Using Electronic Health Records and Clinical Decision Support to Provide Guidance on Occupational Factors which Impact Diabetes: A Final Knowledge Resource Report

Revised and resubmitted December 4, 2015
The Diabetes subject matter expert (SME) group

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Produced under CDC/NIOSH contract 212-2014-M-59011.

Clinics (AOEC), or the American College of Occupational and Environmental Medicine (ACOEM).

General Approach

The recommendations are consistent with recommendations of the American Diabetes Association (ADAssn) and the quality measures used are from the National Quality Forum (NQF). Clinical Decision Support (CDS) was recommended only for patients where the HbA1c ≥ 8 or reported episodes of hypoglycemia. While several reviewers noted that an HbA1c ≥ 8 is not the ideal, based on discussions with primary care providers (PCP) it was determined that this would enable PCP to direct their efforts to patients most in need of education. This level can be altered based on a clinic's specific needs and population.

We could not find a guideline that specifically addresses management of diabetes during shift work. In response to comments by reviewers, we acknowledge that we were unable to find any other instance of CDS like the one recommended being used in the primary care setting. The guidance provided here is based on understanding of factors that raise or lower blood sugar and that impact a person's use of insulin, such as physically demanding work, circumstances that increase cortisone output, or lack of food during periods of low blood sugar. We utilized what we know about factors present at work to provide guidance for management of a patient with diabetes working in those environments.

The overall clinical objectives:

a. Improve the management of diabetes when a patient has workplace factors such as shift work, temperature extremes, exertion variances and time limitations (for medication and proper meals) that can affect blood sugar.

b. Understand how impairment of physical or mental function due to hypoglycemia may impact patient or public safety.

c. Provide what guidance exists for work restrictions for individuals with diabetes.

Our primary recommendation – in the form of a Key Action Statement:

IF:

Patient demonstrates 'not-at-target' diabetes (elevated HgbA1C ≥ 8 is recommended by the Diabetes SME's but this value may be changed by each clinic based on their experience and patient population).

OR

Patient demonstrates symptomatic or serious hypoglycemia (Seaquist, 2013), with 'serious' defined as a situation requiring help from a third party and 'symptomatic' defined as an event during which typical symptoms of hypoglycemia are accompanied by a measured plasma glucose of less than or equal to 70mg/dL.

THEN:

Clinicians should ask about relevant features of current job(s) that are recognized to impact diabetes management: shift work, ability to take breaks, exposure to heat or temperature extremes, ability to eat/drink/take medication as needed, and level of physical activity. The clinician does not have to ask the patient about each job feature individually, but could pose a comprehensive question and gather 'yes' responses to any given job feature. If the patient answers "yes" to any of the features, then the CDS would populate a menu of educational materials to educate/counsel concerning management based on the relevant job characteristics. The clinician could click on one or more materials to be printed for the patient.

Materials will need to be developed that meet the literacy levels of patients and inform non-occupationally trained clinicians about each of these issues without overburdening their limited time. Information on food intake and medication should be included in multiple hand-outs. It is beyond the scope of this group's task to develop these hand-outs. However, the information needed can be found in Appendices 1 through 5.

Programming should be in place such that this CDS does not appear if the patient has been asked about these job features within the past 6 months (as with HgbA1C level, this is the recommendation of the SME's but the time frame may be altered based on clinic experience and patient population).

Rationale for Recommendation

Although diabetes affects 17.7 million working age adults (20-65) with diabetes as of 2012 and there are another 86 million working age adults with prediabetes (Centers for Disease Control and Prevention, 2014), the influence of work schedules and work tasks on management of diabetes is not generally taken into account.

Many jobs require more than the standard 40-hour week (Saad, 2014). In the most recent data available, the Bureau of Labor Statistics (BLS) noted in 2004 that 15 million Americans work full-time irregular schedules. There has not been a repeat study by the BLS since that time but the 2010 National Health Information Survey showed that 28.7% of the working respondents were employed in alternative shifts (Alterman, 2013). The concern about shift work and diabetes has been mentioned in the literature since the 1970s (Winget, 1978). Principles of diabetes control are well discussed in the literature with a recent emphasis on the role of shift work contributing to diabetes development and control. At least 25 articles were published and listed in PubMed from 2013-2014; for example Gan, Y, et al 2014; Kalsbeek, A, et al, 2014; Schiavo-Cardozo, D, et al, 2014. A decision logic has been developed to formalize this concept. (Appendix 1)

Persons with diabetes who aim for tight control or those who use insulin need to be able to regulate their food intake, have a ready supply of water to drink, have a place to store insulin and a place to monitor blood sugars as needed. Not all workplaces are set up to accommodate these needs, not all employers are aware that laws require reasonable accommodation, and not all medical providers enquire about the impact of work on these factors. For example, construction work entails high physical exertion on an irregular schedule, and not all construction sites have running water. A social worker who drives from one client's home to the next may not have an

easy way to keep insulin at a temperature below 86 degrees. A machine operator may only be given a ten-minute break every four hours with no opportunity to check his blood sugar as needed. Practical information on the Americans with Disabilities Act (ADA) can assist primary care providers in counseling their patients, and therefore improve care of diabetes among the workers in these various jobs. (Appendix 2: http://www.eeoc.gov/laws/types/diabetes.cfm)

For some jobs, a worker with impairment of cognition due to low blood sugar could be at risk for injury to himself or to others. If the primary care provider is aware that the patient is in such a job, often referred to as a "safety-sensitive" job, she can adjust treatment to avoid hypoglycemia. Safety-sensitive jobs are ones in which incapacitation of the employee could place the employee or others at risk of harm (e.g., firefighters, police officers, locomotive engineers, commercial truck drivers). A fitness for duty assessment of a person who has diabetes treated with insulin or oral agents with a risk for hypoglycemia must be individualized, taking into consideration the safety-critical nature of a person's work and the importance that the person not experience sudden incapacitation to ensure the safety of the person, co-workers and the public; the nature and severity of the employee's medical condition; whether the person is receiving ongoing evaluation and treatment; the person's compliance with and response to treatment; and the person's ability to recognize symptoms of hypoglycemia and self-manage his or her diabetes.

Commercial truck drivers, airline pilots and locomotive engineers are covered under specific federal regulations; individuals with diabetes may work in these occupations but only under the specific conditions and restrictions outlined in the regulations, and these agencies authorize only certified medical providers to make employment decisions. Determination of the ability of an individual in other safety sensitive occupations may be delegated to the individual's physician. (Appendix 3)

The ADAssn publishes standards of care for diabetes annually (American Diabetes Care, 2014). This set of documents includes a guideline on diabetes in the workplace which explains the legal rights of an employee with diabetes under the ADA, and gives recommendations to primary care providers about workplace accommodations. It also includes guidelines for diabetes self-management.

Guideline(s) used to model the recommendation

We could not find a guideline that specifically addresses management of diabetes during shift work. The guidance provided here is based on our understanding of factors that raise or lower blood sugar and that impact a person's use of insulin, such as physically demanding work, circumstances that increase cortisone output, or lack of food during periods of low blood sugar. This guidance prompts the primary care provider to ask about work factors that may be contributing to poor control of diabetes. This document uses what we know about factors present at work to provide guidance for management of a patient with diabetes working in those environments.

Methods used to search the literature

The range of dates used in our search was not limited. Our search is summarized by the following:

PUBMED/MEDLINE – Diabetes and shift work; Diabetes and heat stress; Diabetes and change in physical activity; Hypoglycemia and work; Hypoglycemia and occupation; Sleep disturbance and diabetes. There were no date limitations for any of the search queries.
We used results to find reviews and then looked for citations to key articles cited in reviews, using PubMed.

