OBESITY: The Growing Epidemic and its Medical Impact

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EXHIBIT Name

Committee Name OBESITY

Document consists of 38 pages.

Due to size limitations, pages provided. A copy of the complete document is available through the Research Library (775/684-6827) or e-mail library@lcb.state.nv.us).

Meeting Date 11-03-03

The Continuing Evolution of Man
live large - live free

Some people have chosen to stay anonymous...

Many already decided to start living...
Prevalence of Overweight and Obesity Among US Adults

- Overweight or obese (BMI ≥25.0): 47%, 56%, 64%
- Overweight (BMI 25.0-29.9): 32%, 33%, 34%
- Obese (BMI ≥30.0): 15%, 23%, 31%

**NHANES II**
- 1976-1980 (n=11,207)
- Overweight or obese: 47%
- Overweight: 32%
- Obese: 15%

**NHANES III**
- 1988-1994 (n=14,468)
- Overweight or obese: 56%
- Overweight: 33%
- Obese: 23%

**NHANES †**
- 1999-2000 (n=3601)
- Overweight or obese: 64%
- Overweight: 34%
- Obese: 31%

*Age-adjusted by the direct method to the year 2000; US Bureau of the Census estimates using the age groups 20-34, 35-44, 45-54, 55-64, and 65-74 years
WHAT IS YOUR BODY MASS INDEX?

Chart from CDC: For Adults, aged 20 years and older
# BMI Clinical Guidelines*

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>19 - 24.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 - 29.9</td>
</tr>
<tr>
<td>Class I Obesity (Mild)</td>
<td>30 - 34.9</td>
</tr>
<tr>
<td>Class II Obesity (Moderate)</td>
<td>35 - 39.9</td>
</tr>
<tr>
<td>Class III Obesity (Extreme)</td>
<td>≥ 40</td>
</tr>
</tbody>
</table>

OBESITY is a "Gateway Disease"

Health Risks of Obesity:
High blood pressure is defined as mean systolic blood pressure 140 mm Hg, or mean diastolic blood pressure 90 mm Hg.

NHANES = National Health and Nutrition Examination Survey (Centers for Disease Control)
NHANES III Age-Adjusted Prevalence of High Blood Cholesterol According To Body Mass Index

Defined as 240 mg/dL
NHANES III Age-Adjusted Prevalence of Low HDL-Cholesterol* According To Body Mass Index

Defined as 35 mg/dL in men and 45 mg/dL in women
26-Year Incidence of Coronary Heart Disease in Men

- <50 years
- 50+ years

BMI Levels

Adapted from Hubert HB et al. Circulation 1983;67:968-977.
26-Year Incidence of Coronary Heart Disease in Women

Adapted from Hubert HB et al. Circulation 1983;67:968-977.
Cholecsctomy (Gallstone disease)

Back Pain

Other risks of Obesity

- Congestive Heart Failure
- Stroke
- Osteoarthritis
- Sleep Apnea
- Cancers
  - Colon, Breast, Endometrial, Gallbladder
The Dysmetabolic Syndrome and Type 2 Diabetes
Clinical Identification of the Dysmetabolic Syndrome
Any 3 of the Following:

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Defining Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal obesity</td>
<td>Waist circumference &gt;102 cm (&gt;40 in) &gt;88 cm (&gt;35 in)</td>
</tr>
<tr>
<td>Men</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td>≥150 mg/dL</td>
</tr>
<tr>
<td>HDL cholesterol</td>
<td>&lt;40 mg/dl &lt;50 mg/dl</td>
</tr>
<tr>
<td>Men</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>Blood pressure</td>
<td>≥130/ ≥ 85 mmHg</td>
</tr>
<tr>
<td>Fasting glucose</td>
<td>≥ 110 mg/dL</td>
</tr>
</tbody>
</table>

Age-Specific Prevalence of the Dysmetabolic Syndrome Among 8814 Subjects

Age-Adjusted Prevalence of the Dysmetabolic Syndrome

<table>
<thead>
<tr>
<th>Group</th>
<th>Men (%)</th>
<th>Women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>African American</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Hispanic</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Other</td>
<td>35</td>
<td>40</td>
</tr>
</tbody>
</table>

