PREDIABETES EPIDEMIC
CAN WE PREVENT DIABETES?

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Planning Committee
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1 = No relationship 2 = Relationship disclosed below
Objectives

- Review risk factors for pre-DMII
- Review treatment options for pre-DMII
- Provide practical tips in-office dietary counseling for pre-DMII

19 pound baby, heaviest born, Indonesia
September 23, 2009

Permissive v Restrictive, CPS
Creeping Calories ("Stealth" weight gain)

• To gain 1 pound/year = 9 extra kcal per day!

• 100 calorie snack packs = 10 pounds/year
• Snickers bar = 27 pounds/year

Creeping Calories ("Stealth" weight gain)

• 100 calorie snack packs = 10 pounds/year

• BUT, you could lose 10 pounds a year by cutting back by 100 calories!

April 8, 2007

“Severely obese are the fastest growing group of overweight people in the US”

From 2000 to 2005:
BMI > 30 increased by 24%
BMI > 40 increased by 50% (100+#)
BMI > 50 increased by 75% (175+#)

Journal of Public Health 2007
EHR Review of Dx of Obesity

- For pts with a BMI of 30 or greater
EHR Review of Dx of Obesity

- For pts with a BMI of 30 or greater
- **ONLY 22%** had the diagnosis in their chart
  (AMC 2012)

- Pts with BMI > 30:
  - 70% were **not diagnosed**
  - 63% received no counseling for diet, exercise, or weight reduction
  (Ma J, Obesity, Feb 2009)

Vitals are “vital!”

- **CAN'T USE YOUR EYES**
  - The adult “visual norm” of “average build” is overweight or obese
  - *Especially in healthcare*
Vitals are “vital!”

- CAN’T USE YOUR EYES
  - The adult “visual norm” of “average build” is overweight or obese
  - Especially in healthcare
  - Average Height and Weight stats US (CDC):
    - Women: 5’4 165# BMI 28 WC 37
    - Men: 5’9 195# BMI 28 WC 39

“Average” ≠ healthy weight!!!

Patients lack understanding

- What is healthy weight would be for them?
  - 57% OB men
  - 30% OB women
  - do NOT choose a weight in the healthy BMI range

(McTigue, Diabetes Care, March 2006)

Apples v. Pears
BMI 20

pear

BMI 40

apple

Fat is the largest endocrine organ in the body

Current added sugar intake

- 2005-2010 NHANES data (AHA.org)

- US average:
  - Boys 362 kcal 16.4 tsp
  - Men 335 kcal 20.9 tsp
  - Girls 282 kcal 17.6 tsp
  - Women 230 kcal 14.3 tsp
AHA – How much sugar is recommended per day

- Men:
  - 150 kcal per day (current 335 kcal)
  - 9 teaspoons
- Women:
  - 100 kcal per day (current 230 kcal)
  - 6 teaspoons

Fat, Salt and Sugar and the brain

- PET Scan data
- Normal obese
- ETOH cocaine
- Red = dopamine
- Loss in addiction

Prevalence of Pre-Diabetes

- In 2012, 86 million Americans (1 in 3) aged 20 years or older with pre-diabetes.
Prevalence of Pre-Diabetes

- In 2012, 86 million Americans (1 in 3) aged 20 years or older with pre-diabetes.
- Without lifestyle changes to improve their health, 15% to 30% of people with pre-diabetes will develop DMII within five years.

Risk Factors for pre-diabetes

- **#1 is weight status**
  - Abdominal adiposity
  - MONW (BMI < 25 but *apple shaped*)
  - Family history
  - High TG, low HDL – *missed opportunity*
    - Especially with discordant lipids
    - Ie TG 150 but LDL 70
Risk Factors for pre-diabetes

- Inactivity
- "Advancing age"
- After age 45 (!!)
- Race
  - African-Americans, Hispanics, American Indians, Asian-Americans and Pacific Islanders

Risk Factors for pre-diabetes

- GDM
- PCOS
- **Lack of sleep**
  - Increases insulin resistance
  - Undiagnosed OSA

Screening for pre-diabetes

- ADA in 2010 recommended A1c
  - Normal
  - Pre-DMII
  - DMII
Screening for pre-diabetes

- ADA in 2010 recommended A1c
  - Normal \( \leq 5.6 \)
  - Pre-DMII 5.7-6.4
  - DMII \( \geq 6.5 \)

Insurance issues

- CMS coverage is limited (private insurance has more lenient dx guidelines)
- Secondary diabetes, GDM, abn GTT
- Hypoglycemia
- Glucagon or pancreatic d/o, HH/Fe
- Abnormal BS
  - 100 or greater for fasting
  - Use of insulin

Insurance issues

- CMS coverage is limited (private insurance has more lenient dx guidelines)
- “long term use of medication” V58.6
  - Antipsychotics
    - is a HEDIS measure to monitor lipids and blood sugar!
  - Steroids
  - HAART
Insurance issues

• CMS coverage is limited and **DOES NOT INCLUDE**
  • Obesity, morbid obesity
  • Hypertriglyceridemia
  • Abnormal weight gain, weight loss

