TYPE I DIABETES
K Eckert, MD
Type I Diabetes

- Prevalence – 0.2-0.5%
- Incidence rising
- Peak ages: 3-6 yrs and teens, but may present up to 40 yrs of age
Type I Diabetes

- Pathophysiology
  - Genetics
  - Autoimmune
  - Environmental
Type I Diabetes

- Diagnosis
  - Excessive thirst and urination
  - **Weight loss**
  - Fatigue, blurry vision, behavioral changes
  - Vomiting, CNS changes, coma
Type I Diabetes

- Hospitalization
  - Rapid normalization of blood sugars
  - Rapid weight gain to normal premorbid weight
- Education
  - Parents/significant others as well as patient involved
Type I Diabetes

- **Insulin**
  - **Long acting insulins:**
    - Lantus/Levemir
    - Takes care of basal needs, internal glucose production
  - **Short acting insulins:**
    - Humalog/Novolog
    - Takes care of food, illness, high blood sugars
  - **Insulin pump**
    - Continuous infusion of short acting insulin with basal and bolus functions
Type I Diabetes

- Food Management
  - Carbohydrate counting
  - Matching energy and growth needs with food
  - Optimal insulin dosing to utilize calories
  - Gluten free diet
Type I Diabetes

- Comorbidities/complications
  - Hypothyroidism/hyperthyroidism
  - Adrenal insufficiency
  - Celiac disease
  - Complications including retinopathy, proteinuria, vascular disease
Type I Diabetes

- Monitoring
  - Multiple insulin injections each day (4-6)
  - Multiple fingerstick blood sugars (4-8)
  - Hemoglobin A1c (3 month average blood sugar)
  - Screening for complications/comorbidities: urine, lipids, kidney function, eye exam, other endocrine labs
<table>
<thead>
<tr>
<th>HbA1c</th>
<th>Average blood level (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 %</td>
<td>70</td>
</tr>
<tr>
<td>5 %</td>
<td>100</td>
</tr>
<tr>
<td>6 %</td>
<td>135</td>
</tr>
<tr>
<td>7 %</td>
<td>170</td>
</tr>
<tr>
<td>8 %</td>
<td>205</td>
</tr>
<tr>
<td>9 %</td>
<td>240</td>
</tr>
<tr>
<td>10 %</td>
<td>275</td>
</tr>
<tr>
<td>11 %</td>
<td>310</td>
</tr>
<tr>
<td>12 %</td>
<td>345</td>
</tr>
<tr>
<td>13 %</td>
<td>380</td>
</tr>
</tbody>
</table>

- **Normal HbA1c is 4-6 percent.**
- **HbA1c of 6.5 percent or less is goal for diabetes.**
Type I Diabetes

- **Basic Science**
  - Hyperglycemia and potassium
    - Acidosis perpetuates K loss
    - Diuresis further loss
  - Renal Threshold
    - >180 mg/dL results in glucosuria
  - Lethal pH
  - WBC in DKA
  - Thirst mechanism
Type I Diabetes

- Clinical Science
  - Typical presentation
  - Trigger mechanisms for DM
  - Insulin use (sliding scale, other)
  - Dehydration leads to N/V
  - Purpose and timing of insulin in DKA
Psychosocial/Ethical
- Adherence issues
- Follow up care
- Lifestyle changes
- Eating disorders
- Outcome data
- Genetic testing