The authors used the aggregate evidence quality tool developed by Yale University to assign the grade for the level of scientific evidence/quality.
http://medicine.yale.edu/cmi/glides/index.aspx

Quality Measures
The Diabetes SME's reviewed the sources for quality measures as recommended by NIOSH staff and by a webinar to the SME's by the Joint Commission held on July 30, 2015. We determined that we needed to make sure that any measure that we reference targets an improvement in health, is precisely defined and specific, is interpretable, is under provider control, and does not result in unintended consequences. Clear determination of numerator and denominator needed to be defined and inclusion/exclusion criteria needed to be clear. Practicality for an outpatient setting needed to be considered as well. For these reasons we chose the composite measure of diabetes care from the NQF. That measure is #0729 Optimal Diabetes Care (Composite Measure).
http://www.qualityforum.org/Measures_Reports_Tools.aspx

Each clinic could decide whether they want to see if the measure improves in all their diabetic patients or only in the ones for whom the intervention was implemented - the latter is in our opinion the most practical. Therefore the EHR needs to somehow identify patients for whom the intervention was implemented (see Process Measures below). However, as our SME group has discussed, our relatively simple intervention - increasing awareness by the provider of work factors that may affect diabetes - may not make a big difference in this measure.

Process Measures
Process measurement is simpler and also needs to be tailored to the specific EHR - it is good to measure process by using standard fields that can be easily evaluated with a system generated report rather than some process measure that requires individual review of medical records. Clinics could decide to do that as part of an overall quality improvement around diabetes for which they were doing chart review for other indicators as well. But for this specific intervention, if we were to recommend something that required staff time we doubt it would be done.

Alternative suggestions for process measures are:

- How many times was CDS prompted?
- Did PCP access the CDS when prompted?
- Did PCP download materials for patient?
- Are actions documented in the chart?

There are not standardized measures used for process measurement and the process will depend on the nature of structured fields in each EHR.

One common way to measure quality improvement is through a process called PDSA - plan, do, study, act. For our CDS the plan/do would be to add the content to the EHR, and the study would be to evaluate if the providers review the content and provide materials to the patient. Act would be to change the process somehow if it's not working - discussing it at a team huddle, providing video to the providers on the value, or something else that would increase visibility for this particular action. How the specific PDSA is accomplished would need to be tailored for each EHR.

Evaluation of Recommendation

Level of scientific evidence/quality of evidence

Aggregate Evidence Quality**:** B

Diabetes self-management is supported by a Grade "B" recommendation from the ADAssn. A Grade B recommendation from the ADAssn is based on:

- Supportive evidence from well-conducted cohort studies
- Evidence from a well-conducted prospective cohort study or registry
- Evidence from a well-conducted meta-analysis of cohort studies
- Supportive evidence from a well-conducted case-control study

What scale/criteria were used for determining strength of the Recommendation?

Strength of the recommendation:

B based on ADAssn criteria above.

Benefits and Harms

The benefits of this recommendation are the identification of workplace factors that can contribute to improved diabetes self-management. As noted by reviewers, the harms to using the recommendation are the possibility of causing uncertainty about job security, especially with hypoglycemia/safety sensitive issues or if there are requests for accommodation.

Limitation(s) of the Recommendation

The recommendation does not cover all aspects of workplaces that could interfere with diabetes management. The recommendation also does not cover other complex factors that often occur with diabetes (hypertension, depression, sleep disorders) and that could be influenced by workplace conditions. As noted by reviewers, we did not get into the details of various state and federal requirements, e.g., medical exams under the Federal Motor Carrier Safety Administration (FMSCA) must be performed by a certified examiner, and therefore we don't feel there is a need for the PCP to understand the regulations.

Gaps in the Recommendation

The recommendation cannot cover all work scenarios (works two jobs that are shift work, works full time and then a part-time job, summer work only).

A sample of illustrations/scenarios is included in this report (Attachment 1).

Attachment 1
Illustrations/Scenarios

The following are illustrations of how the recommendation might apply using clinical scenarios with common occupations that a PCP might encounter in a patient population relevant to the recommendation.

Scenario 1 – Uncontrolled Diabetes:

Check in

Patient updates contact information which ideally includes occupation and job duties in the EHR.

Nursing

Vitals, Medication update, Chief complaint updated in EHR

Provider

If there is a coordinator for patients with diabetes, then the coordinator can check the labs, which should be imported into the EHR from the lab, and gather information on work duties and, if trained, discuss work factors and diabetes following the CDS template and referencing the Provider Information (Appendix 4).

If there is no coordinator then the physician would continue through the CDS, which is presented by the EHR because of Hb A1c ≥8 OR history of symptomatic hypoglycemia.
Mr. Sweet, a 35-year-old man with a history of diabetes, hypertension and hyperlipidemia, presents for reevaluation. He brings in his blood glucose readings. He has not had any low blood glucose readings or signs or symptoms of hypoglycemia. He works at the local chemical plant as a process engineer. This is his first visit with the new EHR.

	breakfast	2hr	lunch	2hr	dinner	2 hr	bedtime	Notes
Mon	163			209			182	
Tues								
Wed	105			124	146		137	
Thurs								
Fri	99		129	122			129	
Sat								
Sun	101	130			141		180	Starts 11 pm – 7am.
Mon	7p 235	11p 257						
Tues					7a 294			
Wed			5a 261					
Thurs		11p 263					10a 271	
Fri								
Sat	172		185				178	
Sun								
Mon	158							
Tues							123	

Wed	102				132			
Thurs								
Fri	96							
Sat								
Sun								

The following is clinical information related to his visit – this information is available in the EHR.

Vitals: BP 130/80 Pulse 88 R 16 Pox 98% BMI 37
Labs: ***HgA1c, 3 months ago: 9.6, last week: 9.0*.*** *Basic metabolic panel is normal. Cholesterol well controlled on medication. Normal liver function tests.*
Medications: Metformin 850 mg two times a day, Glipizide 5mg twice a day, Lisinopril 10 mg once a day, Atorvastatin 10mg at night

*The HgA1c ≥8 will trigger the CDS – the CDS will lead the provider to ask the patient if he is working, what his job is, whether his job involves shift work, temperature extremes, or heavy physical activity, and whether his job causes difficulties in allowing him to eat and take medications regularly. In this case, the patient indicates that his job does involved shift work - he alternates between day shift and night shift and finds it difficult to adjust his medication during night shifts. He sometimes skips medication while on night shift because he forgets to take it and is not sure when to take it. He is unable to attend the gym regularly as it is only open during the day.

Based on the information (above) provided during the visit, the CDS will generate the following type of Information Sheet (see Appendix 5 for types of modules/sections that would make up an Information Sheet).

The information sheet is either recorded in the EHR as documentation or a tag is generated in the electronic note indicating the information was reviewed.
The provider is able to view the guidance document.

DIABETES INFORMATION SHEET – Scenario 1:

Schedules that vary from a regular day/night sleep cycle (circadian rhythm) can increase difficulty in blood sugar (glucose) management. Many systems in the body are influenced by the day/night cycle including blood sugar (glucose) regulation. Shift work can complicate medication, diet, and exercise regimens due to the lack of availability of exercise venues, food resources, and uncertainty of medication usage at non-standard hours.

