INTEGRATED BENEFITS INSTITUTE

UNMANAGED DIABETES IN THE WORKPLACE

HIGHER WORKER ABSENCE, LOWER PERFORMANCE

Summary

- Diabetes, particularly if unmanaged and undertreated, is associated with work disruption in the form of higher absence, lower job performance, and extended periods of disability.
- Acute symptoms of poorly managed diabetes that may disrupt work include fatigue, irritability, and mobility-limiting infections.
- More severe events include stroke, limb amputations and other occurrences with long-term implications, including the potential for permanent work disability.
- Normal blood glucose levels are associated with fewer absences and higher performance.
- Value-based plan designs that support reliable treatment and monitoring methods for better glycemic control may diminish these negative work outcomes.

Background

The American Diabetes Association estimates that 30 million children and adults in the U.S. have diabetes in addition to 86 million pre-diabetics who are at risk for developing type 2 diabetes.[1] Individuals with diabetes, whether type 1 or type 2, have difficulty with glycemic control because their ability to produce insulin is impaired, rendering them unable to convert sugar (blood glucose) into the fuel their body needs. Type 1 diabetics must depend on insulin therapy as they are unable to produce insulin. Type 2 diabetics are insulin resistant, causing blood glucose to reach abnormal levels in the body.

Hypoglycemia occurs when individuals have low plasma glucose levels and can produce a range of outcomes from light-headedness and confusion, to coma and death. Hypoglycemic events, whether severe (requiring third party assistance) or non-severe, can affect sleep quality, subsequent daily function and effective management of diabetes.[2]

The medical costs associated with complicated diabetes cases such as hypoglycemic episodes, infections and other events are highly variable. For managing hypoglycemic episodes in particular, the variation ranged from $176 to $16,478, with the cost depending on the type of treatment required.[3] One study found that events associated

with emergency hospitalizations could be traced to reduced food intake and administration of the wrong insulin product.[4] Older individuals and those of lower socio-economic status have a higher incidence of severe hypoglycemic events.[5,6] Additional socio-emotional costs, including anxiety and fear of having hypoglycemic events, can also greatly affect individual quality of life and mental and physical health.[7,8]

In addition to increasing the risk of permanently-disabling or life-threatening conditions such as glaucoma, stroke, or heart disease, people with diabetes often suffer from acute symptoms such as fatigue, irritability, and infections (particularly on the feet, which can limit mobility for short durations, and later necessitate amputation). This can lead to missed work time due to illness as well as degraded performance while on the job.

Diabetic Workers and Work Impact

A prior IBI study profiled employees with diabetes using data on health risks, biometrics and self-reported absence and job performance via a health-risk assessment (HRA).[9] The 2009 dataset contains 99,558 responses across 55 employers with an average of 1,810 employee responses per employer. The HRA provided the primary source of information on self-reported chronic conditions, socio-demographics and work-related outcome variables. In addition, the HRA dataset included biometric information that allowed IBI to compare self-reported diabetes to lab values that indicate probable diabetes.

People with diabetes often have several other serious medical conditions as well. The likelihood of diabetes generally increases with body mass and is highest for employees with the following self-reported chronic health conditions: hypertension, heart disease, high cholesterol, GERD, sleeping disorders and anxiety.

IBI corroborated existing research and found that people with diabetes are more likely to miss work because of illness. Overall, about 13% of all employees missed at least one day of work over the 28 days preceding the survey. For diabetic[1] employees, the percentage was 18%. On average, the odds of missing at least one day of work in the preceding month were 47% higher for workers with diabetes than for workers with normal fasting blood glucose. By contrast, the odds for a worker with pre-diabetes were only 16% higher than the odds for a worker with normal blood glucose. The finding that diabetic employees miss more work than employees with pre-diabetes warrants further research into whether moderate improvements in blood glucose can result in better productivity outcomes for employees.

