Update in Diabetes Management & Supporting Nutritional Change

37th Annual NCCRA Symposium

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Doris Welborn, MED, RD, LDN, CDE, CPT
“The dietician said he should watch what he eats!”

© 2008 Diabetes Health
Learning Objectives

- Basics
- New Diagnosis criteria
- Medications
- Carbohydrate counting
- Latest apps
- Technology
- Resources
Liver releases glucose between meals & at night. Surges between 2-4 AM called the “Dawn Phenomenon.”

Pancreas releases insulin constantly then at meals insulin releases more to cover food.
Pancreas
Types of Diabetes

**Type 1 Diabetes**
- Beta cell destruction/ autoimmune
- 5-10% population
- Mostly occurs at younger age
- Requires: Insulin to survive

**Type 2 Diabetes**
- More insulin resistance & / or insulin production
- 90-95% population
- Older > 50
- Sedentary lifestyle
- Overweight BMI > 30
- Genetics: Indians/Hispanics/African Americans/Asians
- Requires: Lifestyle change, Medication/insulin
Glucose goes through every blood vessel & touches every area in the body

Diabetic Retinopathy
Leading cause of blindness in adults\textsuperscript{1,2}

Diabetic Nephropathy
Leading cause of end-stage renal disease\textsuperscript{3,4}

Stroke
2-to 4-fold increase in cardiovascular mortality and stroke\textsuperscript{5}

8/10 individuals with diabetes die from CV events\textsuperscript{6}

DIABETES MELLITUS
Complications resulting from diabetes

* Diabetes is the seventh leading cause of death in the U.S.
* Adults with diabetes are 2-4 times more likely to suffer from heart disease or stroke.
* Diabetes is the leading cause of kidney failure, non-traumatic lower-limb amputations, and new cases of blindness in adults.
* Other complications include periodontal disease, high blood pressure, diabetic retinopathy, neuropathy & high risk pregnancy.
Complications from Diabetes

Diabetic Peripheral Neuropathy

Healthy Nerves and Blood Vessels

Nerves and Blood Vessels Damaged by DPN

Insufficient blood flow to the heart muscle from narrowing of coronary artery may cause chest pain.


Diabetes Affects the Kidney

Normal Kidney

Diabetic Kidney

Ulcer

Normal skin

Ulceration

Medscape
Ethnicity of Diagnosed Diabetes

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indians/Alaskan Natives</td>
<td>15.9%</td>
</tr>
<tr>
<td>non-Hispanic blacks</td>
<td>13.2%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>12.8%</td>
</tr>
<tr>
<td>Asian Americans</td>
<td>9.0%</td>
</tr>
<tr>
<td>non-Hispanic whites</td>
<td>7.6%</td>
</tr>
</tbody>
</table>
**ADA Diagnosis: Diabetes**

<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C*</td>
<td>≥ 6.5%</td>
</tr>
<tr>
<td>FBG**</td>
<td>≥ 126 on 2 occasions</td>
</tr>
<tr>
<td>Random BG</td>
<td>≥ 200 with symptoms</td>
</tr>
<tr>
<td>OGTC (75 gm) (Oral Glucose Tolerance Test)</td>
<td>≥ 200</td>
</tr>
</tbody>
</table>

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

**Fasting blood glucose non-caloric intake at least 8 hours

**CDC:** 29.1 million Americans have diabetes- (48% are uncontrolled). 8.1 million have undiagnosed diabetes (27.8%)
A1C = estimated Average Glucose level
### ADA Diagnosis: Pre-Diabetes

<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C</td>
<td>5.7% - 6.4%</td>
</tr>
<tr>
<td>Fasting Blood Glucose</td>
<td>100-125 mg/dl</td>
</tr>
<tr>
<td>2-hr PG (Postprandial Glucose)</td>
<td>140-199 mg/dl</td>
</tr>
<tr>
<td>75 gram OGTT</td>
<td>140-199 mg/dl</td>
</tr>
</tbody>
</table>