Steps that can be taken to assist in diabetes control include:

- Planning dietary needs in advance so that appropriate food options can be transported to work
- Adjusting medication doses or types to correspond with current wake cycle
- If working a set non-standard shift, maintain the same schedule even when not at work.
- Exercising before or after work depending on the schedule (before work if working the 3-11 shift, after work if working 11-7 for example)

Further reading for physicians

http://www.cdc.gov/niosh/docs/2004-143/pdfs/2004-143.pdf
http://www.diabetes.ca/diabetes-and-you/healthy-living-resources/general-tips/diabetes-shift-work

Further reading for patients:

http://www.diabetes.ca/diabetes-and-you/healthy-living-resources/general-tips/diabetes-shift-work

Diabetes is more easily managed when exercise, medications and food intake is consistent.

Establish a routine
Plan meals ahead of time
Keep healthy snacks available.
Take medications as prescribed.

Further reading for physicians:

http://www.cdc.gov/niosh/docs/2004-143/pdfs/2004-143.pdf
http://www.eatright.org/Public/content.aspx?id=6813

Further reading for patients

http://www.eatright.org/Public/content.aspx?id=6813

AMERICAN WITH DISABILITIES ACT
http://www.diabetes.org/living-with-diabetes/know-your-rights/discrimination/employment-discrimination/reasonable-accommodations-in-the-workplace/common-reasonable-accommodations.html

AMERICAN DIABETES ASSOCIATION
http://www.diabetes.org/living-with-diabetes/
http://www.diabetes.org/diabetes-basics/

Scenario 2 – Symptomatic Hypoglycemia:

Your patient is a 42-year-old man with Type II diabetes who you recently started on insulin because his HbA1c remained at 7.9 despite maximum doses of metformin and glipizide. You ask him to keep detailed records of fasting and random blood sugars along with a diet log for 3 months. On his 3 month visit his HbA1C has improved to 7.2 but he reports he has had symptomatic hypoglycemia on two occasions.

You review results from his glucometer and his diet log, and discuss with him the benefits of tight control and the risk of hypoglycemia. In reviewing his social history you recall that he works as a telephone lineman. Does treatment of his diabetes change because he is in a job with risk for serious falls?

You use the information in the CDS to look at work schedule, physical demand of the job, and other factors presented.

The CDS would also generate an information sheet on work restrictions and information about ADA.

References

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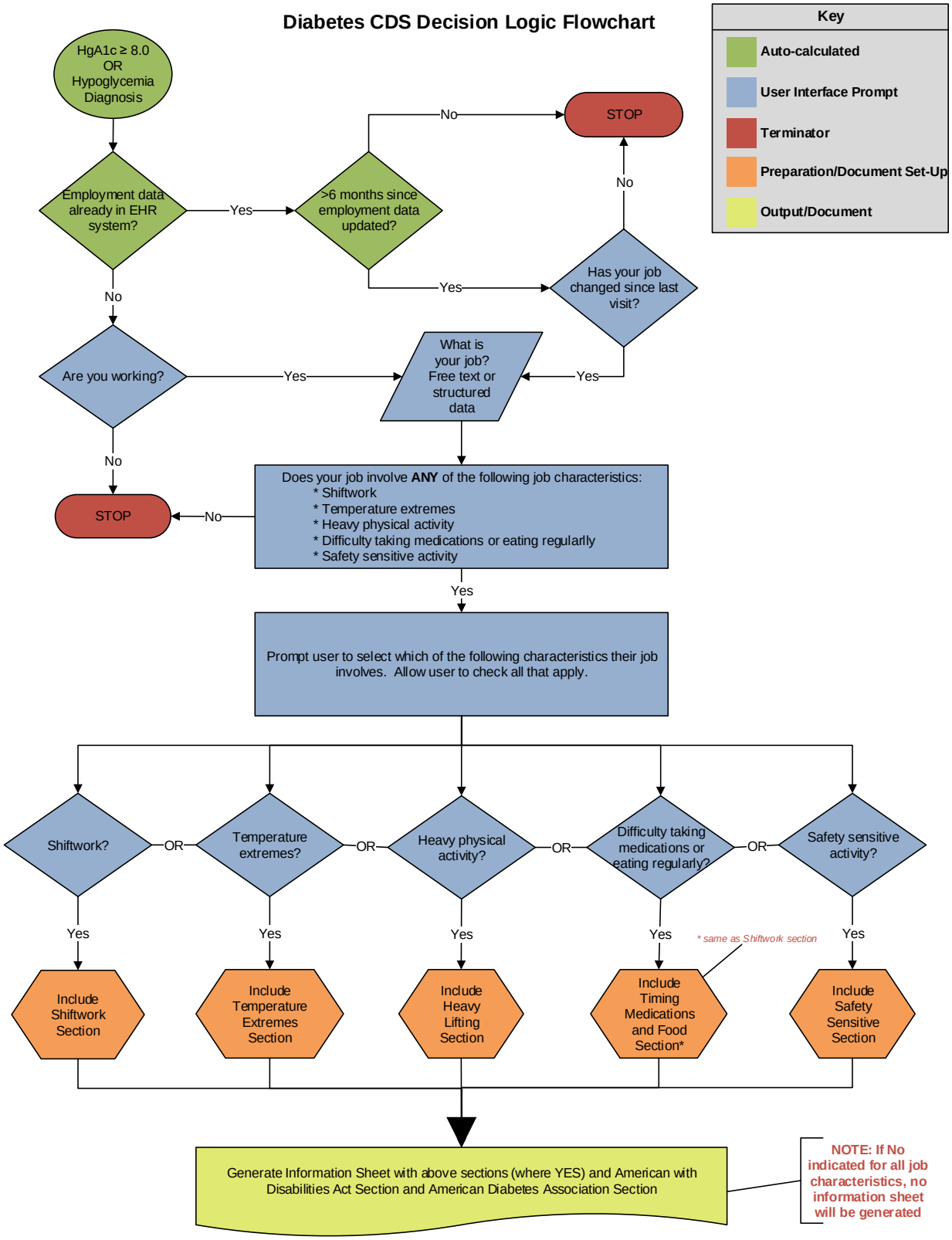
Appendix 1 – Decision Logic



Appendix 2: EEOC Information

(Taken fromhttp://www.eeoc.gov/laws/types/diabetes.cfm)

Questions & Answers about Diabetes in the Workplace and the Americans with Disabilities Act (ADA)[1]

OBTAINING, USING, AND DISCLOSING MEDICAL INFORMATION

Title I of the ADA limits an employer's ability to ask questions related to diabetes and other disabilities and to conduct medical examinations at three stages: pre-offer, post-offer, and during employment.

Job Applicants

Before an Offer of Employment Is Made

1. May an employer ask a job applicant whether she has or had diabetes or about her treatment related to diabetes before making a job offer?

No. An employer may not ask questions about an applicant's medical condition[12] or require an applicant to have a medical examination before it makes a conditional job offer. This means that an employer cannot legally ask an applicant questions such as:

- whether she has diabetes or has been diagnosed with diabetes (for example, gestational diabetes) in the past;
- whether she uses insulin or other prescription drugs or has ever done so in the past; or,
- whether she ever has taken leave for medical treatment, or how much sick leave she has taken in the past year.

Of course, an employer may ask questions pertaining to the qualifications for, or performance of, the job, such as whether the applicant has a commercial driver's license or whether she can work rotating shifts.

2. Does the ADA require an applicant to disclose that she has or had diabetes or some other disability before accepting a job offer?

