Diabetes in the Workplace

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Disclosures

I have nothing to disclose
**Learning Objectives**

- Aware of the current prevalence and risk factors for diabetes mellitus
- Discuss the importance of diagnosis, treatment and its complications
- Discuss fitness to drive with diabetes mellitus
- Discuss strategies for accommodating individuals with diabetes in the workplace
- Aware of Workplace Health Programs - Diabetes

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**Clinical Case**

44 yo female patient care assistant c/o bilateral burning / tingling sensation in palms, intermittent, greater on the right.

**Job** – Personal Care Assistant on orthopedic unit – helping patients with ADLs, cleaning rooms

**HPH** – Diabetic, Hypothyroid

**Px**
- BMI 26.56 kg/m2,
- bilateral positive Phalen’s & Tinel’s,
- no weakness,
- no muscle wasting
Diabetes Mellitus

- Prevalence
- Risk Factors
- Prevention
- Diagnosis & Complications
- Treatment
- Fitness to Work
- Accommodation
- Workplace Health Programs

Diabetes – Fast Facts

- 12.3% percent of adults 20 years and older – 2012
  - Diagnosed diabetes (8.9%)
  - Undiagnosed diabetes (3.5%)
- 21.9 Million people have diabetes in the United States.
- 37.3 Million visits (to physician offices, hospital outpatient and emergency departments) with diabetes as primary diagnosis
- 75,578 Deaths
- Deaths per 100,000 population: 23.9
- Cause of death rank: 7

Source: CDC
Number and Percentage of U.S. Population with Diagnosed Diabetes, 1958-2013

Age-adjusted Prevalence of Obesity and Diagnosed Diabetes Among US Adults
NOTES: The components of diabetes may not sum to the total due to rounding. Undiagnosed diabetes is fasting plasma glucose of at least 126 mg/dL, or a hemoglobin A1c of at least 6.5%.

SOURCE: CDC/NCHS, Health, United States, 2014, Figure 6 and Table 44. Data from the National Health and Nutrition Examination Survey (NHANES).
Diabetes – Costs 1

In 2007, the estimated costs of diabetes were:

- $116 billion in medical expenditures
- $58 billion in lost productivity
- $174 billion in total costs

Source: American Diabetes Association (ADA).
"Economic costs of diabetes in the U.S. in 2007".

Diabetes – Costs 2

In 2007, medical costs ($116) attributed to diabetes:

- $27 billion for care to directly treat diabetes,
- $58 billion to treat diabetes-related chronic complications attributable to diabetes,
- $31 billion in excess general medical costs

Source: American Diabetes Association (ADA).
"Economic costs of diabetes in the U.S. in 2007".
Diabetes – Cost 3

In 2007, average medical expenditures:

✦ $11,744 per year
✦ average 2-3 times higher than for persons without diabetes


Diabetes – Costs 4

Indirect costs include:

✦ absenteeism ($2.6 billion),
✦ reduced productivity ($20 billion) for the employed population,
✦ reduced productivity ($0.8 billion) for those not in the labor force,
✦ unemployment for disease-related disability ($7.9 billion), and
✦ lost productive capacity due to early mortality ($26.9 billion)

Diabetes - Disability

- Adults aged 50 and over were followed from 1998 to 2012 in the Health and Retirement Study
  - Self reported activities of daily living
  - Compared lifetime disability related outcomes

- Results (n= 20,008)
  - Died 4.6 years earlier
  - Developed disability 6 – 7 years earlier
  - Spent 1 -2 years in a disabled state
  - With increasing baseline age, reduced number of total and disability-free life years

Source: Bardenheier, Diabetes Care 10.2337/dc15-1095, 2015

Question 1

Which of the following statements is false:

- A. The prevalence of diagnosed diabetes was 8.9%
- B. The prevalence of diagnosed diabetes for 45 – 65 is 11.4%.
- C. Developed disability 1 -2 years earlier.
- D. The total annual cost of diabetes is $174.
Diabetes Mellitus

