Type 2 Diabetes

Lecture Objectives

- Examine the physiology of type 2 diabetes.
- Describe the epidemiology of type 2 diabetes and compare it to that of obesity.
- Describe the prevention and treatment of type 2 diabetes.
Type 2 Diabetes - How it Works

- Cells develop insulin resistance, meaning that cells need increasing doses of insulin to absorb and use glucose.

- When glucose builds up in the blood instead of going into the cells, it can cause two problems
  - 1) Right away your cells may be starved for energy
  - 2) Overtime high blood glucose may hurt your kidneys, eyes, nerves or heart

Diabetes

FAST FACTS ON DIABETES

*Diabetes affects 25.8 million people 8.3% of the U.S. population*

**DIAGNOSED**
18.8 million people

**UNDIAGNOSED**
7.0 million people

12.6 million, or 10.8% of all women aged 20 years or older have diabetes
Age-Adjusted Prevalence of Diagnosed Diabetes Among U.S. Adults

1994

2000

2010

Age-Adjusted Percentage of Civilian, Noninstitutionalized Population with Diagnosed Diabetes, by Sex, United States, 1980–2011

From 1980 to 1998, the age-adjusted percentage of people with diagnosed diabetes was similar for men and women. However, in 1999, the percentage for males began to increase at a faster rate than that of females. From 1980 to 2011, the age-adjusted percentage of diagnosed diabetes increased 156% (from 2.7% to 6.9%) for males and 103% (from 2.9% to 5.9%) for females.
Risk Factors for Diabetes

- Having a first-degree relative with diabetes
- Being overweight (BMI > 25)
- Having hypertension, abnormal high-density lipoprotein (HDL) or triglyceride levels
- Racial groups: African American, Hispanics, American Indians/Alaskan Natives
- Gestational diabetes*
Symptoms of Diabetes

- Frequent urination
- Unusual thirst
- Weight loss
- Blurred vision
- Feelings of fatigue or illness
- Frequent infections
- Slow healing of sores

Diagnosis of Diabetes

- Fasting plasma glucose test or
- Oral glucose tolerance test (“gold standard”)

- Normal sugar level = 70–110 mg/DL; blood sugar level above 126 mg/dL on at least two occasions
### Table 11.6 Complications of Diabetes

- Heart disease, including peripheral vascular disease, coronary heart disease, and cardiac failure
- Stroke
- High blood pressure
- Retinopathy (broken blood vessels in retina)/blindness
- End-stage renal disease (kidney failure)
- Damage of the nervous system
- Lower-extremity amputations
- Periodontal disease
- Congenital malformations/spontaneous abortions
- Neonatal mortality
- Macrosomia (large-birthweight babies)
- Diabetic ketoacidosis (coma)
- Susceptibility to infections and illness, such as pneumonia

### Treatment & Monitoring

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Monitoring</th>
</tr>
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<tbody>
<tr>
<td>Diet control</td>
<td><strong>Hyperglycemia</strong>: emergency situation</td>
</tr>
<tr>
<td>Exercise</td>
<td><strong>Hypoglycemia</strong>: food or drink with sugar in it</td>
</tr>
<tr>
<td>Blood glucose testing</td>
<td></td>
</tr>
<tr>
<td>Oral medications or insulin</td>
<td></td>
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Cost of Diabetes

- **$245 billion**: total costs of diagnosed diabetes in the United States in 2012
  - $176 billion for direct medical costs
  - $69 billion in reduced productivity

- Average medical expenditures among people with diagnosed diabetes were **2.3 times** higher than what expenditures would be in the absence of diabetes.

Lecture Wrap Up

- **Key Terms:**
  - Type 2 Diabetes, Hyperglycemia, Hypoglycemia, Glucose, Insulin

- **Individual Health Importance:**
  - Understand the key components of living a healthy lifestyle, which can impact risk for diabetes later in life.

- **Public Health Importance:**
  - Diabetes is a prevalent condition among women.

- **Social/Political Importance:**
  - Sociocultural, behavioral, and environmental factors influence risk for diabetes.