Diabetes and Weight Management: Tools to Affect Patient Outcomes
Today’s discussion

• Review the problem of diabetes and the importance of lifestyle intervention

• Identify current research supporting the use of meal replacements as a tool for weight loss

• Understand the role of diabetes specific meal replacements and introduce Glucerna® Hunger Smart™
The incidence of diabetes is growing and will continue at an increasing rate

In the United States:

• Every 24 hours, over 5,200 Adults are diagnosed with Diabetes
• 1 in 4 Adults have Pre-diabetes
• Diabetes will grow by over 50% over next 20 years

CDC, 2011 National Diabetes Fact Sheet; Diabetes Care, December 2009 vol. 32, no. 12, 2225-2229
Obesity is a driving force of the increasing prevalence of diabetes

**Obesity (BMI ≥30 kg/m²)**

1994

2000

2008

**Diabetes**

1994

2000

2008

CDC: National Diabetes Surveillance System.
Accessed August 11, 2011.
Benefits of Weight Reduction

• Moderate weight loss (5 – 10% of body weight) is associated with:
  – Reduced insulin resistance
  – Improved glycemic control
  – Reduced HbA1C
  – Reduced CVD risk factors
  – Delay in the onset of type 2 diabetes
Lifestyle intervention including modest weight loss can delay the onset of diabetes.

Obesity can lead to the development and progression of type 2 diabetes

- Insulin Resistance
- Hyperinsulinemia
- Impaired Glucose Tolerance
- Obesity
- b-Cell Deficiency
- Decreased Insulin Secretion
- Early Type 2 Diabetes
- β-Cell Failure
- Late Type 2 Diabetes
Tailored lifestyle intervention is critical for long-term success

- Structured, integrated, and intensive lifestyle programs focus on:
  - Modest weight loss goal (5-10%)
  - Regular physical activity
  - Diabetes education
  - Counseling / behavior change
  - Frequent participant contact
  - Individualized calorie controlled eating plan
    - Food records
    - Meal Replacements as a tool
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• Understand the role of diabetes specific meal replacements and introduce Glucerna® Hunger Smart™
Meal Replacements have substantial clinical support as effective tools to help in weight loss

Advantages of Meal Replacements:
• Portion-controlled
• Fixed calorie amounts
• Reduce choices and contact with problem foods
• Convenient to use
• Facilitate dietary adherence

1980


1990


2000


2005


2010


1990


2000


2003


2004


How effective (in terms of client adherence and weight loss/maintenance) are meal replacements (liquid meals, meal bars, frozen prepackaged meals)?

- 8 randomized controlled trials
  - 5 RCT report ≥ wt loss in subjects using diets with 1 to 2 liquid MR
  - 1 RCT report ≥ wt loss in subjects using diets with 3 or more MR
  - 2 RCT report ≥ wt loss in subjects using non liquid MR (cereal, pre-packaged entrees)
- 3 CT report successful wt loss using MR in interventions
- 1 meta-analysis of 6 RCT show ~ 3 kg > wt loss comparing MR diets to ↓ calorie diets

http://www.adaevidencelibrary.com
“Substituting one or two daily meals or snacks with meal replacements is a successful weight loss and weight maintenance strategy”

• For people who have difficulty with self selection and/or portion control
• Part of the diet component of a comprehensive weight management program

Rating: strong, Grade I
Objective
• Assess the effectiveness of weight loss in reducing cardiovascular disease events in type 2 diabetes.

Methods
• 5,145 men and women with type 2 diabetes who were 45 – 74 years of age and had a BMI ≥ 25kg/m²
• Randomly assigned to Intensive Lifestyle Intervention (ILI) or a control condition, Diabetes Support and Education (DSE)

ILI Group included:
• Weight loss goal of 10% (study goal = 7%)
• Physical activity goal of 175 minutes per wk
• Ongoing group and individual sessions
• Portion-controlled diet including liquid meal replacements

DSE Group included:
• Invited to three group sessions each yr
• Information on behavioral strategies presented but not implemented in sessions
• Information focused on diet, physical activity, or social support

Year 1 results showed significantly more weight loss with Intensive Lifestyle Intervention (ILI).

Additionally, the participants who used more meal replacements had greater weight loss.

