Module 1
Nutritional Role in Health
Good nutrition can positively impact & influence the following:

- Weight regulation
- Mental & physical performance
- Overall energy level
- Reduced risk of short and long term diseases
- Increased quality of life
- Healthier & stronger immune system
Health Benefits of Healthy Eating and Active Living

- Helps control weight
- Reduces the risk of cardiovascular disease
- Reduces the risk of type 2 diabetes and metabolic syndrome
- Reduces the risk of some cancers
- Increases the chances for living a longer and healthier life
Poor Nutrition

Risks related to following a bad diet:

- Weight gain
- Heart disease
- High blood pressure
- High cholesterol
- Diabetes
- Cancers
- Sleep apnea & other respiratory conditions
- Decreased performance and overall work production
- Shorter Quality of Life
A Closer Look at Weight Gain

• American population
  ➢ ~66% overweight
  ➢ ~27% obese

• ~15% were obese in 1980

Reported by Centers for Disease Control and Prevention (CDC) 2012: [http://www.cdc.gov/](http://www.cdc.gov/)

Q: Why have so many people become overweight and obese over the past 3 decades?
Body Mass Index (BMI) is a number calculated from a person’s weight and height. BMI is a fairly reliable indicator of body fatness for most people.

<table>
<thead>
<tr>
<th>BMI</th>
<th>Weight Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5 – 24.9</td>
<td>Normal</td>
</tr>
<tr>
<td>25.0 – 29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30.0 and above</td>
<td>Obese</td>
</tr>
</tbody>
</table>

For a BMI calculator, go to: [WWW.CDC.GOV/HEALTHYWEIGHT](http://WWW.CDC.GOV/HEALTHYWEIGHT)
Prevalence* of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2014

Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.

*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.
Prevalence of Self-Reported Obesity Among Non-Hispanic White Adults, by State (BRFSS, 2012-2014)

*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.
Prevalence of Self-Reported Obesity Among Non-Hispanic Black Adults by State (BRFSS, 2012-2014)

*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.
Prevalence of Self-Reported Obesity Among Hispanic Adults, by State (BRFSS, 2012-2014)

*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

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Obesity is common, costly, and serious

More than one-third of adults (78.6 million) have obesity.

Since 1970, there has been a dramatic increase in obesity in the United States. Recent data suggest a slowing or leveling off of this trend.

The annual medical costs for obesity among adults in the U.S. are estimated to be $147 billion per year in 2008 dollars.

Obesity is associated with the leading causes of death in the U.S., including Type 2 diabetes, cardiovascular disease, and some cancers.
Medical Costs for Adults With Obesity Are Rising

Increased prevalence, not increased per capita costs, was the main driver of the increase in costs.

How Has Obesity Evolved So Fast?

Current Habits

• **Over-Eating**
  • Larger Portions
• **Lack of Physical Activity**

Habits being developed at a very young age

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“the first generation where children will die before their parents”

- In the US, over 12 million children & adolescents are obese
- 1 in 3 children are overweight
- Over the last two decades, the rates for overweight adolescents have tripled!
Reasons for Obesity Epidemic

- Longer work hours: Both parents working or single parent families: Less time to PT/shop/cook
- Americans drive instead of cycle or walk
- More sedentary/computer focused jobs
- Video games replaced recreation
- Fried cooking is popular where higher obesity rates exist
- High calorie drinks
  - Soft drinks, sports drinks, “energy” drinks, specialty coffees
- More high calorie foods conveniently available
  - Fast food/gas stations/convenience stores/vending machines are located on every corner
Military Not So Different

Military Personnel Health Behaviors Survey
• 2011: 65.3% of all military personnel are overweight, while 13.0% are classified as obese
  o 2008: 61.8% were overweight
  o 1995: 51.2% were overweight

Military Dependents 2005 Health Behaviors Survey
• 19% of DoD dependent adolescents are obese
  o More than any age group of non-DoD adolescents

There continues to be a clear pattern of increase and there is need for attention
Nearly 1 out of 4 young adults are too heavy to serve in our military.
Mission: Readiness is an organization of retired senior military leaders who presented to Congress:

- As of 2012, over nine million 17- to 24-year-olds in the United States are too fat or physically unfit to serve in the military
- That is 31% of all young adults

(Source: DoD)

http://www.missionreadiness.org/
10 Major Public Health Issues
Health People 2010

1. Lack of Physical activity
2. Overweight and obesity
3. Tobacco use
4. Substance abuse
5. Responsible sexual behavior
6. Mental health
7. Injury and violence
8. Environmental quality
9. Immunization
10. Access to health care
2012: Leading Causes of Death in U.S.

http://www.cdc.gov/nchs/fastats/deaths.htm

*4 of the top 7 causes of death are impacted by nutrition

- Heart Disease*  597,689
- Cancer*          574,743
- Lung Disease     138,080
- Stroke*          129,476
- Accidents        120,859
- Alzheimer’s Disease  83,494
- Diabetes*        75,119
Why is this a bad thing?
Medical Complications of Obesity