- Prevalence
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Diabetes – Risk Factors

- Family history of diabetes
- Overweight
- Unhealthy diet
- Physical inactivity
- Increasing age
- High blood pressure
- Ethnicity
- Impaired glucose tolerance (IGT)*
- History of gestational diabetes
- Poor nutrition during pregnancy

Source: International Diabetes Federation
Diabetes – Risk Factors

Prediabetes

■ A person with prediabetes has a blood sugar level higher than normal, but not high enough for a diagnosis of diabetes (estimated to be 57 million).
■ A person is at higher risk for developing type 2 diabetes and other serious health problems, including heart disease, and stroke.
■ Without lifestyle changes to improve their health, 15% to 30% of people with prediabetes will develop type 2 diabetes within five years.


Meta-analysis of shiftwork and diabetes

■ Observational Studies to April 2014
■ OR with 95% CIs for the association between shift work and risk of DM

■ Results
  ■ 12 studies involving 226,652 participants and 14,595 patients with diabetes
  ■ Pooled OR 1.09 (95% CL 1.05 to 1.12, p=0.014)

■ Conclusion
  ■ Shift work is associated with increased risk of diabetes
  ■ Risk was higher among men and rotating shiftwork

Source: Gan Y et al. OEM 2015; 72:72-78.
Diabetes Mellitus

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Diabetes – UCSF Initiative

UCSF Launches Healthy Beverage Initiative
Health Sciences Campus Will Focus Sales on Zero-Calorie and Nutritious Drinks

By Kristen Bole on May 26, 2015
Diabetes – UCSF Healthy Beverage Initiative

- UCSF and its affiliated hospitals are among more than 30 health systems nationwide that have begun to eliminate the sale of sugary beverages on campus in response to the growing evidence of their roles in metabolic and chronic disease, including obesity, diabetes, heart disease, liver disease and dental caries.

“The science behind the impact of excessive sugar on chronic disease, particularly in the form of sweetened beverages, is already strong and growing,” said UCSF Chancellor Sam Hawgood, MBBS. “As a health sciences university and leading medical center, we see it as our responsibility to do our part to help reduce this impact on our own community.”
Diabetes – Question 2

The accepted risk factors for diabetes includes of the following except:

A. Physical inactivity
B. Prediabetes
C. Ethnicity
D. Shiftwork

Diabetes Mellitus

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Diabetes - Diagnosis

- A1C ≥ 6.5%. The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.*

OR

- FPG ≥ 126 mg/dL (7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.*

OR

- 2-h PG ≥ 200 mg/dL (11.1 mmol/L) during an OGTT. The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.*

OR

- In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥ 200 mg/dL (11.1 mmol/L).

*In the absence of unequivocal hyperglycemia, results should be confirmed by repeat testing.

Source: ADA, Diabetes Care 2015;38(Suppl. 1):S8–S16

Diabetes - Types

- Type 1 Diabetes (5%)
  
  - This form of diabetes develops when the cells in the pancreas that produce insulin, known as beta cells, are destroyed.
  
  - This disease can occur at any age, but the peak ages for diagnosis are in the middle teen years.
  
  - To survive, people with type 1 diabetes must have insulin delivered by injection or pump.
**Diabetes - Types**

- **Type 2 Diabetes (90 – 95%)**
  - This form of diabetes is the most common.
  - It usually begins as insulin resistance, a disorder in which cells, primarily within the muscles, liver, and fat tissue, do not use insulin properly.
  - The risk of developing type 2 diabetes is associated with aging, obesity, family history of diabetes, a personal history of gestational diabetes, not being physically active, and race and ethnicity.