**CDC 2012**: 86 million Americans walking around not knowing they have it
## ADA Diabetes Standards of Care 2015 & 2016

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Meal Blood Glucose</td>
<td>70-130 mg/dl</td>
<td>80-130 mg/dl</td>
</tr>
<tr>
<td>Blood pressure:</td>
<td>130/80 mm/Hg</td>
<td>140/90 mm/Hg</td>
</tr>
<tr>
<td>A1C children &amp; adolescents</td>
<td>Age based</td>
<td>&lt; 7.5%</td>
</tr>
<tr>
<td>BMI overweight</td>
<td>&gt;25 kg/m</td>
<td>&gt;25 kg/m &amp; &gt; 23 kg/m Asian Americans</td>
</tr>
</tbody>
</table>
Symptoms of Hyperglycemia

- Increased thirst
- Frequent urination
- Extreme hunger
- Fatigue
- Weight loss
- Slowly-healing sores
- Dry and scratchy skin
- Numbness or tingling in the feet
- Blurry vision
Causes of Hyperglycemia

- Eating too much
- Sickness / Infections
- Stress
- Skipping or not taking enough diabetes medication
- Not getting regular physical activity or exercise

Action Steps for Hyperglycemia

Check blood sugar more often

- Drink plenty of water
- Follow your meal plan
- Ask why?
- Look for patterns or trends
- Call your doctor if blood sugar levels remain elevated
Symptoms of Hypoglycemia

Low Blood Sugar Symptoms

- Shaking
- Sweating
- Anxious
- Dizziness
- Hunger
- Fast heartbeat
- Impaired vision
- Weakness
- Fatigue
- Headache
- Irritable

Hormone response to low’s

- Insulin
- Epinephrine
- Cortisol
- Glucagon
- Growth hormone
- Hepatic glucose output
- Insulin sensitivity
- Protein breakdown
- Lipid utilization
- Ketones
- Gluconeogenesis
- Glucose
Treatment of Hypoglycemia

15/15 Rule

15/15 Rule: Check blood sugar, if ≤ 70 eat 15 grams carbohydrate
Recheck in 15 minutes if blood sugar not up, eat 15 grams carbs again.

15 grams carbohydrate include:

- 3 – 4 Glucose tablets
- 6 or 7 hard candies (not sugar free)
- 1 Tbsp. honey or corn syrup
- ½ cup (4 oz.) of juice
- ½ cup of regular soda

If you are unable to raise blood sugar above 70 and/or experiencing severe low blood sugar symptoms
Call your doctor or 911.
Medications target different areas in the body.
Sodium Glucose Transmitter 2: (Lowers Renal Threshold)
- All glucose is squeezed through the kidneys
- Kidney handles up to 180 mg/dl reabsorbs glucose. (250 mg/dl diabetes)
- High glucose levels excreted out the urine.
- Lower renal threshold excretes more glucose.
- Have seen some positive weight loss. Excreting calories with the excess glucose.

Note: Half life of 11-21 hours/ takes up to 65 hours to clear system- important to keep in mind. Sodium & potassium exchanges are affect- tends to lose sodium- has known to lower blood pressure.
# Oral Diabetes Medications

## Biguanides
- Decrease hepatic glucose output
- First line med at diagnosis of type 2 diabetes

<table>
<thead>
<tr>
<th>Name(s)</th>
<th>Daily Dose Range</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>metformin (Glucophage)</td>
<td>500 – 2500 mg (usually BID w/meal)</td>
<td>Side effects: nausea, bloating, diarrhea. Use XR to minimize. Lactic acidosis precaution: avoid in pts w/creatinine &gt; 1.4 mg/dL. 1.5 men, 1.6 women during illness or surgery. Benefits: decreased cholesterol, no wt gain or hypoglycemia. Lowers A1c 1.0% – 2.0%.</td>
</tr>
<tr>
<td>Extended Release-XR (Glucophage XR) (Glumetza) (Fortamet)</td>
<td>(1x daily w/dinner) 500 – 2000 mg 500 – 2000 mg 500 – 2500 mg</td>
<td></td>
</tr>
</tbody>
</table>