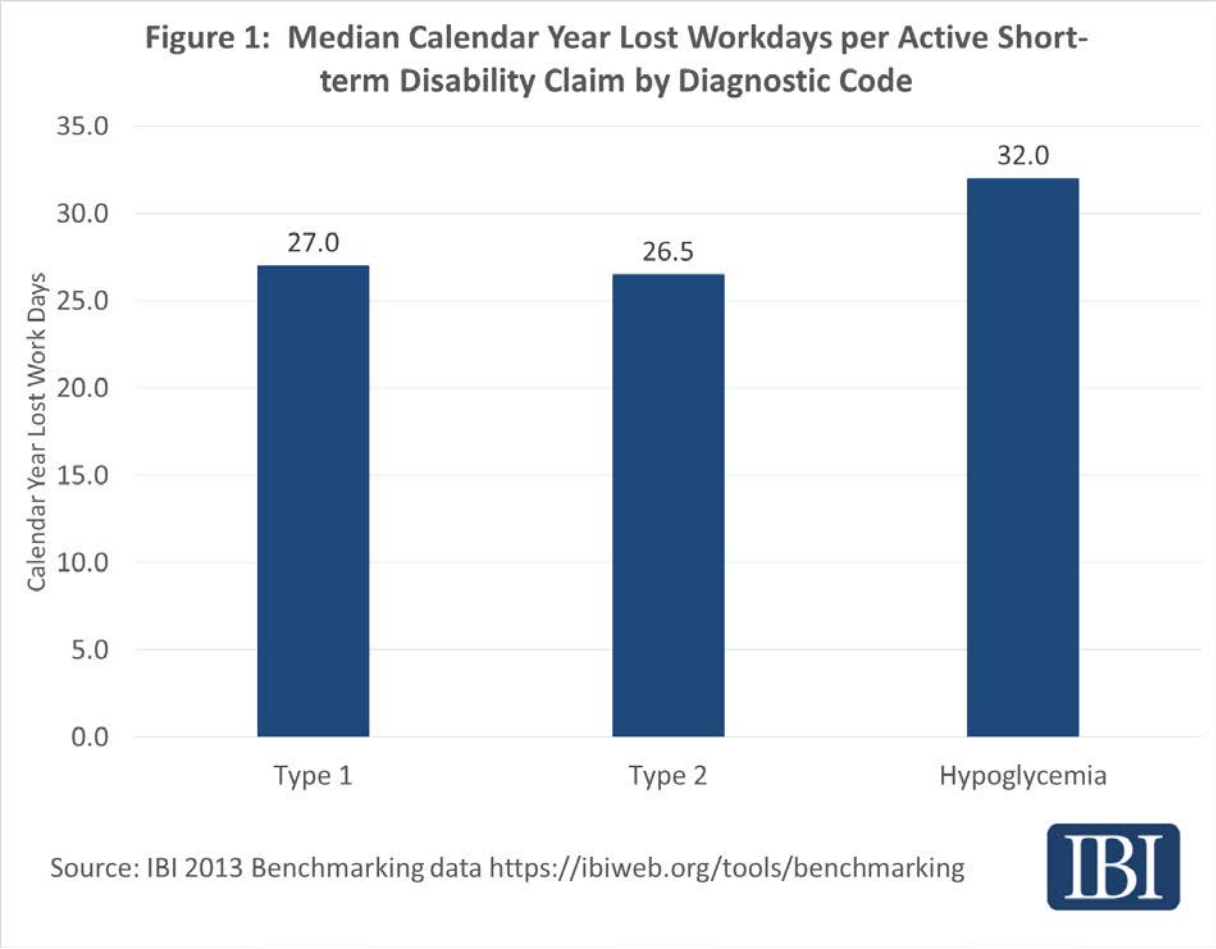
Diabetic employees also report slightly lower job performance than employees with normal blood glucose levels, even after adjusting for other health conditions.

[1] Normal blood glucose is indicated by fasting blood glucose between 70-100 mg/dl. Diabetes is indicated where fasting blood glucose is above 126 mg/dl. Prediabetics fall between the normal and diabetic ranges, and are at an elevated risk of developing diabetes.

Performance for employees with pre-diabetes is not discernibly different than that for employees with normal blood glucose – again underscoring the potential for positive outcomes through achieving moderate blood glucose improvements.