- Pulmonary disease
  - abnormal function
  - obstructive sleep apnea
  - hypoventilation syndrome

- Idiopathic intracranial hypertension
  - Stroke
  - Cataracts

- Nonalcoholic fatty liver disease
  - steatosis
  - steatohepatitis
  - cirrhosis

- Gall bladder disease

- Gynecologic abnormalities
  - abnormal menses
  - infertility
  - polycystic ovarian syndrome

- Coronary heart disease
  - Diabetes
  - Dyslipidemia
  - Hypertension

- Severe pancreatitis

- Cancer
  - breast, uterus, cervix
  - colon, esophagus, pancreas
  - kidney, prostate

- Osteoarthritis

- Skin

- Gout

- Phlebitis
  - venous stasis
<table>
<thead>
<tr>
<th>Disease</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight/obese</td>
<td>203,000,000</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>80,000,000</td>
</tr>
<tr>
<td>Diabetes</td>
<td>19,700,000</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>16,700,000</td>
</tr>
<tr>
<td>Cancer</td>
<td>12,300,000</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>11,450,000</td>
</tr>
<tr>
<td>Stroke</td>
<td>8,300,000</td>
</tr>
</tbody>
</table>

• American Heart Association (AHA). *Heart Disease and Stroke Statistics - 2013 Update At-A-Glance.*
• National Osteoporosis Foundation. *Osteoporosis Disease Statistics, 2011*
• American Cancer Society (ACS). *Cancer Facts and Figures 2012.*
# Cost of Diet & Inactivity Related Diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Disease</td>
<td>$312 billion</td>
</tr>
<tr>
<td>Cancer</td>
<td>$226 billion</td>
</tr>
<tr>
<td>Diabetes</td>
<td>$180 billion</td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
<td>$160 billion</td>
</tr>
<tr>
<td>Obesity</td>
<td>$147 billion</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>$69 billion</td>
</tr>
</tbody>
</table>

CDC estimates that if all physically inactive Americans became active, we would save $55 billion (2008 dollars) in annual medical costs.

- [http://www.nhlbi.nih.gov/about/factbook/chapter4.htm#4_7](http://www.nhlbi.nih.gov/about/factbook/chapter4.htm#4_7)
Other Costs of Obesity

Medical Costs in 2012

• ~ $1500 per year increase for an obese person compared to non-obese
• +30 – 50% more employers can charge obese workers for health insurance if they decline to participate in a qualified wellness program, per the U.S. health care reform law of 2010

Transportation Costs

• $5 billion annually for additional jet fuel to fly heavier passengers
• $4 billion annually for additional gas in cars carrying heavier passengers.
  ➢ 938 million gallons is the additional amount used per year

Consumer Spending

• $40 billion annually spent on diet products in 2008.
• $7.5 billion estimated amount clothing stores will bring in for plus size clothes in 2012.

Dor AF, Langwith C, Tan E. A heavy burden: The individual costs of being overweight and obese in the United States. The George Washington University School of Public Health and Health Services Department of Health Policy, 2010.
http://healthandwellnessmagazine.net/content/features/the-actual-numbers-of-the-cost-of-obesity/
Cardiovascular Disease

#1 killer in the U.S.

- **Heart attack**: rapid fall in heart function caused by loss of blood flow through the heart’s blood vessels

- **Stroke**: “brain attack”. Loss of brain function due to a disturbance in the blood vessels supplying blood to the brain

[Link to CDC statistics on cardiovascular disease deaths, 2010](http://www.cdc.gov/nchs/fastats/deaths.html)
Cardiovascular Disease
Risk Factors

- **Age**
  - Men over 45
  - Women over 55
- **Alcohol**
- **Family history**
  - Premature death of family member due to heart disease
- **Obesity**
  - Emphasis on waist circumference
- **Inactivity**
  - Lack of adaptation to physical stress
- **Cholesterol**
  - (Part of Lipid Panel)
- **Diabetes**
- **Hypertension**
- **Smoking**

- These four risk factors make up 90% of the total risk for developing Cardiovascular disease

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Cardiovascular Disease Treatment and Prevention

• Healthy eating pattern
  ➢ Include fruits, vegetables, whole grains, low-fat dairy, fish, legumes, poultry and lean meats

• Appropriate body weight

• Desirable cholesterol profile
  ➢ Limit foods in saturated fat, trans fats and cholesterol
  ➢ Choose fats from vegetables, fish, legumes and nuts

• Desirable blood pressure
  ➢ Limit salt and alcoholic beverages
  ➢ Optimize body weight and follow diet with plenty of fruits, vegetables, and low-fat dairy

http://www.heart.org/HEARTORG/
• Total Cholesterol
  ➢ Optimal level is below 200 mg/dl
    • Below 100mg/dl may indicate malnutrition

• LDL Cholesterol
  ➢ Optimal is below 100 mg/dl

• HDL Cholesterol
  ➢ Optimal is above 60 mg/dl

• Triglycerides
  ➢ Optimal is below 150 mg/dl
High Blood Pressure

• Blood Pressure is the pressure of the blood exerted against the walls of the arteries.