No. The ADA does not require applicants to voluntarily disclose that they have or had diabetes or another disability unless they will need a reasonable accommodation for the application process (for example, a break to eat a snack or monitor their glucose levels). Some individuals with diabetes, however, choose to disclose their condition because they want their co-workers or supervisors to know what to do if they faint or experience other symptoms of hypoglycemia (low blood sugar), such as weakness, shakiness, or confusion.[13]

Sometimes, the decision to disclose depends on whether an individual will need a reasonable accommodation to perform the job (for example, breaks to take medication or a place to rest until blood sugar levels become normal). A person with diabetes, however, may request an accommodation after becoming an employee even if she did not do so when applying for the job or after receiving the job offer.

3. May an employer ask any follow-up questions if an applicant voluntarily reveals that she has or had diabetes?

[1] EEOC accessed 9/8/14 http://www.eeoc.gov/laws/types/diabetes.cfm

No. An employer generally may not ask an applicant who has voluntarily disclosed that she has diabetes any questions about her diabetes, its treatment, or its prognosis. However, if an applicant voluntarily discloses that she has diabetes **and the employer reasonably believes that she will require an accommodation to perform the job because of her diabetes or treatment**, the employer may ask whether the applicant will need an accommodation and what type. The employer must keep any information an applicant discloses about her medical condition confidential. (See "Keeping Medical Information Confidential.")

Example 1: An individual applying for a cashier's position at a grocery store voluntarily discloses that she has diabetes and periodically needs to administer insulin and monitor her blood sugar levels. The employer explains that cashiers typically get two 15-minute breaks and 30 minutes for lunch during an eight-hour shift and asks whether she needs an accommodation (for example, more frequent breaks or a longer lunch period). Before an offer of employment is made, the employer may not ask any questions about the condition itself, such as how long the applicant has had diabetes, how much medication she takes, or whether anyone else in her family has diabetes.[14]

After an Offer of Employment Is Made

After making a job offer, an employer may ask questions about the applicant's health (including questions about the applicant's disability) and may require a medical examination, as long as all applicants for the same type of job are treated equally (that is, all applicants are asked the same questions and are required to take the same examination). After an employer has obtained basic medical information from all individuals who have received job offers, it may ask specific individuals for more medical information if it is medically related to the previously obtained medical information. For example, if an employer asks all applicants post-offer about their general physical and mental health, it can ask individuals who disclose a particular illness, disease, or impairment for more medical information or require them to have a medical examination related to the condition disclosed.

4. What may an employer do when it learns that an applicant has or had diabetes after she has been offered a job but before she starts working?

When an applicant discloses after receiving a conditional job offer that she has diabetes, an employer may ask the applicant additional questions such as how long she has had diabetes; whether she uses insulin or oral medication; whether and how often she experiences hypoglycemic episodes; and/or whether she will need assistance if her blood sugar level drops while at work. The employer also may send the applicant for a follow-up medical examination or ask her to submit documentation from her doctor answering questions specifically designed to assess her ability to perform the job's functions safely. Permissible follow-up questions at this stage differ from those at the pre-offer stage when an employer only may ask an applicant who voluntarily discloses a disability whether she needs an accommodation to perform the job and what type.

An employer may not withdraw an offer from an applicant with diabetes if the applicant is able to perform the essential functions of the job, with or without reasonable accommodation, without posing a direct threat (that is, a significant risk of substantial harm) to the health or safety of himself or others that cannot be eliminated or reduced through reasonable accommodation. ("Reasonable accommodation" is discussed at Questions 10 through 15. "Direct threat" is discussed at Questions 6 and 16 through 18.)

Example 2: A qualified candidate for a police officer's position is required to have a medical exam after he has been extended a job offer. During the exam, he reveals that he has had diabetes for five years. He also tells the doctor that since he started using an insulin pump two years ago, his blood sugar levels have been stable. The candidate also mentions that in his six years as a police officer for another department, he never had an incident related to his diabetes. Because the candidate can perform the job's essential functions without posing a direct threat, it would be unlawful for the employer to withdraw the job offer.

Employees

The ADA strictly limits the circumstances under which an employer may ask questions about an employee's medical condition or require the employee to have a medical examination. Once an employee is on the job, her actual performance is the best measure of ability to do the job.

5. When may an employer ask an employee whether diabetes, or some other medical condition, may be causing her performance problems?

Generally, an employer may ask disability-related questions or require an employee to have a medical examination when it knows about a particular employee's medical condition, has observed performance problems, and reasonably believes that the problems are related to a medical condition. At other times, an employer may ask for medical information when it has observed symptoms, such as extreme fatigue or irritability, or has received reliable information from someone else (for example, a family member or co-worker) indicating that the employee may have a medical condition that is causing performance problems. Often, however, poor job performance is unrelated to a medical condition and generally should be handled in accordance with an employer's existing policies concerning performance.[15]

Example 3: Several times a day for the past month, a receptionist has missed numerous phone calls and has not been at her desk to greet clients. The supervisor overhears the receptionist tell a co-worker that she feels tired much of the time, is always thirsty, and constantly has to go to the bathroom. The supervisor may ask the receptionist whether she has diabetes or send her for a medical examination because he has a reason to believe that diabetes may be affecting the receptionist's ability to perform one of her essential duties - sitting at the front desk for long periods of time.

Example 4: A normally reliable secretary with diabetes has been coming to work late and missing deadlines. The supervisor observed these changes soon after the secretary started going to law school in the evenings. The supervisor can ask the secretary why his performance has declined but may not ask him about his diabetes unless there is objective evidence that his poor performance is related to his medical condition.

6. May an employer require an employee on leave because of diabetes to provide documentation or have a medical examination before allowing her to return to work?

Yes. If the employer has a reasonable belief that the employee may be unable to perform her job or may pose a direct threat to herself or others, the employer may ask for medical information. However, the employer may obtain only the information needed to make an assessment of the employee's present ability to perform her job and to do so safely.

Example 5: A newspaper reporter, who has been on leave for two months because of complications stemming from her diabetes, notifies her employer that she will be able to return to work in two weeks but will need a flexible schedule. Because the reporter's job frequently requires her to meet short deadlines, the employer may ask her to provide a doctor's note or other documentation indicating whether there are any limits on how many hours a day she can work.

7. Are there any other instances when an employer may ask an employee with diabetes about his condition?

Yes. An employer also may ask an employee about diabetes when it has a reasonable belief that the employee will be unable to safely perform the essential functions of his job because of diabetes. In addition, an employer may ask an employee about his diabetes to the extent the information is necessary:

- to support the employee's request for a reasonable accommodation needed because of his diabetes;
- to verify the employee's use of sick leave related to his diabetes if the employer requires all employees to submit a doctor's note to justify their use of sick leave; [16] or
- to enable the employee to participate in a voluntary wellness program.[17]

Keeping Medical Information Confidential

With limited exceptions, an employer must keep confidential any medical information it learns about an applicant or employee. Under the following circumstances, however, an employer may disclose that an employee has diabetes:

- to supervisors and managers in order to provide a reasonable accommodation or to meet an employee's work restrictions;
- to first aid and safety personnel if an employee may need emergency treatment or require some other assistance because, for example, her blood sugar level is too low;
- to individuals investigating compliance with the ADA and similar state and local laws; and
- where needed for workers' compensation or insurance purposes (for example, to process a claim).

8. May an employer tell employees who ask why their co-worker is allowed to do something that generally is not permitted (such as eat at his desk or take more breaks) that she is receiving a reasonable accommodation?

