Lifestyle Medicine: University of South Carolina School of Medicine Greenville 2018 Updates

Tuesday, February 19, 2019  2:00 PM ET

**Guest Speaker:**

**Jennifer Trilk, PhD, FACSM**  
Aspen Health Innovator Fellow  
Associate Professor: Biomedical Sciences  
Co-Founder/Co-Director: Lifestyle Medicine Education Collaborative (LMEd)

The University of South Carolina School of Medicine Greenville (UofSC Medical School Greenville) requires all matriculating medical students to become educated in Lifestyle Medicine (LM), called the “Core Program,” to improve patient care for the prevention and treatment of lifestyle-related noncommunicable chronic diseases (NCDs). The UofSC Medical School Greenville also offers the *Lifestyle Medicine Distinction Track (LMDT)*. Competitive students who enter the LMDT, train beyond the core program to become LM frontline advocates for healthy lifestyle behaviors in their patients and communities. Learn more about the [Lifestyle Medicine program at UofSC Medical School Greenville](UofSC Medical School Greenville) in this webinar.
FOCUS AREAS
Educational Resources
Champions of Change
Policy Advocacy
Standardized Assessments

AUDIENCE
Medical and Allied Professionals
Premedical bachelors
Medical Schools
Residencies
Medical Professionals in Practice

www.LifestyleMedicineEducation.org
Email: info@LifestyleMedicineEducation.org
Overview

1. Rationale for Lifestyle Medicine in Medical Education
2. USCSOMG Lifestyle Medicine Core Program
   - Required by All Matriculating Medical Students
   - Examples of LM in Biomedical Science and Family Medicine Clerkship courses
3. New 2017: Lifestyle Medicine Distinction Track
   - Competitive Honors Track—5 students per year
4. Classroom to Community: Exercise is Medicine Greenville, Culinary Medicine
5. Questions
Chronic Diseases: The Leading Causes of Death and Disability in the United States

Chronic diseases and conditions—such as heart disease, stroke, cancer, type 2 diabetes, obesity, and arthritis—are among the most common, costly, and preventable of all health problems.

- As of 2012, about half of all adults—117 million people—had one or more chronic health conditions. One in four adults had two or more chronic health conditions.¹

  - Seven of the top 10 causes of death in 2014 were chronic diseases. Two of these chronic diseases—heart disease and cancer—together accounted for nearly 46% of all deaths.²
  - Obesity is a serious health concern. During 2011–2014, more than one-third of adults (36%), or about 84 million people, were obese (defined as body mass index [BMI] ≥30 kg/m²). About one in six youths (17%) aged 2 to 19 years was obese (BMI ≥95th percentile).³
  - Arthritis is the most common cause of disability.⁴ Of the 54 million adults with doctor-diagnosed arthritis, more than 23 million say they have trouble with their usual activities because of arthritis.⁵
  - Diabetes is the leading cause of kidney failure, lower-limb amputations other than those caused by injury, and new cases of blindness among adults.⁶

Health Risk Behaviors that Cause Chronic Diseases

Health risk behaviors are unhealthy behaviors you can change. Four of these health risk behaviors—lack of exercise or physical activity, poor nutrition, tobacco use, and drinking too much alcohol—cause much of the illness, suffering, and early death related to chronic diseases and conditions.

- In 2015, 50% of adults aged 18 years or older did not meet recommendations for aerobic physical activity. In addition, 79% did not meet recommendations for both aerobic and muscle-strengthening physical activity.²

  - More than 1 in 3 adults (about 92.1 million) have at least one type of cardiovascular disease.³ About 90% of Americans aged 2 years or older consume too much sodium, which can increase their risk of high blood pressure.²
The Cost of Chronic Diseases and Health Risk Behaviors

In the United States, chronic diseases and conditions and the health risk behaviors that cause them account for most health care costs.

- Eighty-six percent of the nation’s $2.7 trillion annual health care expenditures are for people with chronic and mental health conditions. These costs can be reduced.12

