached \$19,752 per person per year in 2008; costs were lower for patients at CKD stages 1-2 compared to patients at CKD stages 3-5.¹⁶

conditions as well as falls and injuries.¹⁰

The \$218 billion estimate of the total cost of diabetes in the U.S. cited earlier includes \$65 billion in lower productivity.⁵ Diabetes can lead to costly and debilitating¹¹ health complications including neuropathy (nervous system disease), retinopathy (blindness and eye problems), heart disease, stroke and kidney disease.⁶ Diabetes is associated with a reduced quality of life especially for those with multiple and/or severe complications.¹⁷

Cost of Diabetes Complications

An analysis of 2009 UnitedHealthcare data showed that the average annual costs for a health plan member with diabetes complications were almost three times the average costs for plan members without diabetes.¹⁸ Per-patient costs for insured patients with diabetes during the year in which a complication/event occurs are high and remain higher in the subsequent two years compared with the costs in the year before the event. Complication/event refers to heart disease, heart attack, heart failure, stroke, blindness, amputation or kidney failure.¹⁹

Researchers looking at health-related quality of life for managed care health plan members with diabetes complications calculated utility scores for specific health-related outcomes (2000-2001 data).²⁰ Utility scores, when combined with survival times are used to calculate quality-adjusted life-years, a health outcome measure.²⁰ Diabetes-related complications in the study group members were associated with lower utility scores which indicates a health state less desirable than optimal health.²⁰ Diabetes complications varied in their effect on health-related quality of life by as much as 10-fold; the lowest utility scores were associated with dialysis, neuropathy, and stroke.²⁰

“The diabetes population and the related costs are expected to at least double in the next 25 years. Without significant changes in public or private strategies, this population and cost growth are expected to add a significant strain to an overburdened health care system.”²³

Neuropathy and Lower Extremity Amputation

Thirty-three percent of the approximately \$116 billion in 2007 direct costs of treatment of diabetes and its complications in the United States were associated with the treatment of foot ulcers.¹⁴ Foot ulcers cause emotional, physical, productivity, and financial losses with one researcher describing the “most costly and feared consequence of a foot ulcer” as limb amputation.²¹ Hospital costs for adults with diabetes-related lower extremity amputations were more than \$1.6 billion in 2006.²²

Retinopathy, Low Vision and Blindness

Diabetic retinopathy is a common complication of diabetes that damages the retina of the eye¹⁰ and can lead to severe vision loss.⁶ Diabetes-related blindness is a personal and societal burden, costing the U.S. about \$500 million annually.¹⁵ Total annual excess medical care expenditures were calculated at \$633 for individuals with low vision and \$2,803 for those who are blind (2003-2009 data).²⁴ When these total annual excess medical care expenditures for blindness and low vision were applied to national prevalence figures for these conditions, the total excess medical care expenditure including intangibles was estimated at \$8.1 billion for blindness with \$4.3 billion of this amount attributed to reduced quality of life.²⁴ Vision loss also compromises quality of life and is associated with depression and social isolation.¹⁰

Cardiovascular Disease

Diabetes, high blood pressure or a combination of these two diseases accounted for 9.4% of health care costs in the U.S. (2003-2005).¹³ Heart diseases were the top reason for hospitalization for people with diabetes from 2001-2008, representing more than 20% of all diabetic hospitalizations.²⁵ Expenditure calculations using 2004-2008 data from the California Public Employees' Retirement System health program, which covers over a million employees and their family members, showed that those with diabetes and hypertension had \$3,920 in excess annual per-person expenditures compared to people with neither of these conditions.²⁶ Hypertension may also be associated with lower health-related quality of life, particularly related to physical function.²⁷

Nephropathy and Diabetic Kidney Disease

Late-stage diabetic nephropathy is the single largest contributor to the additional costs of medical care for patients with type 2 diabetes.²⁸ Annual Medicare expenditures for patients with chronic kidney disease (CKD) reached \$19,752 per person per year in 2008 but costs were lower for patients at CKD stages 1-2 compared to patients at CKD stages 3-5.¹⁶ People covered by the California Public Employees' Retirement System health program who had diabetes, hypertension, and heart, cerebrovascular, or renal disease had \$24,215 in excess annual per-person expenditures compared to people with none of these conditions.²⁶ Progression of nephropathy was strongly associated with higher subsequent medical care costs in patients with hypertension and diabetes.²⁸ Health-related quality of life related to co-morbidities is significantly impaired in patients with diabetes and CKD.²⁹

Potential for Reducing Costs

Progress has been made in reducing the burden of diabetes complications such as vision loss and amputations, but “diabetes care remains suboptimal, risk factors for complications are too prevalent, rates of complications and death are too high, and disadvantaged populations continue to be disproportionately affected.”¹⁵

Researchers examining the potential savings from investing in disease prevention found that reducing

diabetes and high blood pressure rates by 5 percent could save the U.S. more than \$5 billion in health care costs and that reducing heart disease, kidney disease, and stroke prevalence by 5 percent could increase these savings to over \$19 billion.¹³ A study on the cost implications of improving glucose management for adults with type 2 diabetes concluded that the cost of improving glucose management seems modest relative to health care expenditures related to diabetes.³⁰ Slowing disease progression should be as important a health care priority as treating acute episodes of an illness.³¹

Additional considerations related to the potential for reducing the cost of diabetes complications:

- Patients who visited a podiatrist had \$13,474 lower costs in commercial plans and \$3,624 lower costs in Medicare plans during 2-year follow-up in a 2011 analysis.¹⁴
- Using a cost-effectiveness model developed for the National Commission on Prevention Priorities, researchers estimated that vision screening of adults, an evidenced-based clinical preventive service, saves \$22 per person per year (2006 dollars).³²
- In addition to the potential economic savings, cardiovascular disease prevention will be valuable in developing a healthier, more productive society.³³
- Researchers estimated that slowing the progression of chronic renal failure by 20% would save approximately \$39 billion over 10 years, based on data from the U.S. Renal Data System.²⁸
- Increased prevention efforts may reduce the significant economic burden of diabetic nephropathy since research shows that as nephropathy progressed there was an associated increase in medical costs in hypertensive patients with diabetes.²⁸

Reducing Diabetes Costs



- A modeling estimate shows that a 50% improvement in diabetes management and control could reduce annual medical costs for patients with diabetes by \$196 billion (in 2031 dollars) over a twenty-year period.³⁴
- A cost simulation on nationwide implementation of a community-based diabetes prevention program estimated \$29.8 billion in downstream savings for people who might have developed diabetes and its complications without the program.³⁵
- Diabetes patient registries for prioritization of high-risk patients and physician meetings to discuss patient care were associated with lower costs of care for patients with diabetes.³⁶
- For each 10 percent increase in local public health spending, there was a decrease in deaths from diabetes of 1.4%.¹²

These compelling facts about the high cost of diabetes and its complications highlight the importance of the Diabetes Leadership Initiative opportunity to address the costly yet under-recognized complications of diabetes.



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