No. Telling co-workers that an employee is receiving a reasonable accommodation amounts to a disclosure that the employee has a disability. Rather than disclosing that the employee is receiving a reasonable accommodation, the employer should focus on the importance of maintaining the privacy of all employees and emphasize that its policy is to refrain from discussing the work situation of any employee with co-workers. Employers may be able to avoid many of these kinds of questions by training all employees on the requirements of equal employment opportunity laws, including the ADA.

Additionally, an employer will benefit from providing information about reasonable accommodations to all of its employees. This can be done in a number of ways, such as through written reasonable accommodation procedures, employee handbooks, staff meetings, and

periodic training. This kind of proactive approach may lead to fewer questions from employees who misperceive co-worker accommodations as "special treatment."

9. If an employee experiences a hypoglycemic reaction at work (see definition on page 1), may an employer explain to other employees or managers that the employee has diabetes?
No. Although the employee's co-workers and others in the workplace who witness the reaction naturally may be concerned, an employer may not reveal that the employee has diabetes. Rather, the employer should assure everyone present that the situation is under control. An employee, however, may voluntarily choose to tell her co-workers that she has diabetes and provide them with helpful information, such as how to recognize when her blood sugar may be low, what to do if she faints or seems shaky or confused (for example, offer a piece of candy or gum), or where to find her glucose monitoring kit. However, even when an employee voluntarily discloses that she has diabetes, the employer must keep this information confidential consistent with the ADA. An employer also may not explain to other employees why an employee with diabetes has been absent from work if the absence is related to her diabetes or another disability.

ACCOMMODATING EMPLOYEES WITH DIABETES

The ADA requires employers to provide adjustments or modifications -- called reasonable accommodations -- to enable applicants and employees with disabilities to enjoy equal employment opportunities unless doing so would be an undue hardship (that is, a significant difficulty or expense). Accommodations vary depending on the needs of the individual with a disability. Not all employees with diabetes will need an accommodation or require the same accommodations, and most of the accommodations a person with diabetes might need will involve little or no cost. An employer must provide a reasonable accommodation that is needed because of the diabetes itself, the effects of medication, or both. For example, an employer may have to accommodate an employee who is unable to work while learning to manage her diabetes or adjusting to medication. An employer, however, has no obligation to monitor an employee to make sure that she is regularly checking her blood sugar levels, eating, or taking medication as prescribed.

10. What other types of reasonable accommodations may employees with diabetes need?
Some employees may need one or more of the following accommodations:

- a private area to test their blood sugar levels or to administer insulin injections
- a place to rest until their blood sugar levels become normal
- breaks to eat or drink, take medication, or test blood sugar levels

Example 6: A manufacturing plant requires employees to work an eight-hour shift with just a one-hour break for lunch. An employee with diabetes needs to eat several times a day to keep his blood sugar levels from dropping too low. Absent undue hardship, the employer could accommodate the employee by allowing him to take two 15-minute breaks each day and letting him make up the time by coming to work 15 minutes earlier and staying 15 minutes later.

- leave for treatment, recuperation, or training on managing diabetes[18]
- modified work schedule or shift change

Example 7: A nurse with diabetes rotated from working the 6:00 a.m. to 2:00 p.m. shift to the midnight to 8:00 a.m. shift. Her doctor wrote a note indicating that interferences in the nurse's

sleep, eating routine, and schedule of insulin shots were making it difficult for her to manage her diabetes. Her employer eliminated her midnight rotation.

- allowing a person with diabetic neuropathy[19] that makes it difficult to stand for long periods of time to use a stool
- reallocation or redistribution of marginal tasks to another employee

Example 8: A janitor, who had a leg amputated because of complications from diabetes, can perform all of his essential job functions without accommodation but has difficulty climbing into the attic to occasionally change the building's air filter. The employer likely can reallocate this marginal function to one of the other janitors.

- reassignment to a vacant position when the employee is no longer able to perform his current job

Example 9: Following complications from neuropathy that resulted in a toe amputation, a hotel housekeeper requests to be reassigned to a laundress position because the job would require less walking. Although the employer does not have to "bump" another employee to create a vacancy, it should determine whether the housekeeper is qualified for the new position and whether it would be an undue hardship to reassign her. The vacant position must be equivalent in terms of pay and status to the original job, or as close as possible if no equivalent position exists. The position need not be a promotion, although the employee should be able to compete for any promotion for which she is eligible.

Although these are some examples of the types of accommodations commonly requested by employees with diabetes, other employees may need different changes or adjustments. Employers should ask the particular employee requesting an accommodation what he needs that will help him do his job. There also are extensive public and private resources to help employers identify reasonable accommodations. For example, the website for the Job Accommodation Network (JAN) (http://askjan.org/media/Diabetes.html) provides information about many types of accommodations for employees with diabetes.

11. How does an employee with diabetes request a reasonable accommodation?

There are no "magic words" that a person has to use when requesting a reasonable accommodation. A person simply has to tell the employer that she needs an adjustment or change at work because of her diabetes. A request for a reasonable accommodation also can come from a family member, friend, health professional, or other representative on behalf of a person with diabetes.

Example 10: A custodian tells his supervisor that he was recently diagnosed with diabetes and needs a week off to attend a class on how to manage the condition. If leave for this length of time and/or for this reason would not be allowed under an existing leave policy, the employee's request for leave is a request for reasonable accommodation (for example, an exception to or modification of the leave policy).

12. May an employer request documentation when an employee who has diabetes requests a reasonable accommodation?

Yes. An employer may request reasonable documentation where a disability or the need for reasonable accommodation is not known or obvious. An employer, however, is entitled only to

documentation sufficient to establish that the employee has diabetes and to explain why an accommodation is needed. A request for an employee's entire medical record, for example, would be inappropriate as it likely would include information about conditions other than the employee's diabetes.[20]

Example 11: When an employee asks for one week of unpaid leave to attend a class on how to manage his recently diagnosed diabetes, his employer asks for a letter from the employee's doctor. The employee submits a letter from his endocrinologist stating that the employee has been diagnosed with Type 2 diabetes and that the one-week class will teach him how to monitor his blood glucose levels, administer insulin injections, and plan his meals. The doctor's letter is sufficient to demonstrate that the employee has a disability and needs the requested reasonable accommodation. If the employee makes a subsequent accommodation request related to his diabetes (for example, asks for a shift change) and the need for accommodation is not obvious, the employer may ask for documentation explaining why the new accommodation is needed but may not ask for documentation concerning his diabetes diagnosis.

13. Does an employer have to grant every request for a reasonable accommodation?
No. An employer does not have to provide an accommodation if doing so will be an undue hardship. Undue hardship means that providing the reasonable accommodation will result in significant difficulty or expense. An employer also does not have to eliminate an essential function of a job as a reasonable accommodation, tolerate performance that does not meet its standards, or excuse violations of conduct rules that are job-related and consistent with business necessity and that the employer applies consistently to all employees (such as rules prohibiting violence, threatening behavior, theft, or destruction of property).
If more than one accommodation will be effective, the employee's preference should be given primary consideration, although the employer is not required to provide the employee's first choice of reasonable accommodation. If a requested accommodation is too difficult or expensive, an employer may choose to provide an easier or less costly accommodation as long as it is effective in meeting the employee's needs.

14. May an employer be required to provide more than one accommodation for the same employee with diabetes?
Yes. The duty to provide a reasonable accommodation is an ongoing one. Although some employees with diabetes may require only one reasonable accommodation, others may need more than one. For example, an employee with diabetes may require leave to attend a class on how to administer insulin injections and later may request a part-time or modified schedule to better control his glucose levels. An employer must consider each request for a reasonable accommodation and determine whether it would be effective and whether providing it would pose an undue hardship.