- Total annual cardiovascular disease costs to the nation averaged $316.1 billion in 2012-2013. Of this amount, $189.7 billion was for direct medical expenses and $126.4 billion was for lost productivity costs (from premature death).18
- Cancer care cost $157 billion in 2010 dollars.12
- The total estimated cost of diagnosed diabetes in 2012 was $245 billion, including $176 billion in direct medical costs and $69 billion in decreased productivity. Decreased productivity includes costs associated with people being absent from work, being less productive while at work, or not being able to work at all because of diabetes.20
- The total cost of arthritis and related conditions was about $128 billion in 2003. Of this amount, nearly $81 billion was for direct medical costs and $47 billion was for indirect costs associated with lost earnings.21
- Medical costs linked to obesity were estimated to be $147 billion in 2008. Annual medical costs for people who were obese were $1,429 higher than those for people of normal weight in 2006.22
- For the years 2009–2012, economic cost due to smoking is estimated to be at least $300 billion a year. This cost includes nearly $170 billion in direct medical care for adults and more than $156 billion for lost productivity from premature death estimated from 2005 through 2009.12
- The economic costs of drinking too much alcohol were estimated to be $249 billion, or $2.05 a drink, in 2010. Most of these costs were due to binge drinking and resulted from losses in workplace productivity, health care expenses, and crimes related to excessive drinking.23
## 2013 Greenville County Obesity Fact Sheet
### Nutrition, Physical Activity, and Obesity

### Physical Inactivity Cost:
- Total Estimated County: $707,888,296
- Total Estimated State: $503,470,671
- Total Estimated United States: $75 billion

### Estimated Economic Cost of Physical Inactivity per Adult (Age 18+) Annually in 2013

<table>
<thead>
<tr>
<th>Physical Inactivity</th>
<th>Greenville County</th>
<th>SC</th>
<th>US</th>
<th>HP 2020 Objectives</th>
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<tr>
<td>15.1</td>
<td>14.9</td>
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<td>31.1</td>
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<td>48.6</td>
<td>41.1</td>
<td>49.9</td>
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</table>

Source: www.sboe.org/costcalc/sponsor-partner.asp
Obesity Prevalence Among Children\(^1\) (Age 2-17) and Adults\(^1\) (Age 18+) in 2013

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Children</th>
<th>Adults</th>
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<tbody>
<tr>
<td>Greenville County</td>
<td>16.9</td>
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<tr>
<td>South Carolina</td>
<td>16.7</td>
<td>31.8</td>
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<tr>
<td>United States</td>
<td>29.4</td>
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</table>

Percentage of Children\(^1\) (Age 2-17) and Adults\(^1\) (Age 18+) who Consume less than one serving of Fruits or Vegetables Daily in 2013

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Child Fruit</th>
<th>Child Vegetable</th>
<th>Adult Fruit</th>
<th>Adult Vegetable</th>
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<tbody>
<tr>
<td>Greenville County</td>
<td>5.5</td>
<td>6.3</td>
<td>44.9</td>
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<tr>
<td>South Carolina</td>
<td>5.5</td>
<td>6.2</td>
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<td>27.3</td>
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<tr>
<td>United States</td>
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<td></td>
<td>37.7</td>
<td>22.6</td>
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</table>

\(^1\)County-level estimates were based on synthetic estimates by using county-level demographic data combined with South Carolina overweight and obesity, physical activity and fruit and vegetable consumption prevalence values for children using the South Carolina Children’s Health Assessment Survey (CHAS). For adults, estimates were based on Behavioral Risk Factor Surveillance Survey (BRFSS) sampling region estimates instead of state level estimates. For more information, please visit http://www.childhealthdata.org/docs/nch-docs/local-use-of-state-data-and-synthetic-estimates.pdf.

\(^2\)For South Carolina, data from CHAS, ages 2-17.

\(^3\)Healthy People (HP) provides science-based, 10-year national objectives for improving the health of all Americans. HP has established benchmarks for these objectives and monitored progress over time. For more information, please visit www.healthypeople.gov.

\(^4\)HP 2020 goal for ages 2-19 obesity prevalence.

\(^5\)Data from BRFSS.

\(^6\)BMI is calculated by dividing weight (kg) by height\(^2\) (m).

\(^7\)The physical activity recommendation for adults is at least 150 minutes per week of moderate-intensity, or 75 minutes per week of vigorous-intensity aerobic physical activity or a combination of the moderate and vigorous-intensity physical activity.

\(^8\)These one-year estimates are best used when analyzing large populations and are less reliable than multiple year estimates.

Even with this limitation, the estimates of obesity burden are useful for understanding the magnitude of a public health burden.
Diabetes is the seventh leading cause of death in South Carolina, claiming 1,186 lives in 2012.

The total direct costs of hospitalizations and emergency room visits in Greenville County were over $4.7 billion in 2012.
LIFESTYLE MEDICINE

Lifestyle medicine is an evidence-based approach to preventing, treating and even reversing diseases by replacing unhealthy behaviors with positive ones — such as eating healthfully, being physically active, managing stress, avoiding risky substance abuse, adequate sleep and having a strong support system.