- **Gestational Diabetes**
  - This form of diabetes can develop during the second or third trimester of pregnancy.
  - Gestational diabetes increases blood sugar levels and raises the risk of complications for both mother and baby.
  - The risk factors are similar to those for type 2 diabetes, and treatment may include changes in diet or lifestyle or the use of insulin.
**Diabetes - Types**

- **Other Types of Diabetes (1% - 5%)**
  - Other types of diabetes include maturity-onset diabetes of the young or latent autoimmune diabetes in adults.
  - These types of diabetes are caused by specific genetic conditions or from surgery, medications, infections, pancreatic disease, or other illnesses.

**Diabetes - Complications**

- Cardiovascular disease (CAD, stroke)
- Kidney disease (diabetic nephropathy)
- Nerve disease (diabetic neuropathy)
- Eye disease (diabetic retinopathy)
- Pregnancy complications
- Foot damage
- Skin conditions
- Hearing impairment
- Cognitive function
UK Hypoglycemic Study Group

- Type 1 DM
  - Patients with > 15 years duration experienced higher rates of severe hypoglycemia compared with patients with < 5 years

- Type 2 DM
  - Patients with > 5 years was association with increased rates of mild hypoglycemia compared with those with shorter duration of insulin treatment


Diabetes Mellitus

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**Diabetes - Case**

- 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.

- Source: US Equal Employment Opportunity Commission

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**Can a diabetic drive?**

- Increasing prevalence increases the number drivers with DM
- Advances in treatment, medical technology and self-monitoring
- Fitness on a case-by-case basis.
- Active role by maintaining personal health records and accurate blood-glucose monitoring logs.
- Education about avoidance, recognition and appropriate therapeutic intervention for hypoglycemia.
- Evaluate end organ disease separate from hypoglycemic events
Diabetes – Commercial Drivers

Commercial Drivers (operate heavy trucks over long distances) difficulties:

- Maintain a balance between insulin dose, food intake and physical exertion,
- Work long and irregular hours,
- Travel long distances in inclement weather,
- Perform unexpected heavy physical labour, such as the application and removal of tire chains,
- Unable to stop if they become ill while on duty, and
- Mealtimes may be delayed, or missed altogether.

Canadian Medical Association – Determining Medical Fitness to Drive

- **Guidelines on initial application for a commercial licence**
  - An assessment by an internist or specialist in diabetes
  - Medical records for the preceding 24 months.
  - Attendance at a diabetes education program.
  - A full eye examination by an ophthalmologist or optometrist.
  - A HbA1C test within the past three months.
  - A log of blood-glucose measurements performed at least twice daily in the last six months. A downloaded log from a memory-equipped glucose meter is preferred.
**Federal Motor Carrier Safety Administration**

- Diabetes
  - Diet
  - Medication
  - Insulin

- Federal Exemption Program (49 CFR 390.5)
  - 5-year history
  - Endocrinologist opinion
  - Vision Optometrist or Ophthalmologist

- Source: Federal Motor Carrier Safety Administration

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**Road Traffic Accident Risk (FMCSA)**

- Prospective follow up Norwegian Study
  - Counted the number of accidents in DM patients receiving insulin or glucose lowering drugs
  - Exposure was person-years measuring time from onset of treatment to accident
  - Comparator group was patients who started peptic ulcer medication

- Results:
  - SIR (95% confidence interval) for all ages and both genders combined were: insulin 1.4 (1.2–1.6), oral glucose-lowering agents 1.2 (1.0–1.3)

Skurvet et al. Diabetic Medicine 2009;26:404-408
Regulated Mariners Examinations

Diabetes Mellitus requiring Insulin or history of diabetic ketoacidosis

- Internal Medicine consultation documenting interval history, blood pressure and weight, evaluation of fasting plasma glucose; and, two current HbA1C’s (<8.0) separated by at least 90 days, the most recent no more than 90 days old, ophthalmology consultation, graded exercise test.

- Source: US Coast Guard, NVIC 04-08, 2008.