Quartile of meal replacements (MR)

- 1st Quartile: 117 MRs, 5.9% reduction
- 2nd Quartile: 277 MRs, 7.2% reduction
- 3rd Quartile: 406 MRs, 9.4% reduction
- 4th Quartile: 608 MRs, 11.2% reduction
4 year follow-up: ILI group have sustained better outcomes than DSE group

Over four years, the Intensive Lifestyle Intervention group sustained greater improvements in multiple areas

<table>
<thead>
<tr>
<th>Patient Outcomes</th>
<th>ILI Group</th>
<th>DSE Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss</td>
<td>-6.15%</td>
<td>-0.88%</td>
</tr>
<tr>
<td>Treadmill Fitness</td>
<td>+12.74%</td>
<td>+1.96%</td>
</tr>
<tr>
<td>HbA1C Levels</td>
<td>-0.36%</td>
<td>-0.09%</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>-5.33 mm Hg</td>
<td>-2.97 mm Hg</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>-2.92 mm Hg</td>
<td>-2.48 mm Hg</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td>+3.67 mg/dL</td>
<td>+1.97 mg/dL</td>
</tr>
</tbody>
</table>

**Success Factors:** Ongoing intensive contact (group & individual), physical activity, & use of meal replacements

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Diabetes-specific products demonstrate positive effects on glycemic outcomes

Based on a system review of 23 studies (N=784 patients) of oral supplements (16 studies) and tube feeding (7 studies), with the majority comparing diabetes specific with standard formulas:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Decrease from baseline (compared to standard formulas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPG&lt;sup&gt;a&lt;/sup&gt;</td>
<td>18.5 mg/dL (1.03 mmol/L)</td>
</tr>
<tr>
<td>Peak glucose</td>
<td>28.5 mg/dL (1.59 mmol/L)</td>
</tr>
<tr>
<td>AUC&lt;sup&gt;b&lt;/sup&gt; glucose</td>
<td>31%–45%</td>
</tr>
</tbody>
</table>

ADA 2011: “it is clear postprandial hyperglycemia, like preprandial hyperglycemia, contributes to elevated A1C levels…”

<sup>a</sup>PPG = Postprandial glucose.  
<sup>b</sup>AUC = Area under the curve.


DIABETES CARE, 2011;34:S11
Diabetes specific products: Formulated to help manage glycemic response

<table>
<thead>
<tr>
<th>Source</th>
<th>Rationale</th>
<th>Specialized Nutrition to Help Manage Glycemic Response</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Fibersol</em></td>
<td>Slowly-digested carbohydrate with indigestible materials as a fiber source</td>
<td>Slow-release carbohydrate system</td>
</tr>
<tr>
<td><em>FOS</em></td>
<td>Fermentable fiber, a prebiotic</td>
<td>Well-tolerated</td>
</tr>
<tr>
<td><em>Glycerine</em></td>
<td>Fully-digested; well-tolerated; low-glycemic index</td>
<td>Supports GI health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low glycemic index</td>
</tr>
</tbody>
</table>
Glucerna® products are specially formulated for the unique nutritional needs of people with diabetes.

Developed with CarbSteady™, which includes slowly digestible carbohydrates, clinically shown to minimize blood sugar spikes.

![Graph showing smaller peak blood sugar and lower 4-hour blood sugar response with Glucerna.](graph)

- **64% Reduction**
- **Change in blood sugar (mg/dl)**
- **Time (min)**
  - 0, 30, 90, 120, 150, 180, 210, 240
  - Leading standard nutritional beverage
  - Glucerna shake
Glucerna* as a part of a diabetes management plan improves weight and other metabolic parameters

<table>
<thead>
<tr>
<th></th>
<th>Look AHEAD&lt;sup&gt;1,2&lt;/sup&gt;</th>
<th>Sun et al.&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Abbott Study BJ19&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Tatti et al.&lt;sup&gt;5&lt;/sup&gt;</th>
<th>Garvey et al.&lt;sup&gt;6&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight loss</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Reduced HbA1C</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Improved lipid profile</strong></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Improved blood pressure</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* Key Glucerna products were used as a meal or partial meal replacement as part of lifestyle intervention program.

   Glucerna shakes were one of four products used in the Look AHEAD trial.
New Glucerna® Hunger Smart™ products are designed as meal replacement options for people with diabetes

An important part of a diabetes weight loss plan

- 15g of protein to help manage hunger
- 6g of sugars
- 1 carb choice
- Low Glycemic Index
- CarbSteady to help minimize blood sugar spikes

Glucerna products are to be used under medical supervision as part of a diabetes management plan
Glucerna® Hunger Smart™ products are designed to help manage hunger, while minimizing blood sugar spikes.

