This is the UM Weight Management Clinic Schedule of Visits.
The visits are more frequent during the first 3 months of the program. Thereafter, the visits to the physician are quarterly (every 12 weeks) and monthly to the dietician.
Weight Management Program: The *Clinical* Components

• 100 week program
  
  ➢ *Participant signs contract agreeing to attend 80% of visits*

• Number of Physician Visits: 11

• Number of Dietician Visits: 26
The Scope of Obesity
Where is obesity most common in the US?
Obesity Rates: United States

Obesity is especially common in the South. It has 10 out of the 12 states with the highest obesity rates, including Mississippi along with Alabama and Tennessee, which tied for second place.
Michigan is one of 12 states with a prevalence of obesity greater than 30%.
Energy weight is determined by the balance between the calories we consume and the calories we expend (aka: “burn”).
What are the consequences of too much weight? Overnutrition leads to a number of metabolic problems that lead to diseases such as diabetes and heart disease.
Obesity Health Risks:

- Heart disease
- Stroke
- Diabetes
- Kidney disease
- Blood clots
Obesity Health Risks:

Breathing problems
Cancer
Pregnancy complications
Fatty liver disease
Premature death
Overweight and Obesity are a response to an environment of too many calories and/or sedentary lifestyle in genetically susceptible individuals. At the moment, we cannot change our genes. We can influence “early life events” or “epigenetics” of our children by maintaining a healthy weight or reducing weight in women and men \textit{before} pregnancy.
In addition, lifestyle habits adopted in childhood can result in excess weight and poorer health in adulthood perpetuating the vicious cycle.
What are some of the external factors contributing to the rise in obesity?
Economic & Environmental Factors

• Reduction in job strenuousness

• Hours spent in our cars commuting

• Reduction in food prices introduced by technological change
Economic & Environmental Factors

• Increased demand for inexpensive convenience food and one-stop shopping

• Habit/pattern of food consumption

• “Addiction” to macronutrients

• Increased food-away-from home

• Domestic Appliances

• Increase in tobacco prices leading to smoking cessation (yeah!), but leading to increase in food intake
Food intake is a complex process. The **amount and type** of food ingested is determined by:

- Genes
- Environmental setting
- Experience
Regulation of feeding

Why we eat, what we eat and the amount we eat is governed by:

- Taste perception
- Meal size, calorie density
- Environmental setting
- Signals from our gut system and fat tissue relay information to our brain and visa versa to tell us we are hungry or full.
“Caloric density” as a concept

Think of foods in terms of calories per pound

- Fresh corn: 490 calories
- Tortillas: 1000 calories
- Tortilla chips: 2450 calories
“Caloric density” as a concept

Think of foods in terms of calories per pound

The lower in caloric density, the greater the volume and the fewer the number of calories. Fresh corn has far fewer calories than a similar serving size of tortillas (made from corn) and Tostito’s® (a product of corn).
Gut Peptides - Satiety Signals

Our sense of hunger and fullness are determined by complex interactions between a number of peptides (proteins) and hormones (such as leptin, PYY, CCK, ghrelin, and insulin) that relay signals from our gut to our brain. We are studying these signals and processes.
As you may know, our eating patterns are affected by more than the caloric and nutritional value of food. The emotional and pleasurable aspects of feeding affect food intake.

It will come as no surprise, then, that the brain (particularly parts of the brain called the hypothalamus and the brainstem) has a central role in coordinating the many nutrient, hormonal, and behavioral signals to regulate food intake, metabolism, and ultimately body weight.
There are other parts of the brain involved in mediating the motivational (drive to eat), cognitive, and emotional components of food intake. Gaining a better understanding of the brain’s role in weight is one of our goals.
Randomized, Clinical Trials to Prevent Diabetes by Lifestyle Modification

The UM Weight Management Clinic program has modeled itself after large studies of lifestyle intervention. We have summarized data from some of these studies:
Randomized, Clinical Trials to Prevent Diabetes by Lifestyle Modification

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<th>Study*</th>
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*All study populations had impaired glucose tolerance

*Nature Clinical Practice 2008; 4:382-393
Randomized, Clinical Trials to Prevent Diabetes by Lifestyle Modification

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These two trials split a large group of individuals at high risk for diabetes into two groups:
1. usual care
2. intensive lifestyle intervention = eating a low calorie diet of 1,500 calories per day and exercising 150 minutes per week.