15. May an employer automatically deny a request for leave from someone with diabetes because the employee cannot specify an exact date of return?
No. Granting leave to an employee who is unable to provide a fixed date of return may be a reasonable accommodation. Although diabetes can be successfully treated, some individuals experience serious complications that may be unpredictable and do not permit exact timetables. An employee requesting leave because of diabetes or resulting complications (for example, a

foot or toe amputation), therefore, may be able to provide only an approximate date of return (e.g., "in six to eight weeks," "in about three months"). In such situations, or in situations in which a return date must be postponed because of unforeseen medical developments, employees should stay in regular communication with their employers to inform them of their progress and discuss the need for continued leave beyond what originally was granted. The employer also has the right to require that the employee provide periodic updates on his condition and possible date of return. After receiving these updates, the employer may reevaluate whether continued leave constitutes an undue hardship.

CONCERNS ABOUT SAFETY

When it comes to safety concerns, an employer should be careful not to act on the basis of myths, fears, or stereotypes about diabetes. Instead, the employer should evaluate each individual on her skills, knowledge, experience and how having diabetes affects her.

16. When may an employer refuse to hire, terminate, or temporarily restrict the duties of a person who has diabetes because of safety concerns?

An employer only may exclude an individual with diabetes from a job for safety reasons when the individual poses a direct threat. A "direct threat" is a significant risk of substantial harm to the individual or others that cannot be eliminated or reduced through reasonable accommodation.[21] This determination must be based on objective, factual evidence, including the best recent medical evidence and advances in the treatment of diabetes.

In making a direct threat assessment, the employer must evaluate the individual's present ability to safely perform the job. The employer also must consider:

1. the duration of the risk;
2. the nature and severity of the potential harm;
3. the likelihood that the potential harm will occur; and
4. the imminence of the potential harm.[22]

The harm must be serious and likely to occur, not remote or speculative. Finally, the employer must determine whether any reasonable accommodation (for example, temporarily limiting an employee's duties, temporarily reassigning an employee, or placing an employee on leave) would reduce or eliminate the risk.[23]

Example 12: At his post-offer medical examination, an applicant for a machine operator position admitted that because he often does not take his insulin as prescribed or monitor what he eats, he sometimes feels confused when his glucose levels drop too low. Based on the applicant's admitted history of noncompliance, the high temperatures in the plant, and the fact that the applicant would have to climb tall ladders and operate dangerous machinery, the doctor concluded that the applicant could seriously injure himself if his unregulated diabetes made him lose consciousness or become disoriented. Relying on the doctor's assessment that the applicant would pose a significant risk of substantial harm, the employer lawfully rescinded the conditional job offer.

Example 13: When an actor forgets his lines and stumbles during several recent play rehearsals, he explains that the fluctuating rehearsal times are interfering with when he eats and takes his insulin. Because there is no reason to believe that the actor poses a direct threat, the director cannot terminate the actor or replace him with an understudy; rather, the director should consider

whether rehearsals can be held at a set time and/or whether the actor can take a break when needed to eat, monitor his glucose, or administer his insulin

17. May an employer require an employee who has had an insulin reaction (hypoglycemia) at work to submit periodic notes from his doctor indicating that his diabetes is under control?

Yes, but only if the employer has a reasonable belief that the employee will pose a direct threat if he does not regularly see his doctor. In determining whether to require periodic documentation, the employer should consider the safety risks associated with the position the employee holds, the consequences of the employee's inability or impaired ability to perform his job, how long the employee has had diabetes, and how many insulin reactions the employee has had on the job.

Example 14: Four times in the past two months, a telephone repair technician had a hypoglycemic reaction right before climbing a pole and was unable to do his job. The repair technician explained that he was using a new type of insulin and that his blood sugar levels occasionally dropped too low. Given the safety risks associated with the repair technician's job, his change in medication, and recurrent hypoglycemic reactions, the employer could ask for periodic documentation to make sure that the repair technician does not pose a direct threat to himself or others.

Example 15: The owner of a daycare center knows that one of her teachers has diabetes and that she once had an insulin reaction (hypoglycemic reaction) at work when she skipped lunch. When the owner sees the teacher eat a piece of cake at a child's birthday party, she becomes concerned that the teacher may have an insulin reaction. Although many people believe that individuals with diabetes should never eat sugar or sweets, this is a myth. The owner, therefore, cannot require the teacher to submit periodic notes from her doctor indicating that her diabetes is under control because she does not have a reasonable belief, based on objective evidence, that the teacher will pose a direct threat to the safety of herself or others.

18. What should an employer do when another federal law prohibits it from hiring anyone who uses insulin?

If a federal law prohibits an employer from hiring a person who uses insulin, the employer is not liable under the ADA. The employer should be certain, however, that compliance with the law actually is required, not voluntary. The employer also should be sure that the law does not contain any exceptions or waivers. For example, the Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA) issues exemptions to certain individuals with diabetes who wish to drive commercial motor vehicles (CMVs).[24]

Footnotes

[1] See 42 U.S.C. §12102(2); 29 C.F.R. §1630.2(g).
[2] For example, disability laws in California, Pennsylvania, New Jersey, and New York apply to employers with fewer than 15 employees.
[3] See "The Question and Answer Series" under "Available Resources" on EEOC's website at www.eeoc.gov/laws/types/disability.cfm.
[4] See Diabetes Basics, www.diabetes.org/diabetes-basics (last visited January 10, 2013); see also www.diabetes.org/diabetes-basics/gestational/

[5] Id.; see also information on diabetes from the National Institutes of Health, www.nlm.nih.gov/medlineplus/diabetes.html.
[6] Diabetes Basics, supra note 4.
[7] According to the Centers for Disease Control and Prevention (CDC), about 1.9 million people aged 20 or older were newly diagnosed with diabetes in the United States in 2010. See National Diabetes Fact Sheet (2011), http://www.cdc.gov/diabetes/pubs/factsheet11.htm (last visited January 10, 2013); see also Endocrine Diseases, www.nim.nih.gov/medlineplus/endocrinediseases.html#cat1.
[8] See 2011 National Diabetes Fact Sheet (released January 26, 2011), www.diabetes.org/diabetes-basics/diabetes-statistics (last visited January 13, 2013).
[9] See 29 C.F.R. §1630.2(j)(3)(iii).
[10] Id. at §1630.2(k).
[11] Id. at §1630.2(l).
[12] Federal contractors are required under 41 C.F.R. § 60-741.42, a regulation issued by the Office of Federal Contract Compliance Programs (OFCCP), to invite applicants to voluntarily self-identify as persons with disabilities for affirmative action purposes. The ADA prohibition on asking applicants about medical conditions at the pre-offer stage does not prevent federal contractors from complying with the OFCCP's regulation. See Letter from Peggy R. Mastroianni, EEOC Legal Counsel, to Patricia A. Shiu, Director of OFCCP, www.dol.gov/ofccp/regs/compliance/section503.htm#bottom.
[13] Insulin and some oral medications can sometimes cause a person's blood sugar levels to drop too low. A person experiencing hypoglycemia (low blood sugar) may feel weak, shaky, confused, or faint. Most people with diabetes, however, recognize these symptoms and will immediately drink or eat something sweet. Many individuals with diabetes also carry a blood glucose monitoring kit with them at all times and test their blood sugar levels as soon as they feel minor symptoms such as shaking or sweating. Often, a person's blood sugar returns to normal within 15 minutes of eating or drinking something sweet. See generally information from the American Association of Diabetes, www.diabetes.org.
[14] Asking an applicant or employee about family medical history also violates Title II of the Genetic Information Nondiscrimination Act (GINA), 42 U.S.C. 2000ff et seq., which prohibits employers from requesting, requiring, or purchasing genetic information (including family medical history) about applicants or employees. 29 C.F.R. §1635.8(a).
[15] An employer also may ask an employee about his diabetes or send the employee for a medical examination when it reasonably believes the employee may pose a direct threat because of his diabetes. See "Concerns About Safety."
[16] An employer also may ask an employee for periodic updates on his condition if the employee has taken leave and has not provided an exact or fairly specific date of return or has requested leave in addition to that already granted. See also Q&A 15. Of course, an employer may call employees on extended leave to check on their progress or to express concern for their health without violating the ADA.
[17] The ADA allows employers to conduct voluntary medical examinations and activities, including obtaining voluntary medical histories, which are part of an employee wellness program (such as a smoking cessation or diabetes detection screening and management program), as long as any medical records (including, for example, the results any diagnostic tests) acquired as part of the program are kept confidential. See Q&A 22 in EEOC Enforcement Guidance on