Work Disability Days

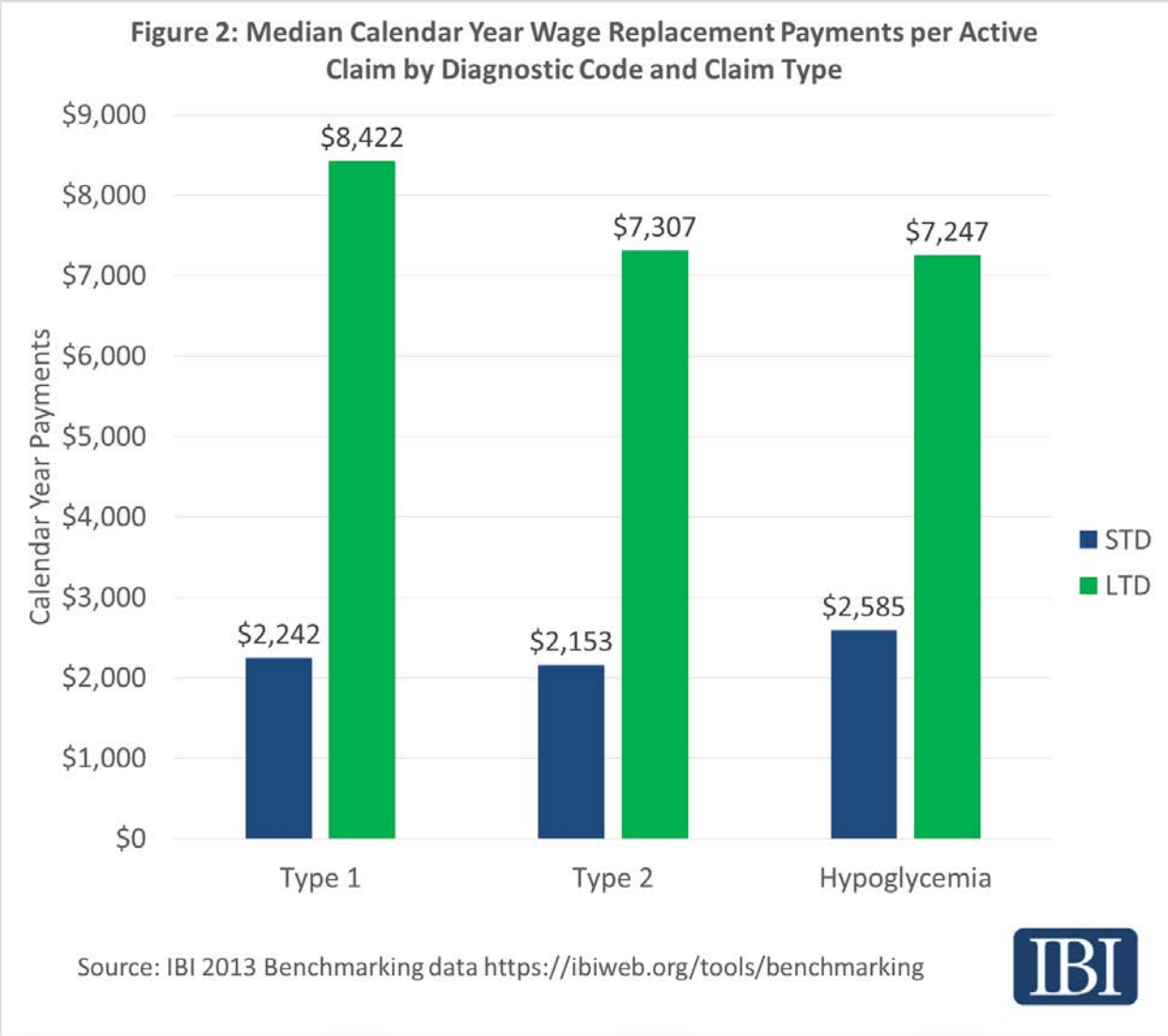
Individuals with diabetes and/or hypoglycemia experience episodes of prolonged absence from work and additional costs from periods of short-term and long-term work disability. For this report, we selected claims from IBI's 2013 Benchmarking data for short and long-term disability with diagnostic codes for three separate groups: 1) hypoglycemia, 2) type 1 diabetes and 3) type 2 diabetes (see Data and Analysis at end of report for more detail). As Figure 1 shows, diabetes and hypoglycemia can result in costly episodes of lost productivity when employees end up on short-term diability leave (STD).