6 WAYS TO TAKE CONTROL OF YOUR HEALTH

NUTRITION
Food trumps all. Choose whole, plant-based foods that are fiber-filled, nutrient dense, health-promoting and disease-fighting! Consider veggies, fruits, beans, lentils, whole grains, nuts and seeds as your dietary ‘North Star.”

EXERCISE
Regular and consistent physical activity that can be maintained on a daily basis throughout life—walking, gardening, push ups and lunges—is an essential piece of the optimal health equation.

TOBACCO
The well-documented dangers of tobacco use include an increased risk of many cancers, heart disease and chronic obstructive pulmonary disease (COPD). Cessation counseling combined, when necessary, with medications, helps patients successfully quit the habit.

SLEEP
Lack of, or poor quality, sleep can lead to decreased ability to recover from illness, a strained immune system and chronic disease. Lifestyle medicine identifies dietary, environmental and coping behaviors to improve sleep health.

RELATIONSHIPS
Social connectedness is essential to our emotional resiliency and overall health. Studies show that isolation and loneliness are associated with increased mortality and morbidity, especially among individuals already diagnosed with lifestyle-related conditions.

STRESS MANAGEMENT
Stress can either lead to improved health and productivity — or to anxiety, depression, obesity, immune dysfunction and poor health outcomes. Helping patients recognize negative stress responses, leading to coping mechanisms and stress reduction techniques leads to improved health and wellbeing.

LIFESTYLE MEDICINE FOCUSES ON 6 AREAS TO IMPROVE HEALTH

HEALTHFUL EATING
of whole, plant-based food

INCREASE PHYSICAL ACTIVITY

DEVELOP STRATEGIES TO MANAGE STRESS

CESSION OF TOBACCO

FORM & MAINTAIN RELATIONSHIPS

IMPROVE YOUR SLEEP

AMERICAN COLLEGE OF LIFESTYLE MEDICINE
The Foundational Components of Lifestyle Medicine

Molecular and Cellular Foundations of Medicine
GMEDG620

Jennifer Trilk, Ph.D, FACSM
9.20.18
1-3:00pm
Macronutrients

- Carbohydrates
  - 4kcal/g
- Fats
  - 9kcal/g
- Proteins
  - 4kcal/g

- 50-60%CHO/15-25%PRO/10-30%FAT

- If eating 2500 kcal/day, and receiving 20% protein, how many kcal of protein? How many grams of protein?
  - 500 kcal
  - 125 g
Vitamin classification 
(From Dr. Blenda)

Vitamins

Water soluble

Non-B complex
Ascorbic acid (vitamin C)
Broccoli, Brussels sprouts, cauliflower, green and red peppers, spinach, cabbage, turnip greens, and other leafy greens, sweet and white potatoes, tomatoes and tomato juice, winter squash.

B Complex
Energy releasing
Thiamine (vitamin B₁)
Riboflavin (vitamin B₂)
Niacin (vitamin B₃)
Biotin
Pantothenic acid

Hematopoietic
Folic acid
Vitamin B₁₂

Other
Pyridoxine (vitamin B₆)
Pyridoxal
Pyridoxamine

B1 (Thiamine): beef, liver, dried milk, nuts, oats, oranges, pork, eggs, seeds, legumes, peas and yeast
B2 (Riboflavin): beef, liver, milk, yogurt, mushrooms, spinach, almonds, tomatoes
B3 (Niacin): mushrooms, potatoes, oatmeal, cottage cheese, milk, soy, beef, liver, animal proteins
Biotin: Spinach, sweet potato, mushrooms, cauliflower, almonds, eggs
Pantothenic Acid: sweet potatoes, yogurt, legumes, mushrooms, egg yolk
Folic Acid: leafy greens (spinach, kale), beans, citrus fruits
B12: naturally found in all animal products and not present in plant foods (fortified cereals)
B6: beans, nuts, seeds, soy, legumes, animal products

Fat soluble

Vitamin A (retinol, β-carotenes)
Vitamin D (cholecalciferol)
Vitamin K (phyllloquinones, menaquinones)
Vitamin E (tocopherols)

A: liver/fish oil, green leafy, red veg
D: 15-30 min of sunlight, fatty fish
E: wheat germ oil, sunflower seeds, almonds
K: Broccoli, Brussels sprouts, kale, beef liver

Fats and Cholesterol

**FATS: THE GOOD, THE BAD & THE UGLY**

**GOOD**
- Monounsaturated & Polyunsaturated Fats
  - Can lower bad cholesterol levels
  - Can lower risk of heart disease & stroke
  - Can provide essential fats that your body needs but can’t produce itself

**BAD**
- Saturated Fats
  - Can raise bad cholesterol levels
  - Can raise good cholesterol levels
  - Can increase risk of heart disease & stroke