• You can download CMS PDF for coverage questions

Current Dietary Trends

Calories US persons over age 2

- **Year:** 1977 1991 2006
- **Cal:** 2090 2297 2533

- Increased portion sizes
- More Na, sugar, fat and sugar sweetened beverages
Thermic Effect of Food

- How much energy it takes to break down the food
- Meaning NET calories are NOT the same

Thermic Effect of Food

- How much energy it takes to break down the food
- Raw food v. cooked food

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- Lean protein (chicken, eggs) up to 30%
**Thermic Effect of Food**

- How much energy it takes to break down the food
  - Raw food v. cooked food
  - Lean protein (chicken, eggs) up to 30%
  - Complex CHO up to 20%
  - Simple/processed CHO 3%
  - Fat 3%

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**Satiety issues**

- Protein more “filling” than carbohydrates
  - Fats are filling/satisfying to taste buds
    - But high in calories
  - Distention of the stomach
    - Liquids v. solids
- **Food affects your behavior!**
  - Cravings, preferences
The problem with liquid calories

- Purdue study (adults): (Dimeglio, Int J Obes Relat Metab Dis, June 2000)
- 450 cals: jelly beans v. soda

- Jelly bean MORE food intake
- Soda LESS food intake

- Relates to satiety signals

Change in SSB since 1970s

- Soda, fruit drinks, energy drinks, vitamin water
- 1977 64 calories
- 2006 141 calories

- Because they elicit a weak compensatory dietary response, they increase the risk of positive energy balance.
Many pts have “gotten rid of soda”

**SSB**

- They drink JUICE, gatorade, sports drinks, energy drinks, lattes, sugared ice tea (Arnold Palmer)
- Low sugar beverage = ≤10cal/8oz
- Artificial sweetener - do not cause cancer 
  BUT…? alteration of gut bacteria, increase sweet cravings

Many cereals have more sugar than a twinkie or cookies

**Environmental Working Group**

- analyzed the nutrition labels of 84 popular children’s cereals and found that:
- more half of the brands they reviewed deliver more sugar than three Chips Ahoy! Cookies

Adult Exercise Recommendations

- **Sedentary lifestyle is a risk factor for early death**
- CDC guidelines
  - 150 min/wk of **moderate-vigorous** activity
  - 75 min/wk of **vigorous** activity
- Should be in at least 10 min sessions
- 2 day week of strengthening exercises
  - [http://www.cdc.gov/nccdphp/dnpa/physical/pdf/PA_Intensity_table_2_1.pdf](http://www.cdc.gov/nccdphp/dnpa/physical/pdf/PA_Intensity_table_2_1.pdf)

Adult Exercise Recommendations

- Cardio improves **weight loss and WC**
- Walking –
  - improves BP, glucose control, MetS, HTN
  - 10,000 steps (5 miles)
  - Ok to break up: two 15 minute sessions

What is a “brisk walk?”

- A pace fast enough to raise HR
- Very de-conditioned pts may start out slow
- Paces:
  - 2 mph toddler pace
  - 3 mph “moderate” = 100 steps/min
  - 4 mph “brisk”
  - 5 mph jogging
Lifestyle v. Metformin in DPP

- Metformin
  - Reduced risk of develop DMII by 31%
  - Was least effective in 45 and older
- Lifestyle
  - Reduced risk of develop DMII by 58%
  - Was most effective in 60 and older

Lifestyle v. Metformin in DPP

- Secondary analysis:
  - weight loss was the main predictor of reduced risk for developing diabetes in DPP lifestyle intervention group participants

Reduce Impact of Obesity Genes by Exercise

- Nov 2011 – PloS Medicine
  - Meta-analysis, 218,000 participants
  - FTO gene:
    - risk of becoming obese was 27% lower in those who were physically active.
Reduce Impact of Obesity Genes by Exercise

- April 2010 – 20,000 individuals, 3+ yr F/U
- A physically active lifestyle is associated with
  - 40% reduction in the genetic predisposition to common obesity
  - for the 12 genetic markers.

What you eat and how you exercise......

- Can CHANGE the expression of your genes
  - (epigenetics, growing area of research/interest)
- Gut flora studies

What to counsel patients

- ELIMINATE sugar sweetened beverages!
What to counsel patients

- **ELIMINATE** sugar sweetened beverages!
- Reduce CHO and sweets
  - Portion sizes (Panera bagels, cereal)
  - Whole grain products only
  - Including SNACKS (most are CHO)
- Increase consumption of fruits/vegetables
  - Vegetables are lower in CHO and higher in fiber = more filling
What to counsel patients

- Start a cardio exercise program
- OK to break up into 15 min sessions
- **Consider PT if needed
- Internet videos at home
- Dancing
- (treats mild to moderate depression)
- (BEST treatment for fatigue)
- “23 ½ hours” TED talk – 9 minutes

National Heart Lung and Blood Institute

[Image: Obesity happens. One pound at a time. So does preventing it. Learn more →]