## Sulfonylureas
- Stimulates sustained insulin release

<table>
<thead>
<tr>
<th>Name(s)</th>
<th>Daily Dose Range</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>glyburide: (Micronase, Diabeta) (Glynase)</td>
<td>1.25 – 20 mg 0.75 – 12 mg</td>
<td>Can take once or twice daily before meals. Side effects include hypoglycemia and weight gain. Eliminated via kidney. Caution: Glyburide most likely to cause hypoglycemia. Lowers A1c 1.0% – 2.0%.</td>
</tr>
<tr>
<td>glipizide: (Glucotrol) (Glucotrol XL)</td>
<td>2.5 – 40 mg 2.5 – 20 mg</td>
<td></td>
</tr>
<tr>
<td>glimepiride (Amaryl)</td>
<td>1.0 – 8 mg</td>
<td></td>
</tr>
</tbody>
</table>

## DPP – 4 Inhibitors
- "Incretin Enhancers"
- Prolongs action of gut hormones
- Increases insulin secretion
- Delays gastric emptying

<table>
<thead>
<tr>
<th>Name(s)</th>
<th>Daily Dose Range</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>sitagliptin (Januvia)</td>
<td>100 mg daily (eliminated via kidney*)</td>
<td>If creatinine elevated, see pkg insert for dosing info. No wt gain or hypoglycemia. Side effects include nasopharyngitis, headache and upper-respiratory tract infection. Report signs of pancreatitis (abdominal pain, nausea, vomiting). Lowers A1c 0.6% – 0.8%.</td>
</tr>
<tr>
<td>saxagliptin (Onglyza)</td>
<td>Up to 5 mg daily (eliminated via kidney*, feces)</td>
<td></td>
</tr>
<tr>
<td>linagliptin (Tradjenta)</td>
<td>5 mg daily (eliminated via feces)</td>
<td></td>
</tr>
<tr>
<td>alogliptin (Nesina)</td>
<td>25 mg once daily (eliminated via kidney)</td>
<td></td>
</tr>
</tbody>
</table>