The average lost workdays is not significantly different between these three groups and ranges between 42 and 43 lost workdays per active claim in a calendar year. However, hypoglycemic episodes have a longer median duration than either type 1 or type 2 diabetes claims with a one-week difference at the median (32 days vs. 27 days).

Wage Replacement Payments

As shown in Figure 2 median wage replacement payments in a calendar year for periods of lost work time due to short-term disability range between $2,153 and $2,585 per active claim for each of the three groups. Once a case becomes a long-term disability (LTD), the costs triple as compared to short-term disability cases (STD). The median LTD costs are higher for type 1 diabetics compared to type 2 or hypoglycemic cases. Because claims distributions tend to be skewed the average costs are higher than the median costs with mean STD costs ranging between $4,007 and $4,863 in one calendar year for each of the three groups. Average LTD costs are approximately triple the average STD costs in one calendar year. Employers can mitigate these costs through preventive efforts to lessen claim incidence and by closing gaps in care to shorten disability episodes, preventing STD episodes from transitioning to LTD and implementing effective return-to-work and case management programs.



Employee Awareness and Employer Support

Severe hypoglycemic events are uncommon in the workplace setting.[10] While severe events often result in trips to the emergency room and possible hospitalization, non-severe events can nevertheless disrupt daily functioning, including sleep, work attendance and job performance.[11]

The first thing employers can do is improve employees' access to blood glucose testing – paying special attention to those groups identified as having a high likelihood of elevated blood glucose levels. Since knowledge of diabetes requires diagnosis by a medical provider based on lab results, relying on self-reports of diabetes to determine prevalence in a workforce will most likely only identify individuals who have already been diagnosed. Individuals with pre-diabetes will most likely not be identified through a self-report survey unless biometric information is also obtained.

Access to testing is especially important given that our study found that 55% of the 2,118 employees with glucose levels above 125 mg responded "no" when asked directly if they had diabetes. While this potential lack of diabetes awareness is troubling, the positive news is that almost all (95%) of the employees who were aware of their diabetes reported that they were currently receiving diabetes treatment from a medical professional.

It is likely that broader contact with the healthcare system – including treatment for other chronic illnesses – improves awareness of diabetes. Our results show that among employees with blood glucose levels in the diabetes range, the more conditions for which a person was being treated (other than diabetes itself), the more likely they were to self-report having diabetes. Specifically, given the baseline level of diabetes awareness (45%), we estimate that about 75% of diabetic employees treated for obesity were aware of their diabetes. Diabetes awareness was also relatively high among employees currently treated for high cholesterol, high blood pressure, and depression. Diabetes awareness was particularly low (22%) among employees currently being treated for migraines and other severe headaches.

Employers should compare results of self-reported data or screening efforts with actual utilization data from medical and pharmacy claims to identify potential gaps in care. Benefits plans should also be reviewed to ensure that coverage supports high-quality treatment rather than incentivizing delays in treatment or skipping medication. Value-based plan designs that minimize employee cost-sharing for effective treatment may improve treatment compliance.[12]

To support employees in their awareness and management of diabetes, employers can make it easier to be screened for diabetes and support access to treatment. Older workers and those with lower income and educational attainment tend to be more susceptible to under-treatment. Employers can benefit from ensuring that their health plans and wellness outreach efforts focus diabetes information and management

resources on high-risk groups. There is also evidence that adjusting total work hours may help individuals with diabetes to better manage their condition.[13]

Resources

The CDC offers practical guidance to individuals with diabetes and to employers, health plans, and others with an interest in supporting the continued health of employees with diabetes

http://www.cdc.gov/workplacehealthpromotion/implementation/topics/type2-diabetes.html