Federal Aviation Authority

- Disease Protocols - Insulin Treated Diabetes Mellitus - Type I or Type II (Initial Certification)
  - No recurrent (two or more) episodes of hypoglycemia in the past 5 years and none in the preceding 1 year
  - All medical records as well as accident and incident records pertinent to their history of diabetes.
  - A medical examination by a physician who specializes in the treatment of diabetes will be required. The report:
    - Two HbA1C separated by at least 90 days. The most recent measurement must be no more than 90 days old.
    - Specific reference to the applicant’s insulin dosages and diet.
    - Specific reference to the presence or absence of cerebrovascular, cardiovascular, or peripheral vascular disease or neuropathy.
    - Confirmation by an eye specialist of the absence of clinically significant eye disease.
Federal Aviation Authority

- Initial certification cont...
  - verification that the applicant has been educated in diabetes
  - understands the actions that should be taken if complications, especially hypoglycemia, should arise.
  - verify that the applicant has the ability and willingness to properly monitor and manage his or her diabetes.
  - If the applicant is age 40 or older, a report, with ECG tracings, of a maximal graded exercise stress test.
  - The applicant shall submit a statement from his/her treating physician, examiner, or other knowledgeable person attesting to the applicant’s dexterity and ability to determine blood glucose levels using a recording glucometer.

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Is Diabetes a Disability?

- Specifically, federal laws, such as the Americans with Disabilities Act and the Rehabilitation Act, protect qualified individuals with a disability.

- Since 2009, amendments and regulations for these laws make clear that diabetes is a disability since it substantially limits the function of the endocrine system. This internal limitation is enough—no outside limitation is necessary. This means diabetes can be an "invisible" disability.

Source: American Diabetic Association

Diabetes in Federal Law

- Federal law does not take into account mitigating measures such as medication use when determining whether an individual is a qualifying person with a disability.

- A person may have diabetes completely under control through medicine and lifestyle changes, and still have a qualifying disability.

- That means that for the purpose of defining disability, the laws look at how the person would be if they stopped treating diabetes in any way. Usually, that would be very bad. As a result, diabetes is almost always a disability.

Source: American Diabetic Association
Diabetes – Federal Law

Summary,

◆ Diabetes is a disability because it substantially limits the function of the endocrine system
◆ Diabetes can be an "invisible" disability
◆ Diabetes is still a disability, even if a person is healthy and diabetes is well-managed

Source: American Diabetic Association

When to Accommodate?

■ To the point of undue hardship
■ Qualified for the job
■ Equivalent pay and status
■ Need not be a promotion unless competes for the job
■ Place to administer insulin
■ Ability to sit if standing not required
■ Redistributing marginal tasks to another employee
Diabetes – How to Accommodate

- What are the limitations of function?
- How do these limitations affect the work?
- What job tasks are problematic?
- What accommodations are available?
- Are there other possible accommodations?
- Has the employee been consulted?
- Is training required?
- Review the effectiveness of accommodations?

Diabetes - Accommodation

Hypo/Hyperglycemia:
- Allow for storage of medications, such as insulin or food
- Provide an area to test blood sugar levels
- Provide an area to administer medications (insulin)
- Provide appropriate containers for needles/syringe disposal
- Provide a rest area for reorientation after hypo/hyperglycemic episode
- Allow frequent breaks for food as needed
- Provide appropriate food for office sponsored events and reward programs
- Consider modifications to policies involving food storage and consumption
Diabetes - Accommodation

Neuropathy (Nerve damage):
- Modify job tasks requiring fine finger dexterity
- Provide protective clothing and equipment
- Eliminate or reduce the need to use sharp objects
- Provide anti-fatigue mats or padded carpeting
- Allow flexibility to sit or stand
- Provide parking accommodations

Diabetes - Accommodation

Fatigue or Weakness:
- Allow frequent rest breaks
- Reduce or eliminate strenuous activities
- Provide anti-fatigue mats or padded carpeting
- Provide a rest area with cot
- Allow flexibility to sit or stand
- Allow job sharing
- Shorten work day and extend work week
Diabetes - Accommodation