*All study populations had impaired glucose tolerance*
Randomized, Clinical Trials to Prevent Diabetes by Lifestyle Modification

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Those that achieved a 5-7% weight loss from baseline weight reduced their risk of progression to diabetes by 58%. This is better than any study that used medications as the primary treatment.

*All study populations had impaired glucose tolerance

*Nature Clinical Practice 2008; 4:382-393
## Randomized, Clinical Trials to Prevent Diabetes by Lifestyle Modification

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*Lifestyle change continues to be reasonable, rational and feasible approach to weight management and risk reduction of chronic diseases.*

*All study populations had impaired glucose tolerance*
76% of patients had remission of diabetes at follow-up. 100% of patients with new onset diabetes had complete remission (data not shown).
57% of patients were on one medication for diabetes or no medications at follow-up (metformin being the medication not discontinued).
Goal: Identify strategies that will result in long-term weight management for obese individuals, using the latest research and clinical strategies.

We are dedicated to educating, motivating, and empowering individuals to make healthy lifestyle choices!
Comprehensive Adult Weight Management Clinic
Personalized Weight Management Program

- Multidisciplinary approach to weight loss and weight maintenance
- Intensive induction phase
- Advice regarding activity/exercise/conditioning
- Individual one-on-one sessions
- Focus on prevention of weight regain
  - Behavioral
  - Nutritional
  - Pharmacological
Stepped Obesity Treatment Regimen

What happens at the first visit to the physician?
• Your health and weight history is obtained.
• A physical exam is performed.
• Your current medication list is reviewed.
• The research is discussed and your consent to participate is obtained (if you are interested).
Change medication regimen

1. Eliminate ‘weight positive’ medications
2. Substitute weight neutral or weight negative medications
Initiate caloric restriction

• Initial very-low-calorie diet (VLCD) (800 cals/day) or low-calorie-diet (LCD) (1000-1200 cals/day):

• Meal substitution/replacement

• Dietary counseling: One-on-one with RD

• Initial emphasis on calories and caloric density, not fuel

The meal replacement diet will not start until you meet formally with the program’s dietitian.
Exercise prescription

- Individual preference/Get moving
- Bouts of activity v. all at once
We know that weight loss at 2 weeks is associated with the amount of weight loss at 4 weeks. Therefore, if the weight loss goal at 2 weeks is not what is expected, we will re-assess any barriers or issues related to diet and help you navigate through any challenges. If the weight loss at 4 weeks is again less than expected, we will discuss alternative strategies and/or programs.
Research Component ("phenotyping")

- Integral to the understanding of obesity
- Examination of gene-gene interactions and gene-environmental interactions - understanding the biology of weight regulation
- Identifying the factors that predict success for weight loss and maintenance of weight loss – key to changing our treatment paradigms
- Examining potential novel therapeutic targets
- Participation is VOLUNTARY
Research Program Component

• There are research programs offered by UM
• These programs are separate from the clinical program, but can be helpful to add important information to help you manage your health
• Participation is voluntary
Procedures
Mixed Meal Tolerance Testing:
3 hour test examining hormones (insulin, glucose, and fat hormones) in response to nutrients.

• Metabolomics is the analysis of small molecules that generate a specific fingerprint of your current metabolic state at any given time point. It allows us to characterize some of the dynamic changes that occur in response to nutrients.

• DNA looking at obesity-related genes
~1/3rd of the participants in the program have Type 2 diabetes mellitus and many were undiagnosed prior to OGTT.

Oral Glucose Tolerance Test: 2 hour test to diagnose diabetes*.

Fat and muscle biopsies

Body composition by DEXA or BodPod.

