

## Web-based App for Personalized Patient-Guided Nutrition Therapy for Weight Loss

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1



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**Mission:** To impact health through creation of community-driven solutions informed by science in support of healthy eating, active living, and decreased obesity.

**Strategy:**

- Align with the needs of region - use Collective Impact Model
- All levels of the social ecological environment
- Functional cores of expertise



**CCHI Functional Cores**

2

## Partnership Areas



Food Systems



Metabolic Health  
in Primary Care



Workplace  
Wellness



School Wellness



Built  
Environment

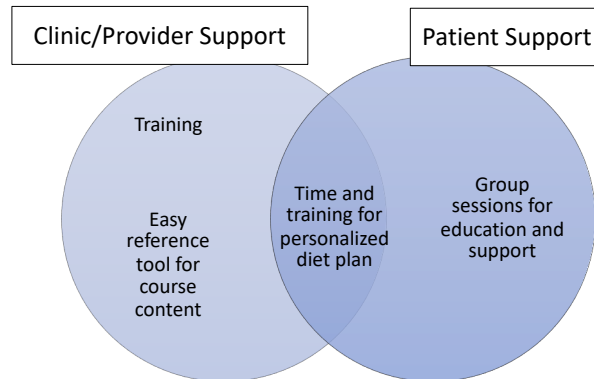
3

## Origins: the need for comprehensive obesity management program



4

## Obesity Management Program



5

## Lifestyle Modification Treatment

- emphasizes behaviors that are ideal from a scientific perspective
- conformation is expected

6

## CAP-LMT



Compatibility-based



Allocation-focused



Progress monitoring



Lifestyle Modification Treatment

A structured and stepwise approach to construct a comprehensive, highly individualized plan for greater compliance and better weight loss outcomes.



- 1117 patients
- 15 weeks
- 10-13% weight loss

Dhurandhar & Kulkarni, International J Food Sci & Nutr, 1993; 44:73-83

7



**SMALLCHANGES**



**UTHealth®**  
The University of Texas  
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With funding from:



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8

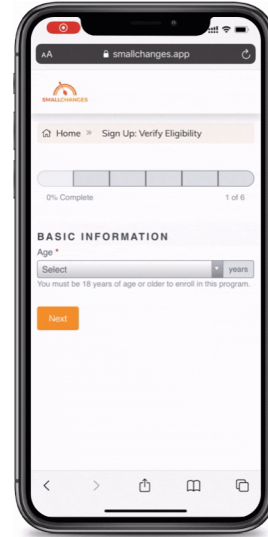


## Sign Up: Current Weight and Measurements

Enter your current weight and measurements, so we can calculate your daily calorie requirements.

### Why?

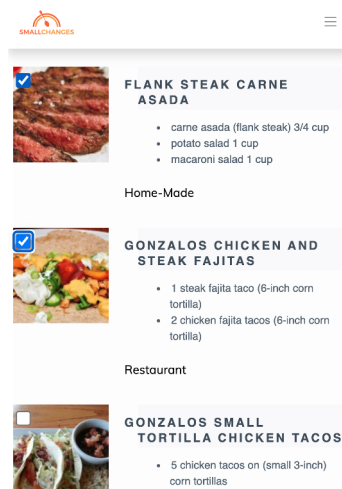
The recipes you see in your Change Plan are unique to your calorie requirements.



10

## Sign Up: Create Your First Change Plan

For each mealtime, from a list of foods, choose FOUR meal options that are closest to what you *currently* eat.



11

# My Current Breakfast Habits

Oatmeal

Basic-4 Cereal

Eggs, over-easy with toast.

McDonald's Breakfast

12



Oatmeal



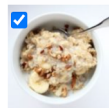
Basic-4 Cereal



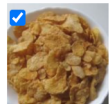
Eggs, over-easy with toast.



McDonald's Breakfast



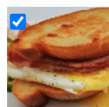
**OLD FASHIONED OATMEAL**  
oatmeal 3/4 cup raw cooked with 1 1/2 cups 1% milk  
Home-Made



**KELLOGG'S ORIGINAL CORN FLAKES**  
corn flakes 1 1/4 cup, milk 1% 2 1/4 cup  
Home-Made



**HUEVOS A LA MEXICANA**  
corn tortilla 1 (6-inch), 2 eggs cooked, 1/4 onion, 1/4 tomato, 1 tbs cilantro and jalapeno mix, 1 tbs mozzarella cheese



**MCDONALD'S HAM, EGG, AND CHEESE MCMUFFIN**  
egg McMuffin (ham, cheese, egg) with 1 hashbrown

13

## Follow your Plan:

- Get a Flexcipe for each meal option.
- The ingredient amounts in your Flexcipe are specific to **your** calorie level, and they change as you lose weight.
- Follow the "Flexcipe" as closely as possible.