Obesity and Diabetes Risk

Causes of Death in People With Diabetes

The Bottom Line:
Years of Life Lost due to Obesity

Obesity Treatment Pyramid

- Surgery
- Pharmacotherapy
- Lifestyle Modification
  - Diet
  - Physical Activity

Kushner R. Courtesy of S. Klein.
Goals of the Treatment for Obesity

- Prevent further weight gain
- Reduce weight
  - 5% to 10% of baseline weight
- Improve metabolic health
- Improve general medical health
- Improve lifestyle factors
- Improve quality of life & general well being
- Long-term results (maintenance of weight lost)

Intake vs Output

- Walking = 5 kcal/minute
- 100 calories = a mile
- 1 mile = ~ 2000-2500 steps
- Burger King Whopper = 640 Calories (kcal)

To walk off a Whopper $640/5 = 128$ minutes (6 miles)
Intake vs Output

- Walking = 5 kcal/minute
- 100 calories = a mile
- 1 mile = ~ 2000-2500 steps

- Burger King Whopper = 640 Calories (kcal)
  
  To walk off a Whopper 640/5 = 128 minutes (6 miles)

“The Super Size it Society!”

Double Quarter-Pounder with Cheese 760 kcal
  + Chocolate Shake 32 fl. oz. 1150 kcal
  + Super Size Fries 610 kcal
  + 2 packets (2 tbsp’s) ketchup 30 kcal
Intake vs Output

- Walking = 5 kcal/minute
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- Burger King Whopper = 640 Calories (kcal)
  
  **To walk off a Whopper 640/5 = 128 minutes (6 miles)**

---

"The Super Size it Society!"

<table>
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<tr>
<th>Item</th>
<th>Calories</th>
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<tr>
<td>Double Quarter-Pounder with Cheese</td>
<td>760 kcal</td>
</tr>
<tr>
<td>+ Chocolate Shake 32 fl. oz.</td>
<td>1150 kcal</td>
</tr>
<tr>
<td>+ Super Size Fries</td>
<td>610 kcal</td>
</tr>
<tr>
<td>+ 2 packets (2 tbsp’s) ketchup</td>
<td>30 kcal</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2550 kcal</strong></td>
</tr>
<tr>
<td></td>
<td><strong>= 26 miles</strong></td>
</tr>
</tbody>
</table>
“State of the art” treatment program:

- Personalized assessment
- Medical assessment/referral
- Resting metabolic rate ("burn rate")
- Body composition
- Physical measurements
- Body Mass Index (BMI) & Risk Assessment
- Dietary intake analysis
- Physical activity assessment
- Behavioral assessments
- Laboratory assessments
- Individualized treatment options
Spectrum of Care for the Treatment of Obesity

Self-Help

Commercial Programs
- Assessment Management/Treatment Follow-up

Primary Care
- Medical Programs
  - Surgical Programs
    - 6-12 months for obese/overweight
    - 2-3 years for normal weight

Lifestyle Management
- VLCDs
- Special Diets
- LCDs
- Special Diets + Pharmacotherapy
- Surgery
- Psychotherapy
- Co-Morbidities

Weight Maintenance Or Loss
- Self-Help
- Commercial Programs
- Primary Care
- Medical Programs
- Surgical Programs

Behavior Modification of Diet + Physical Activity
- Lifestyle Management

*St Jeor, 2000
Matching Individuals with Treatment*

**Individual Factors:**
- Weight
- Reasonable weight
- Dieting history
- Metabolic complications
- Body Composition
- Eating Patterns
- Degree of dysphoria

**Program Factors:**
- Group Vs. Individual
- Dietary counseling
- Structured exercise
- Supervised exercise
- Professional vs. lay
- Meeting frequency
- Prepackaged foods
- Dietary supplements
- Cost and convenience
- Program length
- Severity of diet
- Therapy component
- Behavioral Component

*Brownell, et al.*
Is There an Ideal Diet???