Questionnaires regarding overall health and impact of weight on emotional and physical well-being

Resting Energy Expenditure and Exercise Capacity (REE, VO2 max)
DXA measures body composition including fat free mass, fat mass and bone density.
Bod Pod—alternative method to measure fat free mass and fat mass
Resting Energy Expenditure—measures the fuel the body burns at rest (the number of calories burned at rest)
V02 max—Exercise capacity is highly predictive of disease risk, longevity and may predict the ability to lose weight. Graded exercise test done on a treadmill.
**SenseWear Triaxial Accelerometer**

- Movement/motion sensor
- Worn for 7 days at intervals:
  - Baseline (prior to diet)
  - 4 weeks (~5% weight loss from baseline)
  - 8 weeks (~10% weight loss from baseline)
  - 12 weeks (~15% weight loss from baseline)
  - 6 months, 12 months and 24 months
What will be done with the research information?

• If you participate in research, information and data that is relevant to your care will be shared with you. This information includes your resting energy expenditure, your VO2 max (aka: exercise capacity/level of fitness), your body composition data from DEXA, and your oral glucose tolerance test results.

• This information is NOT shared with your insurance company.
Re-Phenotyping:
You will have the option to repeat the testing after the initial 15% weight loss goal is achieved.
How are participants doing in the clinic?

What results have we seen from our data?

• Individuals have lost substantial amounts of weight.
• This weight loss has continued past the initial 3 month period
• They have kept the weight off and, at 60 weeks, there is an average loss of 57 lbs for men and 46 lbs for women
• (see graph on the next slide)
Weight Maintenance by Sex

Number of Weeks in Program

Weight (kg)

Baseline Week 2 Week 4 Week 8 Week 12 Week 18 Week 24 Week 28 Week 32 Week 36 Week 40 Week 44 Week 48 Week 52 Week 56 Week 60

Male Female
Those who complete our 2 year program continue to have markedly reduced weight from baseline weight despite some weight regain (which we expect) and why we have aggressive weight loss goals early in the program. Those who withdrew, lost weight initially, but regained most of their weight lost.
The University of Michigan’s Weight Management Clinic (WMC) Program: Overview
Program Design

• Highly structured to make weight loss easier and more successful.

• Shakes and soups replace meals and snacks.

• Support provided through individual appointments with physician and dietitians.

• Daily physical activity aids in weight loss.
12 weeks...
Very Low Calorie Diet (VLCD) Phase

- Initial 12 weeks: 800 calories per day
- Foods Allowed:
  - Optifast 800 Shakes or Ready to Drink Shakes
  - Optifast Bars
  - Optifast Chicken or Tomato Soup
Meal Replacement Prescription

- Personalized for you
- Average prescription: 4 - 5 Optifast Shakes + 1 Optifast Soup
- Concept: “More is Better” but “Stay in the Box”
Why use a Very-Low Calorie Diet (VLCD)?

- Short term only: initial 12 weeks
- Medically supervised, guaranteed weight loss
- Divorce yourself from unhealthy food habits by making meals “decision free”
- Learn nutrition information, lifestyle and behavioral skills
When is a Full Meal Replacement Diet used?

• Full meal replacement diets are appropriate for patients who have a significant amount of weight to lose and:

• Cutting back on food or following a reduced calorie meal plan has not helped the patient lose weight in the past

  -or-

• The patient has a history of several previous diet attempts but has not been able to sustain weight loss
Meal Replacements Enhance Initial and Long-term Weight Loss

- The following slide summarizes data from one scientific study that helps illustrate why we elect to use an aggressive meal replacement strategy.

- The graph shows a comparison of a conventional diet versus a meal replacement diet (with eventual transition to food).

- The results show that at the end of the study period, despite both groups being on similar diets, the group that started with meal replacement lost more weight, overall.
Meal Replacements Enhance Initial and Long-term Weight Loss

*1200–1500 kcal/d diet prescription.
CF=conventional foods.
MR-2=replacements for 2 meals, 2 snacks daily.
MR-1=replacements for 1 meal, 1 snack daily.