### HUEVOS A LA MEXICANA

📍 Restaurant ⌚ Breakfast 📅 2200 Calories/Day Plan [Print Flexcipe](#)

#### INGREDIENTS

TO MAKE 2 WEIGHT-LOSS PORTIONS :

Change Number of Portions: ▼

- 4 eggs
- 1/2 onion
- 1/2 fresh tomato
- 1/4 jalapeño
- 4 tsp canola oil
- 4 tsp oregano (dry)
- 1/4 cup chopped cilantro
- 2 tsp salt
- 2 tbs mozzarella cheese

#### DIRECTIONS:

1. Saute onions, oregano, and jalapeno for 1-2 minutes
2. Add chopped tomatoes and cook for 2 minutes
3. Add in eggs and scramble them into the sauce

14

**Each day, for each meal, choose any one option from your Change Plan.**

#### BREAKFAST



[Old Fashioned Oatmeal](#)



[McDonald's Ham, Egg, and Cheese McMuffin](#)



[Kellogg's Original Corn Flakes](#)



[Huevos a la Mexicana](#)

15

**Each day, for each meal, choose any one option from your Change Plan.**

#### LUNCH



Ramen Noodles with Chicken and Vegetables



Hot Pocket (Chicken and Cheese) with Knorr Sopa De Fideos Con Pollo



Fideo



Beef Burrito with Fruit and Corn Salad

16

**Each day, for each meal, choose any one option from your Change Plan.**

#### AFTERNOON SNACKS



Mixed Nuts



Chicken Salad



Cheese-Only Quesadilla



2% Fat Cottage Cheese with Fruit

17

**Each day, for each meal, choose any one option from your Change Plan.**

#### DINNER



Milanesa



Little Caesars Pizza



Chile Relleno



Chicken Flautas

18

**Enter your weight every week to track your progress and enable Small Changes to automatically adjust your Flexcipes (if needed).**



#### CHECK IN

##### MEASUREMENTS

Weight

☒ pounds

☐ kilograms

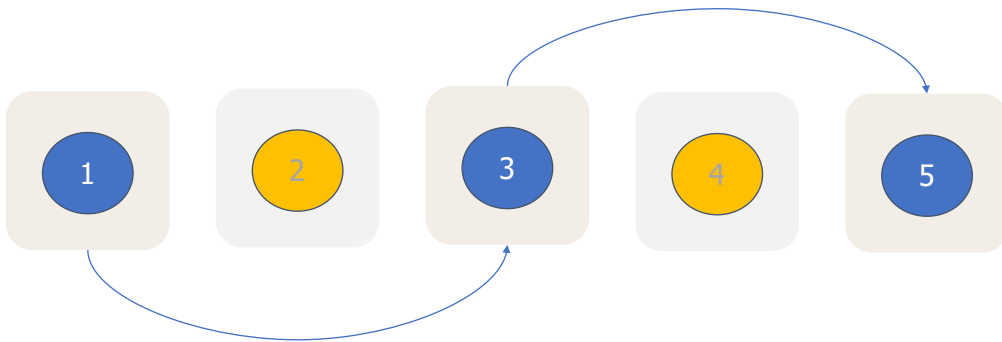
Weight in pounds \*

pounds

19



**Choose new options and get a fresh Change Plan every two weeks.**

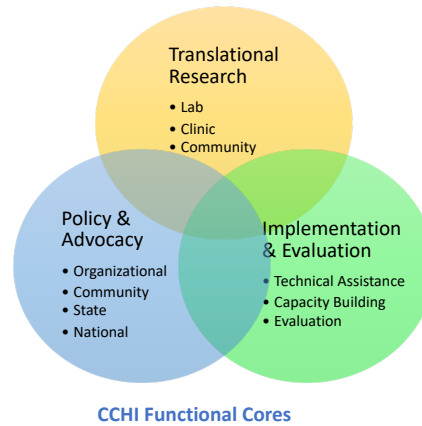
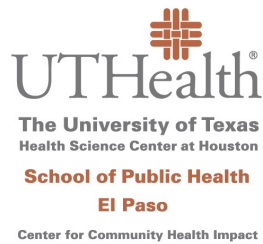