More medications on back. Note: These meds are for people with Type 2 diabetes and should not be used during pregnancy. Content is for educational purposes only: please consult prescribing information for details.
<table>
<thead>
<tr>
<th>Class/Main Action</th>
<th>Name(s)</th>
<th>Daily Dose Range</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGLT2 Inhibitors</td>
<td>Canagliflozin (Invokana)</td>
<td>100 – 300 mg 1x daily</td>
<td>For all, monitor B/P, K+ and renal function. If GFR&lt;45, stop Invokana. If GFR&lt;60, stop Farxiga. Do not start pts w/ GFR&lt;45 on Jardiance. Side effects: hypotension, UTIs, increased urination, genital infections. Avoid Farxiga in pts w/ bladder cancer. Lowers A1c 0.7% – 1.5%, lowers wt 1 – 3 lbs.</td>
</tr>
<tr>
<td></td>
<td>Dapagliflozin (Farxiga)</td>
<td>5 – 10 mg 1x daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Empagliflozin (Jardiance)</td>
<td>10 – 25 mg 1x daily</td>
<td></td>
</tr>
<tr>
<td>Thiazolidinediones “TZDs”</td>
<td>Pioglitazone (Actos)</td>
<td>15 – 45 mg daily</td>
<td>Black Box Warning: TZDs may cause or worsen CHF. Monitor for edema and weight gain. Increased peripheral fracture risk. Actos may increase risk of bladder cancer. Lowers A1c 0.5% – 1.0%.</td>
</tr>
<tr>
<td></td>
<td>Rosiglitazone (Avandia)</td>
<td>4 – 8 mg daily</td>
<td></td>
</tr>
<tr>
<td>Glucosidase Inhibitors</td>
<td>Acarbose (Precose)</td>
<td>25 – 100 mg w/meals; 300 mg max daily dose</td>
<td>Start low dose, increase at 4-8 wk intervals to decrease GI effects. Caution with liver or kidney problems. In case of hypo, treat w/ glucose tabs. Lowers A1c 0.5% – 1.0%.</td>
</tr>
<tr>
<td></td>
<td>Miglitol (Glyset)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dopamine Receptor Agonists</td>
<td>Bromocriptine mesylate—Quick Release “QR” (Cyostil)</td>
<td>1.6 to 4.8 mg a day (each tab 0.8 mg)</td>
<td>Take within 2 hrs of waking. Side effects: nausea, headache, fatigue, hypotension, syncope, somnolence. Lowers A1c 0.6% – 0.9%.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meglitinides</td>
<td>Repaglinide (Prandin)</td>
<td>0.5 – 4 mg w/meals (metabolized in liver)</td>
<td>Take before meals. Side effects may include hypoglycemia and weight gain. Lowers A1c 1.0% – 2.0%.</td>
</tr>
<tr>
<td></td>
<td>Nateglinide (Starlix)</td>
<td>60 – 120 mg w/meals (eliminated via kidney)</td>
<td></td>
</tr>
<tr>
<td>Insulins Available in the United States</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Generic Name (U-100, except where noted)</strong></td>
<td><strong>Brand Name</strong></td>
<td><strong>Manufacturer</strong></td>
<td><strong>Form</strong></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------</td>
</tr>
<tr>
<td>Regular insulin aspart</td>
<td>NovoLog</td>
<td>Novo Nordisk</td>
<td>analog</td>
</tr>
<tr>
<td>Regular insulin human</td>
<td>Afrezza</td>
<td>Sanofi</td>
<td>human</td>
</tr>
<tr>
<td>Regular insulin glulisine</td>
<td>Apadra</td>
<td>Sanofi</td>
<td>analog</td>
</tr>
<tr>
<td>Regular insulin lispro</td>
<td>Humalog*</td>
<td>Eli Lilly</td>
<td>analog</td>
</tr>
<tr>
<td><strong>Regular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular humulin R</td>
<td></td>
<td>Eli Lilly</td>
<td>human</td>
</tr>
<tr>
<td>Regular Novolin R</td>
<td>Novo Nordisk</td>
<td>Human</td>
<td>syringe</td>
</tr>
<tr>
<td><strong>NPH</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humulin N</td>
<td></td>
<td>Eli Lilly</td>
<td>human</td>
</tr>
<tr>
<td>Novolin N, Renin (Walmart)</td>
<td>Novo Nordisk</td>
<td>Human</td>
<td>syringe</td>
</tr>
<tr>
<td><strong>Rapitard</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lente</td>
<td>Leveimir</td>
<td>Novo Nordisk</td>
<td>analog</td>
</tr>
<tr>
<td>Insulin glargine</td>
<td>Lantus</td>
<td>Sanofi</td>
<td>analog</td>
</tr>
<tr>
<td><strong>Ultra-Lente Acting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulin glargine U-300</td>
<td>Toujeo</td>
<td>Sanofi</td>
<td>analog</td>
</tr>
<tr>
<td><strong>Mixtures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% lispro protamine/50% insulin lispro</td>
<td>Humalog Mix 50/50</td>
<td>Eli Lilly</td>
<td>analog</td>
</tr>
<tr>
<td>75% lispro protamine/25% insulin lispro</td>
<td>Humalog Mix 75/25</td>
<td>Eli Lilly</td>
<td>analog</td>
</tr>
<tr>
<td>25% aspart protamine/75% insulin lispro</td>
<td>Humalog Mix 25/75</td>
<td>Novo Nordisk</td>
<td>analog</td>
</tr>
<tr>
<td>75% aspart/25% regular</td>
<td>Humulin 75/25</td>
<td>Eli Lilly</td>
<td>human</td>
</tr>
<tr>
<td>25% aspart/75% regular</td>
<td>Humulin 25/75</td>
<td>Novo Nordisk</td>
<td>human</td>
</tr>
<tr>
<td><strong>Long-Acting Insulins</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular U-500</td>
<td>Humulin R U-500</td>
<td>Eli Lilly</td>
<td>human</td>
</tr>
<tr>
<td>Insulin lispro U-200</td>
<td>Humalog U-200</td>
<td>Eli Lilly</td>
<td>analog</td>
</tr>
</tbody>
</table>

**Key**
- *Note difference between Humalog and Humulin U-200.
- Note difference between Humulin R and Humulin R U-500.
- Note difference between Novolin 70/30 (70% NPH/30% Regular) and NovoLog Mix 70/30 (25% aspart protamine/75% insulin lispro).
- U-100, U-200, U-300, and U-500 are different concentrations of insulin. Higher concentrations are typically used in very insulin-resistant people.