- Easy
- Fast
- Totally satisfying
- Not restrictive (What, When, Where)
- Don’t have to count, measure or weigh
- Guarantees weight losses
- Guarantees good health
- Guarantees longevity
- Corrects health problems
- Enjoyable and tastes good

High Carbohydrate?
Low Fat???
High Protein???
Macronutrient Composition of Various Diets*

- **Avg Diet**
  - PRO (% kcal): 15
  - FAT (% kcal): 34
  - CHO (% kcal): 30
  - ETOH (% kcal): 15

- **"Moderate" FAT**
  - PRO (% kcal): 15
  - FAT (% kcal): 49
  - CHO (% kcal): 15
  - ETOH (% kcal): 30

- **Very Low Fat**
  - PRO (% kcal): 15
  - FAT (% kcal): 55
  - CHO (% kcal): 15
  - ETOH (% kcal): 30

- **Low CHO**
  - PRO (% kcal): 30
  - FAT (% kcal): 40
  - CHO (% kcal): 30
  - ETOH (% kcal): 55

- **Very Low CHO**
  - PRO (% kcal): 30
  - FAT (% kcal): 15
  - CHO (% kcal): 30
  - ETOH (% kcal): 55

*St. Jeor, 2000
Energy Balance Example*:

Patient: Female, Age 38 years, ht = 60”, wt= 180 lbs., BMI=35.2

**Intake:**

7 Day Food Record shows 2100 kcal/day average intake.  

**Output:**

1. **REE:** Mifflin-St. Jeor Equation for REE (or measured Resting Metabolic Rate)

   \[
   \text{REE (Female)} = 10 \text{ Wt(kg)} + 6.25 \text{ Ht(cm)} - 5 \text{ age (y)} - 161 \\
   = 10 \times (82\text{kg}) + 6.25 \times (152.4 \text{ cm}) - 5(38 \text{ years}) - 161 \\
   = 820 + 952.5 - 190 - 161 \\
   = 1421 \text{ (or approximately } \sim -1400 \text{ kcal/d)}
   \]

2. **Physical activity (PA):**

   \[
   \text{REE X Physical Activity Factor for sedentary activity (office worker)} \\
   \text{REE X 1.3} = 1400 \times 1.3 = \sim -1800 \text{ kcal/d} \\
   \text{Intentional Physical Activity: Pedometer} = \sim -100 \text{ kcal per day}
   \]

\[
\text{TEE} = \text{REE (1400)} \times 1.3 = 1800 + \text{Intentional PA (100)} = \sim -1900 \text{ kcal/d. -1900 kcal/d}
\]

\[
\text{Total} \quad +200 \text{ kcal/d}
\]

Recommendation for **WEIGHT MAINTENANCE** (kcal/d):

To maintain current weight this patient must decrease intake by -200 kcal/day from the current intake of 2100 kcal/d yielding a **1900 kcal/day diet**.

Recommendation for **WEIGHT REDUCTION** (kcal/d):

To lose 1 pound per week, a 500 kcal per day deficit is needed.

In this patient:

(-200 kcal/day deficit to maintain weight)

+ (-500 kcal/day deficit to lose 1 pound per week)

= -700 kcal/day total deficit needed to lose 1 lb/week

Decrease 2100 kcal/d intake by -700 kcal/d. = 1400 kcal/d dietary intake
RESEARCH GRANTS

• RENO Diet Heart Study (NIH)
  – 500 Normal and Overweight Individuals
• HOPSCOTCH (NIH)
  – 50 Overweight Mothers and preschool Children
• Nutrition Academic Award (NIH)
• DOTM: Diabetes/Obesity Treatment Module, (Nevada State Health Dept. & CDC)
• Physician Extension Model (USDA, pending)
Center for Nutrition and Metabolic Disorders
at the
UNR School of Medicine
Division of Medical Nutrition
Specializing in Weight Management, Medical Nutrition Therapy, and Metabolic Research
(775) 784-4474 x16
New Paradigm???

- Weight maintenance Vs weight loss
- Prevention of weight gain Vs. regain
- Prevention of obesity and/or exacerbation of the obese state
- Decrease or delay morbidity and mortality
- Improve health profiles/reduce risk
- Long-term strategies
- Smaller, simpler interventions
- Incremental, additive steps
- REIMBURSEMENT – Document outcomes!
- NEED STATE INITIATIVES!