20

**Stick to Your Small Changes Plan and  
Get Big Results.**

21

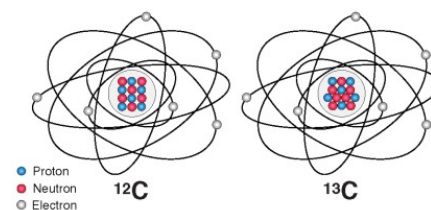
# Translational Research



40

## Stable Isotopes

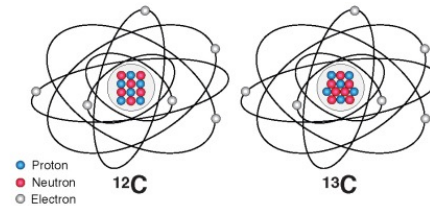
- Stable isotopes are heavier due to an extra neutron(s)
- $^{12}\text{C}$ : 6 protons and 6 neutrons
- $^{13}\text{C}$ : 6 protons and 7 neutrons



41

## Stable Isotopes

- Stable isotopes: maintain constant concentrations over time
- Unstable isotopes: disintegrate at predictable and measurable rates by emitting a nuclear electron or a helium nucleus and radiation
  - In nature, light isotopes are far more abundant than the heavy.



42

## Isotope Discrimination or Fractionation

The separation of isotopes of an element during naturally occurring processes as a result of the mass differences between their nuclei.

43

## Isotope Discrimination: Diet

- Different foods have different isotopic ratios.
- As macronutrients are metabolized for energy, the carbon structures from the diet are converted to  $\text{CO}_2$ .
- The isotopes of carbon in exhaled breath, in the healthy state, reflect the isotope ratio of the diet.

You are what you eat...or at least your breath is.

44

## Isotope Discrimination: Fuel Use

- A second and equally important isotope discrimination for our approach occurs during the conversion of glucose to lipids
- This isotopic discrimination results in lipids being about 3.5 ‰ lighter than carbohydrates

45

## Proof of Concept Study

- Can breath carbon stable isotope ratios be used to track energy balance?



International Journal of Obesity (2014) 38, 1248–1250  
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www.nature.com/ijo

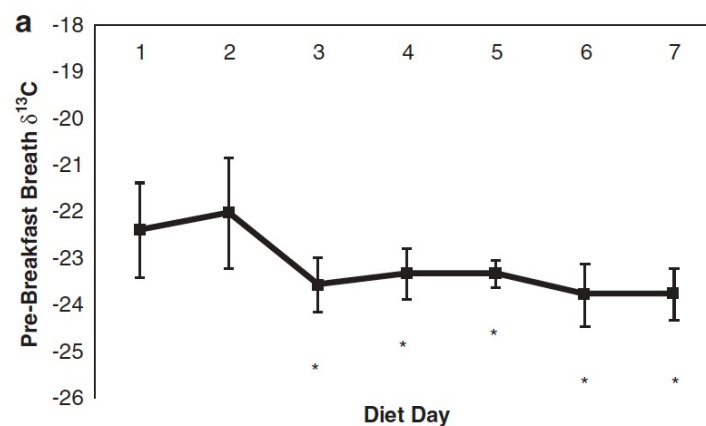
### SHORT COMMUNICATION

Breath carbon stable isotope ratios identify changes in energy balance and substrate utilization in humans

LD Whigham<sup>1</sup>, DE Butz<sup>2</sup>, LK Johnson<sup>3</sup>, DA Schoeller<sup>4</sup>, DH Abbott<sup>5</sup>, WP Porter<sup>6</sup> and ME Cook<sup>2</sup>