• High blood pressure increases the risk for:
  - Heart attack
  - Heart failure
  - Angina
  - Stroke
  - Kidney failure
  - Peripheral artery disease (PAD)
  - Developing fatty deposit in arteries (atherosclerosis)
Too much (excess) sodium intake increased blood pressure → increased risk of heart disease and stroke.

About 9 in 10 Americans consume too much sodium.

About 1 in 3 adults have high blood pressure (only about half have it under control).

Heart disease, stroke and other cardiovascular diseases are the #1 killer in the United States.

Lowering sodium intake lowers blood pressure.

## Blood Pressure Categories

<table>
<thead>
<tr>
<th>Blood Pressure Category</th>
<th>Systolic mm Hg (Upper Number)</th>
<th>Diastolic mm Hg (Lower Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Less Than 120</td>
<td>And</td>
</tr>
<tr>
<td>Elevated</td>
<td>120 – 129</td>
<td>And</td>
</tr>
<tr>
<td>High Blood Pressure (Hypertension) Stage 1</td>
<td>130 – 139</td>
<td>Or</td>
</tr>
<tr>
<td>High Blood Pressure (Hypertension) Stage 2</td>
<td>140 or Higher</td>
<td>Or</td>
</tr>
<tr>
<td>Hypertensive Crisis</td>
<td>Higher Than 180</td>
<td>And/or</td>
</tr>
<tr>
<td></td>
<td>And/or</td>
<td>Higher Than 120</td>
</tr>
</tbody>
</table>

(Consult your doctor immediately)
Reducing average population intake to 2300 mg per day (current recommended maximum) may…

Reduce cases of hypertension by 11 million.
Save $18 billion in health care costs.

Reducing average U.S. population sodium intake as little as 400 mg daily (11%).

Prevent >28,000 deaths.
Save $7 billion health care dollars annually.


Dietary Approaches to Stop Hypertension (DASH)

• DASH Diet is an excellent method to prevent and treat hypertension
  ➢ Focus on limiting sodium (salt) intake and increasing the amount fresh, low processed foods.

• Review the DASH Diet Fact Sheet Guide
  *Found on the next few pages of workbook

• For the entire 60+ plus page handout, go to:
Diabetes Mellitus (DM)


• 4 Types
  ➢ Gestational, Pre-diabetes, Type 1, Type 2
    * Impacted/caused by diet
  ➢ Type 1 & Type 2 once diagnosed, are not reversible

• Fastest growing disease in this country
  * Specifically Type 2 diabetes
    • Americans with diabetes has risen to more than 25 million people
      9% of the U.S. population

• #1 cause of amputations and blindness in US
Diabetes Mellitus (DM)


• Primary Types
  ➢ Type 1
  ➢ Type 2
    • Pre-diabetes is first indicator

• Fastest growing disease in this country
  ➢ Americans with diabetes has risen to more than 25 million people
    *9% of the entire U.S. population

*Directly related to diet
Type 1 Diabetes Mellitus (DM)

- The body does not produce insulin, so insulin injections are required
  - Insulin takes glucose from blood and delivers it to cells

Treatment
- Meticulously regulate diet and insulin
- Blood sugars should be measured pre- and post meals, snacks, and exercise
- Exercise guidelines:
  - Eat snack if blood sugars are below 100 mg/dl
  - Do NOT exercise if blood sugars are above 250 mg/dl
- Avoid hypoglycemia (low blood sugars)
Type 2 Diabetes Mellitus (DM)

- Characteristics and related risks
  - Insulin resistance and deficiency
    - *May or may not require daily insulin therapy*
  - 90-95% of all diagnosed cases
    - 80% are obese
  - Hispanic and African Americans have increased risk
  - Older age
    - *Non-obese individuals too*
  - Family history
  - History of gestational diabetes
  - Lack of physical activity
Disease cannot be reversed, must be managed

- Goal is to regulate blood glucose

- Changes for a lifetime
  - Nutrition therapy
  - Medications
  - Exercise
  - Blood glucose monitoring
  - Self management education
    - *Foot care, vision checks, infection control*
Other common diseases or situations related to nutrition

- Female Athlete Triad
- Bulimia Nervosa
- Anorexia Nervosa
- Post Traumatic Stress Disorder (PTSD)
- Bone breaks
- Sprains
- Tears
- Gestational diabetes
- Celiac disease
- Gunshot wounds to stomach/intestines
- Burns require nutrition therapy for healing
- Amputation
- Depression
- Traumatic Brain Injury (TBI)
Discussion