Fletchner-Mors et al. *Obes Res* 2000;8:399
Weight Maintenance Phase

• Following 15% weight loss, food is reintroduced.

• An individualized diet plan is designed and implemented.

• Maintenance calorie amount is calculated and personalized.
Can people with diabetes use Optifast shakes?

- Yes. Optifast is frequently recommended by doctors for their patients with diabetes because of the foods' nutritional formulation and low calories.

- Your medication(s) will be monitored by our physicians, and dosage may change throughout the program.
Can I use Optifast shakes if I have food allergies?

• Optifast products are generally well tolerated by most people.
• Optifast POWDERED shake mix (chocolate, vanilla, and strawberry) DO contain lactose. All other products are lactose-free.
• Some of our products, however, contain common allergens such as dairy, eggs, wheat, soy and peanuts.
• Please let us know if you have any allergies prior to beginning the shake regime, or if any GI discomfort occurs.
Blender Instructions:
1. Pour 6 oz. cold water into a blender. Begin mixing on lowest speed.
2. While blender is on, add 1 packet Optifast shake mix and blend for 10 seconds.
3. Add 2 ice cubes, 1 at a time (replace blender cover in between)
4. Continue to blend on low speed for 1 – 1 ½ mins. until ice is crushed & shake is smooth
Meal Replacement Prescription:

Add non-caloric flavorings for variety:
- Spices or seasonings
- Extracts
- Diet soda
- Sugar free pudding or Jell-O mix
- Sugar free Crystal light
- Sugar free coffee syrup
Costs of Optifast:

You are responsible for purchasing the product (~$2.50 per shake or ~$12-14/day). **Insurance does NOT cover the cost of meal replacements.**

*Of note:* The average American spends $151/week on food according to the US Bureau of Labor Statistics Consumer Expenditure Survey.
Cost Comparison for other diet programs or products

• **NutriSystem**: $10 - $12 dollars/day, vitamins sold separately, $30 cancellation fee

• **Jenny Craig**: $7.50/month program fee + cost of food ($15+/day) + shipping

• **Weight Watchers**: $52/month + price of food (varies)

• **South Beach**: $12/month (on-line community only) + price of food (varies)

**Prices may vary, based on location and special promotional deals**
Cost Comparison for other convenience foods/meals

• **Breakfast**: Starbucks Bagel with cream cheese (~$2) plus grande regular coffee (~$1.70)
• **Lunch**: Wendy’s Spicy Chicken Sandwich combo with fries and drink (~$6.39)
• **Dinner**: Panera Fuji Apple Chicken Salad (~$7.39) with iced tea (~$2.39)
• **Snack**: Slimfast Shake (~$2.25)

**TOTAL: $22.12**

**Prices may vary, based on location and special promotional deals**
Physical Activity

- Daily exercise is tracked
- Active lifestyle is encouraged
- Further recommendations will be based on the individual
Please fill out “Initial Evaluation Form” and all the questionnaires BEFORE your first physician visit. These must be mailed, emailed or faxed before an appointment can be scheduled. Contact information is provided on The Weight Management Program home page.

- [http://www.med.umich.edu/intmed/endocrinology/weightmanagement/forms.htm](http://www.med.umich.edu/intmed/endocrinology/weightmanagement/forms.htm)
Questions or concerns?

Please contact:
- Nicole Miller, MPH, RD: npiazza@med.umich.edu
- Amy Rothberg, MD, PhD: arothber@med.umich.edu
- Christine Fowler, RD: cefowler@med.umich.edu
- Andrew Kraftson, MD: andrewkr@med.umich.edu
- Nevin Ajluni, MD: noksuz@med.umich.edu
- Catherine Nay, MEd, RD, CHES: catkraus@med.umich.edu

Need to set up your first nutrition visit or reschedule?
Please call: 734-647-5871
Publications

• The Impact of weight loss on health-related quality of life

• The impact of a managed care obesity intervention on clinical outcomes and costs: A prospective observational study

• Very-low-energy diet for type 2 diabetes: An underutilized therapy?
Thank you!