Disability-Related Inquiries and Medical Examinations of Employees under the ADA, http://www.eeoc.gov/policy/docs/guidance-inquiries.html.

[18] An employee with diabetes who needs continuing or intermittent leave, or a part-time or modified schedule, as a reasonable accommodation also may be entitled to leave under the Family and Medical Leave Act (FMLA). For a discussion of how employers should treat situations in which an employee may be covered both by the FMLA and the ADA, see Questions 21 and 23 in the EEOC Enforcement Guidance on Reasonable Accommodation and Undue Hardship Under the Americans with Disabilities Act (rev. Oct. 17, 2002) at www.eeoc.gov/policy/docs/accommodation.html.

[19] Diabetic neuropathy is a common complication of diabetes in which nerves are damaged as a result of high blood sugar levels (hyperglycemia). See National Center for Biotechnology Information, U.S. National Library of Medicine, www.ncbi.nlm.nih.gov.

[20] Requests for documentation to support a request for accommodation may violate Title II of GINA where they are likely to result in the acquisition of genetic information, including family medical history. 29 C.F.R. §1635.8(a). For this reason employers may want to include a warning in the request for documentation that the employee or the employee's doctor should not provide genetic information. Id. at §1635.8(b)(1)(i)(B).

[21] See 29 C.F.R. §1630.2(r).

[22] Id.

[23] Id.

[24] Under FMCSA's Diabetes Exemption Program, an individual who intends to operate a CMV in interstate commerce may apply for an exemption from the diabetes standard if he or she meets all medical standards and guidelines, other than diabetes, in accordance with 49 CFR §391.41 (b) (1-13).

Appendix 3: Fitness for Duty

The standard of care for diabetes recommend a reduction of average plasma glucose to near normal levels to prevent or slow serious complications of diabetes, but treatment to this target can result in hypoglycemia. Hypoglycemia that results in physical or cognitive function may put an individual at risk of injury in certain jobs, and so HCPs should be aware of whether or not their patients with diabetes work in such positions and of relevant guidelines and/or laws that may be applicable.

Employment decisions are generally governed by the Americans with Disabilities. The ADA limits an employer's ability to obtain information on medical conditions before offering a job to an individual, and post-offer requires reasonable accommodation of any disability present. The ADA is a federal law that prohibits discrimination against qualified individuals with disabilities, and diabetes is a qualifying disability. These provisions of the ADA cover employment by private employers with 15 or more employees as well as state and local government employers, and are enforced by the U.S. Equal Employment Opportunity Commission (EEOC). The EEOC provides information regarding:

- when an employer may ask an applicant or employee questions about her diabetes and how it should treat voluntary disclosures;
- what types of reasonable accommodations employees with diabetes may need;
- how an employer should handle safety concerns about applicants and employees with diabetes; and
- how an employer can ensure that no employee is harassed because of diabetes or any other disability.

Safety sensitive occupations: Safety-sensitive jobs are ones in which incapacitation of the employee could place the employee or others at risk of harm (e.g., firefighters, police officers, locomotive engineers, commercial truck drivers). Medical inquiry and medical standards that would violate the ADA for other occupations are permissible for safety-sensitive jobs.

The standard of care for diabetes recommends a reduction of average plasma glucose to near normal levels to prevent or slow serious complications of diabetes; treatment to this target can result in hypoglycemia. The main focus of fitness for duty in persons with diabetes in a safety-sensitive position is the risk he/she will experience during a hypoglycemic event that interferes with cognitive or physical functioning while working; hyperglycemia is unlikely to cause sudden incapacitation. Hypoglycemia is common among individuals using insulin and oral hypoglycemic, but hypoglycemia severe enough to cause incapacitation is much less common.

Commercial truck drivers, airline pilots [and locomotive engineers] are covered under specific federal regulations; individuals with diabetes may work in these occupations but only under the specific conditions and restrictions outlined in the regulations, and these agencies authorize only certified medical providers to make employment decisions. Determination of the ability of an individual in other safety sensitive occupations may be delegated to the individual's physician.

A fitness for duty assessment of a person who has diabetes treated with insulin or oral agents with a risk for hypoglycemia must be individualized, taking into consideration the safety-critical

nature of a person's work and the importance that the person not experience sudden incapacitation to ensure the safety of the person, co-workers and the public; the nature and severity of the employee's medical condition; whether the person is receiving ongoing evaluation and treatment; the person's compliance with and response to treatment; and the person's ability to recognize symptoms of hypoglycemia and self-manage his or her diabetes.

To make this assessment the medical provider should:

- Ensure the patient uses regular glucose measurements and knows how and when to treat hypoglycemia
- Review records of those measurements of blood glucose with the patient
- Obtain a history of all episodes of severe hypoglycemic events, identify the cause and change treatment as needed
- Ensure the patient has a source of glucose available at all times during a work shift, and is able to access and use it when needed.

Further reading:

Americans Diabetes Association: http://www.diabetes.org/living-with-diabetes/know-your-rights/discrimination/employment-discrimination/

Americans Diabetes Association position statement – http://care.diabetesjournals.org/content/37/Supplement_1/S112.full.pdf+html?sid=9b467bce-e745-4e9a-b706-afa5b3fbd85f

Equal Employment Opportunity Commission (EEOC) Q+A: http://www.eeoc.gov/laws/types/diabetes.cfm

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Appendix 4 – Provider Information on Diabetes and the Workplace

Diabetes and Work

1. Diabetes and Work Schedules

A. Shift Work

Concern about the health effects of shift work on diabetes management and contribution to diabetes has been discussed since the 1970's (Winget, 1978). Shift work can be defined in many ways: irregular work hours, set work hours outside of a 'standard' work day (7 am -5 pm), rotating schedules that require varying the time of day or night worked. This section (Section 1.A) of this Appendix examines issues related to set work hours outside of a standard work day and rotating shifts. Detailed information related to irregular work hours is limited, as noted in Section C below ("Multiple Jobs or Irregular Work Schedules"). The meta-analysis of the literature by Gan (2014) indicates there is correlation between diabetes and shift work with the most marked effects in men and those working rotating shifts.

Physiologic changes

Sleep patterns influence metabolic functioning in inflammation responses, hormones that control hunger, lipid metabolism, and glucose metabolism. The suprachiasmic nucleus in the hypothalamus is the central clock with signals that vary on a 24 hour cycle.