**Compare to the leading meal replacement shakes used in weight loss plans**

- **Protein:** 50% more
  - Hunger Smart™: 15g
  - Leading Shakes: 10g

- **Sugars:** 66% less
  - Hunger Smart™: 6g
  - Leading Shakes: 18g

- **Carbohydrates:** 36% less
  - Hunger Smart™: 16g
  - Leading Shakes: 25g

*Based on Glucerna Hunger Smart™ Rich Chocolate Shake, Slim-Fast® Creamy Chocolate Shake, and Kellogg’s™ Special K™ Milk Chocolate Protein Shake as of Nielsen 13 weeks ending 5/28/2011. Slim-Fast® Low Carb Diet Shakes were not included in the analysis. Slim-Fast® and Special K™ are not registered trademarks of Abbott Laboratories.
Nutrition to help manage your diabetes and weight

What is a meal replacement?
Meal replacements are foods that can eat or drink as an alternative to or as part of your normal meals. They are a quick and easy way to get the nutrition you would get from a complete meal. Here are some examples:

- Shakes
- Bars
- Ready-to-mix powders
- Prepackaged meals

Why should I use a meal replacement?
Meal replacements are calorie and portion controlled. This helps you know how much food you put in your body. They take the guesswork out of meal planning for you, and they’re easy to grab when you’re on the go. You get vitamins, minerals, and other nutrients you need. People with diabetes should look for meal replacements that are specially made to help manage blood sugar.

Can meal replacements help me manage my weight?
Meal replacements can be a great addition to a weight-balanced diet. They may help you reach and maintain your weight loss goals.

“Use of meal replacements once or twice daily to replace a usual meal can result in significant weight loss,” according to the American Diabetes Association.

Can meal replacements help me manage my diabetes, too?
The right meal replacement can help you manage your weight, control your blood sugar, and provide proper nutrition—all in one serving. Read nutrition labels. Meal replacements for people with diabetes should:
- have “good” carbohydrates that break down slowly to help keep your blood sugar steady
- have less than 350 calories
- be rich in protein

How should I use meal replacements?
Meal replacements may be used in place of 1 or 2 meals, or instead of a high-fat, high-sugar snack when trying to manage weight. But they shouldn’t be used as your only nutrition source throughout the day. They can be used with other foods such as fruits, vegetables, whole-grain crackers, nuts, fat-free milk, and light yogurt.

How should I use meal replacements? (continued)
Sample meal plan
Here’s an example of a nutritious meal plan that includes meal replacements (approximately 1,900 calories):

**Breakfast**
Shake
1 ¾ cup blueberries
1 ½ cup fat-free milk

**Snack 1**
1 small apple
1 ½ Tbsp peanut butter

**Lunch**
Roasted chicken sandwich:
2 oz chicken breast, roasted
2 slice whole-grain bread
1 ½ Tbsp mustard
1 ½ cup lettuce, shredded
1 ½ small tomato slices
1 ½ Tbsp light mayonnaise
1 ½ cup carrots, sliced
2 ½ Tbsp fat-free salad dressing

**Snack 2**
3 ½ cup almonds
6 oz fat-free yogurt

**Dinner**
Grilled salmon:
2 oz salmon filet, grilled
3 ½ cup long-grain brown rice, cooked
1 ½ cup steamed broccoli
1 ½ cup white strawberries

**Snack 3**
Bar

Use meal replacements:
- Instead of skipping breakfast. Studies show that eating breakfast can help you manage weight, control hunger, and steady blood sugar levels. So, grab a shake or bar on your way out the door.
- With lunch or dinner. For example, you might have a bar or shake plus an apple for lunch.
- Rather than snacking from the vending machine. Carry a shake or bar to eat when you get hungry between meals.

Weight loss tips
1. Don’t skip meals
2. Use a small plate to help limit your portions
3. Replace 1-2 meals each day with calorie- and portion-controlled meal replacements
4. Track what you ate in a journal or by using a smartphone application
5. Slowly add 30 minutes of moderate exercises like walking into each day’s activities
6. Set reasonable weight loss goals (for example, 1-2 lbs per week)

Remember that everyone’s needs are different. Talk to your registered dietitian or other healthcare provider to learn the best way to make diabetes-appropriate meal replacements part of your diet.

Meal replacements should be used as part of a diabetes-management plan that includes good nutrition and physical activity.

*Check with your doctor before starting an exercise program.
Summary

• Modest weight loss is associated with clinical improvements for diabetes and pre-diabetes
• Utilization of meal planning tools, such as meal replacements, can help assist with weight loss
• Diabetes specific meal replacement have been clinically demonstrated to manage glucose levels and support weight loss
• New Glucerna® Hunger Smart™ was designed as a meal replacement option for people with diabetes to be used as part of a weight loss plan
Thank You!

Questions?
Win a registration to FNCE 2012

- Name, RD#, Practice setting
- Case study
  - How you are using Glucerna to support weight management or
  - Future changes that you will make to incorporate Glucerna as a tool for weight management
- Email to Linda Flanagan Vahl:
  LFLANAG@eatright.org