ADA website: diabetes.org
Figure 10.2 Basal-bolus insulin regimen.
Things to consider

- Build a rapport with patient
- Listen, be non-judgmental
- Ask open-ended questions.
  - “Tell me what a typical day would be with your eating pattern”
- Use empowerment model / (patient centered care)
- Ask them to pick one goal or something they can start working on.
- Ask what is the most important thing they would like to learn?
- Rate readiness / Scale: 1-10
  - (Where are they located on the scale)
- If not ready, defer education- document not receptive.
## Basic Nutrition

### Calories Nutrients

- **Carbohydrates:** Energy to cells
- **Protein:** Building Blocks - Muscle repair
- **Fat:** Stored energy

### Non-calorie nutrients

- **Vitamins:** A, B, C, D, E, K
  - Fat soluble: A, D, E, K
  - Water soluble: B’s & C
- **Minerals:**
  - **Macro minerals:** calcium, phosphorus, magnesium
    - sodium, potassium, chloride and sulfur
  - **Trace minerals:** iron, manganese, copper, iodine, zinc, cobalt, fluoride and selenium
- **Water**
Nutrition and Diabetes

* Basic Meal Planning for Healthy Nutrition
  - Eat 3 balanced meals a day (include protein, carbohydrate and fat)
  - Watch your portion sizes
  - Eat at the same time each day
  - Eat meals 4 – 5 hours apart
  - Eat less sugar and sweets
  - Eat less fat and fried foods
  - Limit salt intake
### Portion Examples

<table>
<thead>
<tr>
<th>1 cup</th>
<th>2 Tbsp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>= a fist</td>
<td>= ping pong ball</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3 oz. meat</th>
<th>1 medium potato</th>
</tr>
</thead>
<tbody>
<tr>
<td>= deck of cards</td>
<td>= computer mouse</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 fruit serving</th>
<th>1 Tbsp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>= tennis ball</td>
<td>= thumb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 oz. cheese</th>
<th>1 tsp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 4 dice</td>
<td>= tip of thumb</td>
</tr>
</tbody>
</table>
Top challenges for diabetics

**Sweet beverages**

- What are you drinking?
- Water: add lemon, oranges, cucumbers to natural flavor.
- Flavored water with zero carbs
- Packets of unsweetened flavors
- Sweeteners: saccharin, sucralose, aspartame, stevia or unsweetened

**Portions**

- Use smaller plate 8-9” vs 12”/ portion plates
- Measure portions/ put on plate
- Start with the portions you are eating & slowly cut down on the amount
- Be mindful of what you’re eating
- Logging your food helps lose weight!
- Increase fruits & non-starchy vegetables
Carbohydrate Counting

Three ways to teach it:

1. Count the grams
2. Count the servings
3. Use the plate method for visualization
### Carbohydrate counting

<table>
<thead>
<tr>
<th>15 grams = one carbohydrate serving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starches</td>
</tr>
<tr>
<td>Fruits</td>
</tr>
<tr>
<td>Milk/Yogurt</td>
</tr>
<tr>
<td>Sweets/Desserts</td>
</tr>
</tbody>
</table>

**ADA carbohydrate guidelines**

**Per Meal**

- **Women**: 3-4 servings (45-60 grams) carbs
- **Men**: 4-5 servings (60-75 grams) carbs

**Snacks**

1-2 servings (15-30 grams) carbs
Carbohydrate Counting Using a Food Label

### Nutrition Facts

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories</th>
<th>Calories from Fat</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Fat</td>
<td>8g</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1g</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0mg</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>160mg</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>37g</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>4g</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Sugars</td>
<td>1g</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>3g</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

| vitamin A          | 10%      |                   |                |
| vitamin C          | 8%       |                   |                |
| Calcium            | 20%      |                   |                |
| Iron               | 45%      |                   |                |

*Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Calories per 2/3 cup</th>
<th>230 Calories</th>
</tr>
</thead>
</table>