The National Diabetes Education Program has a range of materials specifically developed for diabetes in the workplace

https://diabetesatwork.org/

The American Diabetes Association has summarized different treatment options

www.diabetes.org/living-with-diabetes/treatment-and-care/

Specific guidance for employers on diabetes in the workplace in relation to ADA is available at the EEOC

http://www.eeoc.gov/laws/types/diabetes.cfm

Data and Analysis

All work presented here, with the exception of the most recent IBI benchmarking results, has been presented elsewhere per the citations. Data sources and methods used to generate results can be found in referenced publications. The exceptions are the short- and long-term disability results presented in this paper. Those data were pulled from the 2013 IBI Benchmarking data specifically for this report. The current annual database is built on 52,000+ employers with 4.4+ million claims representing 891 SIC industry groups. The thirteen major data providers include: Aetna, Anthem Life/Wellpoint, Aon Hewitt, Broadspire, Cigna, Liberty Mutual, MetLife, Prudential, RSLI/Matrix, Sedgwick CMS, The Hartford, The Standard & Unum.

For this report, short-term and long-term disability claims experience was selected based on ICD-9 codes for the following three groups as outlined in the table below: 1) claims with hypoglycemia, 2) claims with type 2 diabetes and 3) claims with type 1 diabetes.

Claims with hypoglycemia	**Claims with diabetes only**
identified based on the presence of the following ICD-9 codes 251.0 (hypoglycemic coma), 251.1 (other specified hypoglycemia), 251.2 (hypoglycemia, unspecified), 270.3 (leucine-induced hypoglycemia), 250.8	identified based on the presence of the following ICD-9 codes **Type 2 diabetes:** 250.x0 or 250.x2 Exclude 250.8 **Type I diabetes:** 250.x1 or 250.x3

[1] http://www.diabetes.org/in-my-community/american-diabetes-month.html
[2] Brod, M., Christensen, Torsten and Bushnell, D.M. Impact of nocturnal hypoglycemic events on diabetes management, sleep quality, and next-day function: results form a four-country survey. Journal of Medical Economics. 2012. 15(1). pp. 1-10.
[3] Ward, A., Alvarez, P., Vo, L. and Martin, S. Direct medical costs of complications of diabetes in the United States: estimates for event-year and annual state costs (USD 2012). Journal of Medical Economics. 2014. 17(3). Pp. 176-183.
[4] Geller, A., Shehab, N., Lovegrove, M., Kegler, S., Weidenbach, K., Ryan, G. and Budnitz, D. National Estimates of Insulin-Related Hypoglycemia and Errors Leading to Emergency Department Visits and Hospitalizations. JAMA Internal Medicine. Published online March 20, 2014.
[5] Ginde, A., Espinola, J. and Camargo, C. Trends and Disparities in U.S. Emergency Department Visits for Hypoglycemia, 1993-2005. Diabetes Care. 31(3). March 2008.
[6] Harris SB, Leiter LA, Yale JF, et al. Out of pocket costs of managing hypoglycemia and hypoglycemia in patients with type 1 diabetes and insulin-treated type 2 diabetes. Can J Diabetes 2007;31:25–33;
[7] Shi, L., Shao, H., Zhao, Y. and Thomas, N. Is hypoglycemia fear independently associated with health-related quality of life? Health and Quality of Life Outcomes. BioMedCentral. 2014. http://www.hqlo.com/content/12/1/167
[8] Davis RE, Morrissey M, Peters JR, et al. Impact of hypoglycemia on quality of life and productivity in type 1 and type 2 diabetes. Curr Med Res Opin 2005;21:1477–83.
[9] IBI Study, Diabetes - how employers can defuse a looming time bomb in their workforce, November 2011.
[10] Leckie AM, Graham MK, Grant JB, et al. Frequency, severity, and morbidity of hypoglycemia occurring in the workplace in people with insulin-treated diabetes. Diabetes Care 2005;28:1333–8.
[11] Brod, M., et al. The impact of non-severe hypoglycemic events on work productivity and diabetes management. 2011 Jul-Aug;14(5):665-71.
[12] Gibson, T., Mahoney, J., Lucas, K., Heithoff, K., and Gatwood, J. Value-based design and prescription drug utilization patterns among diabetes patients. Am J Pharm Benefits. 2013;5(3):113-120.
[13] Davila, E.P., et al. "Long work hours is associated with suboptimal glycemic control among US workers with diabetes." American journal of industrial medicine 2011: 54.5: 375-383.