Vision Impairment:
- Magnification: consider external magnification devices or computer screen magnification software
- No benefit from magnification, consider Braille, tactile graphics, or assistive technology (e.g., screen reading software)
- Blurriness or haziness use of high contrast settings and themes may be helpful
- Provide a digital voice recorder or provide a qualified reader
- Allow flexible schedule to use public transportation to and from work
- Allow use of service animal for assistance with vision and/or mobility
- Photosensitivity, consider alternative lighting such as lamps or fluorescent light filters

Diabetes - Accommodation

Kidney Disease:
- Provide easy access to restroom facilities
- Allow a flexible schedule or time off for treatment (dialysis)
- Some individuals may be able to telework from the dialysis site
Diabetes - Accommodation

Cognitive Limitations:
- Provide written job instructions and prioritize assignments
- Increase job structure
- Use of day planner or electronic organizer
- Provide flexible work hours
- Provide reminders
- Minimize distractions

Diabetes - Accommodation

Other Considerations:
- Provide area to brush teeth to prevent periodontal gum disease
- Evaluate safety hazards
- Avoid temperature extremes to help deal with poor circulation
- Educate coworkers on emergency situation procedures and identification of symptoms of hypoglycemia or hyperglycemia
Diabetes - Accommodation

Psychological Limitations:
- Reduce stress
- Allow time off for counseling or therapy

Diabetes – Question 3
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.

Which statement is false? The hotel can accommodate the request because:

A. It is not undue hardship to reassign her.
B. The housekeeper is qualified for the position.
C. The position is a decrease in pay and status.
D. The employee can perform the essential functions.
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Diabetes – Worksite Wellness

- Web survey – companies in mid atlantic region
  - 162 companies: > 500 (38%); < 100 (37%)
- Programs offered
  - Weight Management – 46.30%
  - Tobacco Cessation – 45.38%
  - Stress Management – 32.72%
  - Nutrition Counselling – 33.33%
- Other questions
  - Health selection (vending machines) – 49.24%
  - Use of stairs encouraged – 60.16%
  - Biometric screening – 42.50%
  - Healthy meeting policy – 14.29%

Workplace health programs:

- A coordinated and comprehensive set of strategies which include programs, policies, benefits, environmental supports, and links to the surrounding community designed to meet the health and safety needs of all employees.

- Refer to a coordinated and comprehensive set of strategies which include programs, policies, benefits, environmental supports, and links to the surrounding community designed to meet the health and safety needs of all employees.

- Health education classes
- Access to local fitness facilities
- Company policies that promote healthy behaviors such as a tobacco-free campus policy
- Employee health insurance coverage for appropriate preventive screenings
- A healthy work environment created through actions such as making healthy foods available and accessible through vending machines or cafeterias
- A work environment free of recognized health and safety threats with a means to identify and address new problems as they arise
Clinical Case

44 yo female patient care assistant c/o bilateral burning / tingling sensation in palms, intermittent, greater on the right.

Job Tasks – helping patients with ADLs, cleaning rooms

Px – BMI 26.56 kg/m², bilateral positive Phalen’s & Tinel’s, no weakness, no muscle waisting

EMG – Severe bilateral carpal tunnel syndrome
Case...

Hgb A1C  – 9.4% 10/26/14
- 8.7% 9/28/15
- 8.2% 10/17/15

TSH   – 5.05 (.45-4.12) mIU/L
- 3.65 mIU/L

Case...

Treatment
- Control of diabetes
- Carpal tunnel release
In summary

- Prevalence of Diabetes – increasing, affecting over 20 million, costing over $178 Billion
- Controllable risk factors are weight, diet, activity
- Shiftwork may be a risk factor
- Hypoglycemia requires review in the workplace
- Fitness to work requires individual consideration, may be difficult for an insulin dependent diabetic
- Complications of diabetes are handled separately from a fitness to work
- Accommodation for diabetes can be broad, follows ADA
- Continues to be a focus in the renewed interest for Healthy Workplace Programs

Q’s & A’s