### Current label

1. **Serving size**

2. **Total carb amount**

### Proposed label

- **Serving size**: 2/3 cup (55g)
- **Servings per container**: About 8

<table>
<thead>
<tr>
<th>Amount per 2/3 cup</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>230</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>%DV*</th>
<th>Total Fat</th>
<th>Saturated Fat</th>
<th>Trans Fat</th>
<th>Cholesterol</th>
<th>Sodium</th>
<th>Total Carbohydrate</th>
<th>Dietary Fiber</th>
<th>Sugars</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%</td>
<td>8g</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
<td>7%</td>
<td>12%</td>
<td>37g</td>
<td>1g</td>
<td>10%</td>
</tr>
<tr>
<td>5%</td>
<td>1g</td>
<td></td>
<td></td>
<td>0%</td>
<td>7%</td>
<td></td>
<td>4g</td>
<td>0g</td>
<td>20%</td>
</tr>
<tr>
<td>0%</td>
<td>0g</td>
<td></td>
<td></td>
<td>0%</td>
<td>7%</td>
<td></td>
<td>1g</td>
<td>1g</td>
<td>45%</td>
</tr>
<tr>
<td>12%</td>
<td>37g</td>
<td></td>
<td></td>
<td>14%</td>
<td>12%</td>
<td></td>
<td>37g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14%</td>
<td>4g</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1g</td>
<td>1g</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>3g</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25g</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Footnote on Daily Values (DV) and calories reference to be inserted here.
# Best Diabetes iPhone & Android Apps 2015

## Type 1

### Free

- Diabetes Logbook
- Diabetik
- Diabetes Connect
- Fooducate
- BG Monitor Diabetes
- OnTrack Diabetes
- BlueLOOP
- Glooko (cleared by FDA)
- Glucagon (How to inject glucagon for low BG)
- Carb Counting with Lenny U.S. (children)
- Managing Your Condition (app on latest diabetes stats)

### Fee

- Diabetes Pilot Pro (use week free, then monthly charge)
- Calorie Counter PRO $3.99
- Diabetes Tracker $9.99
# Diabetes Apps for Type 2

## Type 2 Free Apps

- **Diabetes in Check** by Everyday Health
- **Diabetik** by Ugly Apps
- **Diabetes Companion** by mySugr GmbH
- **iCookbook Diabetic** by Publications International
  - delivers new, free diabetes-friendly recipes every month
- **Whole Foods Market Recipes** by Whole Foods
  (General Meal Planning)
- **GoMeals** by Sanofi-Aventis (Today’s plate)
- **Foodlily** by Foodily
  - Apple App helps users find, keep track of & share receipts.
  - “Food social Network” not specific to diabetes
- **AADE goal tracker**
- **Glucose Buddy**
- **MyNetdiary Diabetes**
- **Dlife**

## Type 2 Apps with Fee

- **Track3** by Coheso  $5.99
- **CarbsControl** by Coheso  $2.99
Blood sugar testing / insulin then & now

Testing pH - calculate insulin dose

Testing blood sugars now with new machines
Insulin pumps through the years

Developed in 1960’s not able to be safe until 1990’s
Little smaller insulin pump
Today’s insulin pump & CGMS
Technology: Insulin pumps & CGMS

Dosage instructions are entered into the pump's small computer and the appropriate amount of insulin is then injected into the body in a calculated, controlled manner.
Newest blood sugar testing in Europe

FreeStyle Libre
Resources

Academy of Nutrition/Dietetics
1-800-366-1655
www.eatright.org

American Heart Association
1-800-AHA-USA1 (1-800-242-8721)
www.americanheart.org

National Diabetes Education Program
1-800-438-5383 www.ndep.nih.gov

National Diabetes Information Clearinghouse
1-800-860-8747 www.diabetes.niddk.nih.gov

National Diabetes Education Initiative
www.ndei.org/patienteducation.aspx

American Diabetes Association
1-800-DIABETES (1-800-342-2383)
www.diabetes.org  Standards of Care

American Association of Diabetes Educators
1-800-338-3633 www.diabeteseducators.org

Centers for Disease Control and Prevention
1-800-CDC-INFO (1-800-232-4636)
www.cdc.gov/diabetes

www.diabeteslivingonline.com
www.dlife.com