Studies have shown that insulin resistance increased, glucose levels are higher, cortisol levels peek during the beginning of the sleep cycle, and leptin decreases (Scheer, 2009). Ghrelin increased after sleep restriction (Spiegel, 2004). There is also tendency towards increased adipose deposition and poorer eating habits (Schiavo, 2013) which can cause difficulty with diabetes control and possible progression of the disease.

Long term set shift work may allow for adjustment, but many people are unable to maintain the set shift once away from work (Roden, 1993). Organ systems in knock out models adapt at various rates to sleep wake cycle changes (Kalsbeek, 2014), so rotating shift work would be more difficult on the body than a set work shift.

Lifestyle

Shift work causes alteration in diet, exercise, and socialization patterns that can contribute to difficulty with glucose management and weight management. This can lead to progression of diabetes. (Atkinson, 2008)

B. Overtime

The main challenges with overtime are the variation in meal, activity, and sleep patterns that were discussed in the shift work section. Overtime and shift work have not been studied in the context of diabetes but two complicated work situations are likely to cause further difficulty with diabetes control (and prevention).

C. Multiple Jobs or Irregular Work Schedules

Again, lack of regular activity, meals, and sleep will complicate diabetes management. No specific studies available at this time.

2. Diabetes and Work Conditions

The response of people with diabetes to environmental conditions may be blunted due to the side effects of the disease or disease treatment. Standard treatment for new onset type 2

diabetes includes metformin, ACE inhibitor and a statin, all of which have their own side effects. Also the progression of diabetes which includes nephropathy, retinopathy, autonomic dysfunction, cardiovascular disease, and neuropathy can cause difficulty in some work environments.

A. Dehydration

Early in the disease, dehydration is less likely to cause severe metabolic issues. However as disease progresses, dehydration can exacerbate kidney disease and heart disease and heat stress. Also poor control of diabetes causes an increased need for water intake and can increase the risk of dehydration.

B. Temperature Extremes

Diabetes (Type 1 and 2) is associated with decreased vasodilator response and sweat response. This can be exacerbated by obesity and medications use to treat diabetes and its complications. Medications can cause increased heat production or decreased heat loss. (Yardley, 2013; Heimhalt-ElHamriti, 2013)

Comorbid heart disease can be exacerbated by temperature extremes and medications that interfere with thermoregulation and orthostasis. Aging also blunts the ability to thermoregulate efficiently.

C. Lighting

Progression of vision problems could cause difficulty in activities that require activities in varied lighting conditions. Retinopathy and cataracts interfere with night vision, whereas cataracts can cause visual issues in high glare conditions.

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Appendix 5: Diabetes Information Sheet (patient)

Shiftwork

Schedules that vary from a regular day/night sleep cycle (circadian rhythm) can increase difficulty in blood sugar (glucose) management. Many systems in the body are influenced by the day/night cycle including blood sugar (glucose) regulation. Shiftwork can complicate medication, diet and exercise regimens due to the lack of availability of exercise venues, food resources and uncertainty of medication usage at non-standard hours.

Steps that can be taken to assist in diabetes control include:

- Planning dietary needs in advance so that appropriate food options can be transported to work
- Adjusting medication doses to correspond with current wake cycle.
- If working a set non-standard shift, maintain the same schedule even when not at work.
- Exercising before or after work depending on the schedule (before work if working the 3-11 shift, after work if working 11-7 for example)

Further reading:

http://www.cdc.gov/niosh/docs/2004-143/pdfs/2004-143.pdf
http://www.diabetes.ca/diabetes-and-you/healthy-living-resources/general-tips/diabetes-shift-work

Patient Guidance

Diabetes is more easily managed when exercise, medications and food intake is consistent.

Establish a routine
Plan meals ahead of time
Keep healthy snacks available.
Take medications as prescribed.

Temperature Extremes

Diabetes can interfere with the body's ability to regulate body temperature. The medications used to treat the both the disease and its complications can also cause difficulty tolerating temperature extremes, both hot and cold.

In hot weather, diabetes can decrease the awareness of the effect of heat. Body temperature may increase more before being noticed. Also the ability to sweat can be impaired by diabetes and medications for high blood pressure (hypertension). Some medications increase the risk of dehydration.

In cold weather, the body is not able to respond as efficiently to the cold weather to maintain circulation to the extremities. With more severe diabetes, the ability to sense the warning signs of frostbite, such as pain from prolonged cold exposure, are decreased.

Further reading:

http://www.cdc.gov/features/DiabetesHeatTravel/
http://www.cdc.gov/niosh/docs/2011-174/pdfs/2011-174.pdf

Patient Guidance

Keep plenty of water with you and drink water regularly. A general assessment of hydration is that your urine should be clear or light yellow in color.

Know where cool areas or shade are available should you feel overheated.

If possible, gradually increase your exposure to heat so you can adjust to your body's needs.

In colder conditions, be aware of your fingers and toes as they are most likely to show signs of frostnip or frostbite first.

Stay warm and dry while working in cold conditions.

Do regular foot checks at home while working in cold conditions.

Physical Activity

Physical activity is encouraged for those with diabetes, however abrupt changes in activity can cause abrupt drop in blood sugar (glucose). This can be managed with increasing the amount of calories or carbohydrates consumed or adjusting medication usage (decreasing dose or change in timing). Caution should be taken when adjusting medications especially if working a hazardous job where sudden incapacitation could cause harm to yourself or others.

Further reading:
http://www.cdc.gov/features/DiabetesHeatTravel/
http://www.cdc.gov/diabetes/living/beactive.html
http://www.eatright.org/Public/content.aspx?id=6442477633

Patient Guidance

If possible, increase activities gradually so you can adjust to your body's needs.

Perform regular glucose measurements and know how and when to treat hypoglycemia (low blood glucose).

Consult with your physician if you have hypoglycemic (low blood glucose) readings or feel that your blood glucose is too low to determine if your regimen needs adjusted.

Ensure you have a source of glucose available.

Establish a routine.

Plan meals ahead of time.

Keep healthy snacks available.
Take medications as prescribed.

Hypoglycemia and Safety Sensitive Jobs

Hypoglycemia (low blood glucose) is common among individuals using insulin and oral hypoglycemic, but hypoglycemia severe enough to cause incapacitation is much less common. Safety-sensitive jobs are ones in which incapacitation of the employee could place the employee or others at risk of harm (e.g., firefighters, police officers, locomotive engineers, commercial truck drivers). The main issue with diabetes in a safety sensitive position is the risk he/she will experience a hypoglycemic (low blood glucose) event that interferes with mental or physical functioning while working; hyperglycemia (elevated blood glucose) is unlikely to cause sudden incapacitation.

Patient Guidance

Perform regular glucose measurements and know how and when to treat hypoglycemia (low blood glucose)
Consult with your physician if you have hypoglycemic (low blood glucose) readings or feel that your blood glucose is too low to determine if your regimen needs adjusted
Ensure you have a source of glucose available
Establish a routine
Plan meals ahead of time
Keep healthy snacks available.
Take medications as prescribed.

AMERICAN WITH DISABILITIES ACT

http://www.diabetes.org/living-with-diabetes/know-your-rights/discrimination/employment-discrimination/reasonable-accommodations-in-the-workplace/common-reasonable-accommodations.html

AMERICAN DIABETES ASSOCIATION

http://www.diabetes.org/living-with-diabetes/
http://www.diabetes.org/diabetes-basics/