46

## 7 days on hypocaloric diet

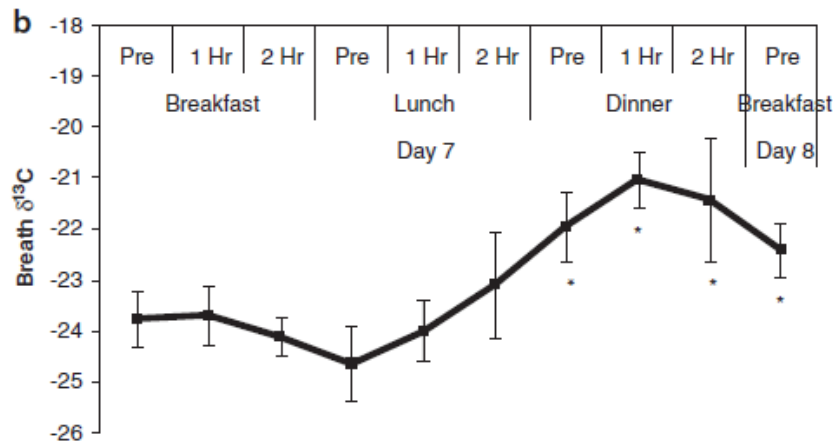


Whigham, et al. International Journal of Obesity, 38:1248-1250, 2014

47



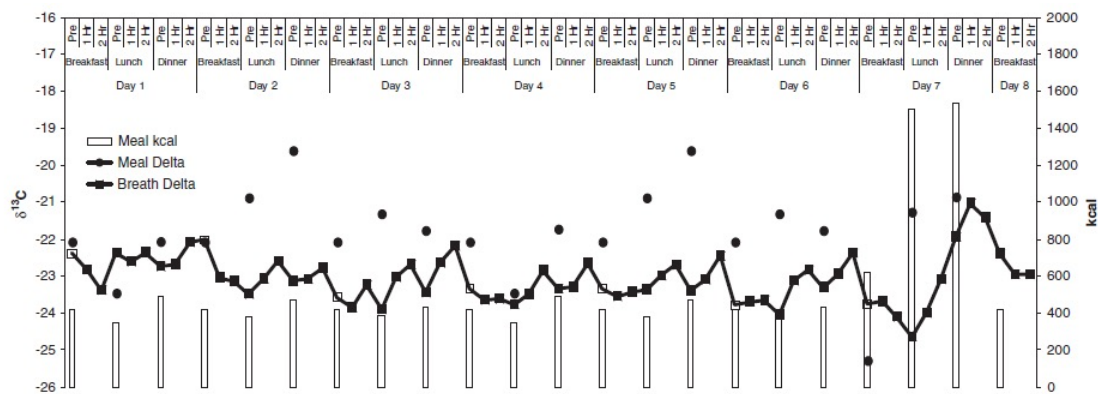
## Response to caloric over-consumption



Whigham, et al. International Journal of Obesity, 38:1248-1250, 2014

48

## Breath stable isotopes for assessing energy balance and substrate utilization

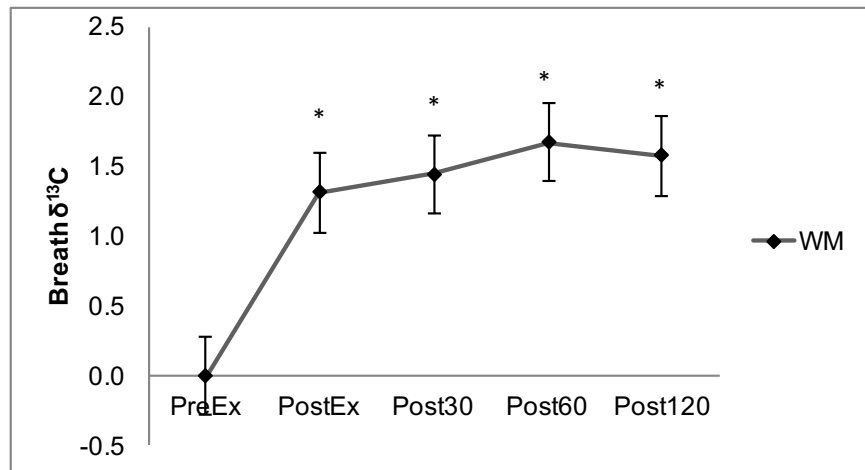


**Figure 2.** Breath  $\delta^{13}\text{C}$  values (squares) related to meal  $\delta^{13}\text{C}$  values (circles) and meal energy content (open bars). Open squares represent pre-breakfast breath  $\delta^{13}\text{C}$  values shown in Figure 1a.

Whigham, et al. International Journal of Obesity, 38:1248-1250, 2014

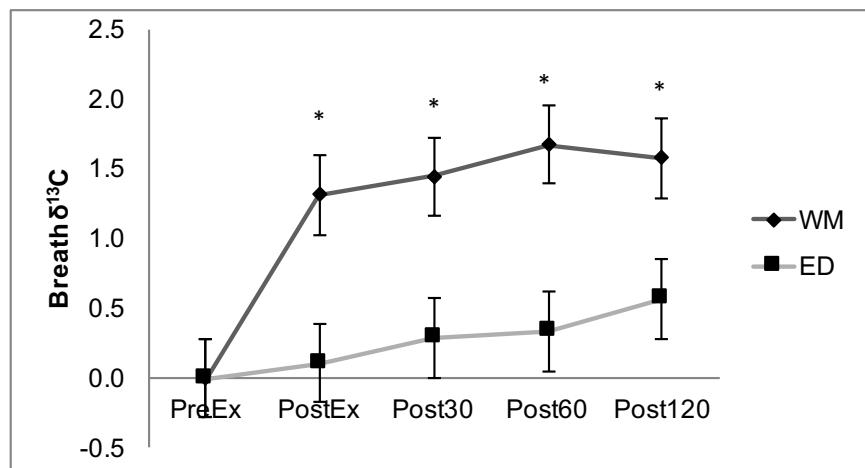
50

## Breath delta value in response to exercise



51

## Breath delta value in response to exercise



Butz ...Whigham. IEEE Eng Med Biol Soc; 2015:8205-8208.

52



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