**UGLY**
- Hydrogenated Oils & Trans Fats
  - Can raise bad cholesterol levels
  - Can lower good cholesterol levels
  - Can increase risk of heart disease & stroke
  - Can increase risk of type 2 diabetes

**SOURCE**
- Monounsaturated fats come from animal sources, including meat and dairy, and from tropical oils
- Saturated fats: Plant-based liquid oils, nuts, seeds, and fatty fish
- Hydrogenated oils & trans fats: Processed foods made with partially hydrogenated oils

**EXAMPLES**
- Avocados, fish, nuts and seeds
- Beef, pork, chicken fat, butter
- Partially hydrogenated oils, some baked goods

**American Heart Association Recommendation**
- Eat a diet that:
  - Includes GOOD FATS (nuts, seeds, fatty fish, non tropical oils)
  - Limits saturated fats to no more than 5-6% of calories
  - Keeps trans fats as LOW as possible
Definitions of Movement

• **Physical activity (PA):**
  – Any bodily movement produced by skeletal muscles that increases energy expenditure (gardening, walking/cycling for transport, manual labor)

• **Exercise:**
  – Planned and structured repetitive movements designed specifically to improve fitness and health

• **Sport:**
  – Physical activity which involves structured competitive situations governed by rules

• **Physical fitness:**
  – A set of attributes such as stamina, mobility, and strength that relate to ability to perform physical activity

• **Cardiorespiratory fitness:**
  – The ability of the body's circulatory and respiratory systems to supply fuel and oxygen during sustained physical activity.
The F.I.T.T Principle
(or what you would use as your exercise prescription)

- The F.I.T.T. Principle is one of the foundations of exercise, a set of guidelines that help you set up a workout routine to fit your goals and fitness level while helping you get the most out of your exercise.

- F: Frequency
- I: Intensity
- T: Time
- T: Type
No lower threshold for benefit

Steep early slope

No upper threshold

No obvious best amount

Consistent reduction in diseases with greater ‘dose’.

“Cura te ipsum (Heal thyself)”

Student-led organic garden, “Medical Roots: Harvesting Health and Hope”
LM Learning Objective #3: 
Demonstrate a personal commitment to healthy lifestyle choices

Set your Goal with measurable outcomes

- Examples: (These are brief examples. Your description should be more detailed and include the process you will use to meet the goal.)
  - **Goal**: Increase fruit and vegetable consumption to 5 servings a day (Goal: Diet/Nutrition) You should include a plan of what fruits and vegetables you will purchase and when you will eat them. Data: Keep a log of daily fruit and vegetable intake.
  - **Goal**: Engage in 30 minutes of moderate physical activity each day (Goal: Physical Activity) You should include a plan for the type of activity you will do and when you will do it. Data: Keep a log of daily physical activity.

CANVAS EMAIL TO DR. TRILK, PLEASE!
Medical Student VO\textsubscript{2}\text{max} Testing
Obesity, BMI, and Body Composition

Structure and Function II
GMEDG635

Jennifer L. Trilk, PhD
1/21/14
9:00– 10:00am
Quantifying Adipose tissue via Dual X-ray Aborptiometry (iDXA)

http://windinmyface.com/dexa-bmi.html
Obesity-Chronic Inflammation-Disease Association

Accumulation of Body Fat Leads To:
- Atherosclerosis, CVD
- Excessive production of fibrinogen (and clotting)
- Liver disease
- Development of insulin resistance and type 2 diabetes
- Other obesity-related research:
  - COPD, tumor cell growth and proliferation, cancer (colon, breast, and lung), neurodegeneration (Alzheimers, Parkinson’s, Dementia)

All linked via cellular to organ pathogenesis that includes chronic inflammation

Full body MRI scans:
2 women–
- 5'6" and 250 lbs
- 5'5" and 120 lbs

National Geographic Pictures of the Year 2004
Lifestyle and the Pancreas

GI and Hepatic Systems
GMEDG685

Jennifer L. Trilk, PhD
12/10/14
1:00– 3:00pm
Exercise Improves Glucose Uptake
Exercise Improves Glucose Uptake
In Class Questions

• How does an increase in skeletal muscle triglycerides (intramyocellular lipid content), diacylglycerols (DAG), and FFAs lead to inhibition of glucose entry into the cell?
In Class Questions

• How does an increase in skeletal muscle triglycerides (intramyocellular lipid content), diacylglycerols (DAG), and FFAs lead to inhibition of glucose entry into the cell?
Lifestyle Medicine and the Immune System

Defenses and Responses
GMEDG650_16
Co-morbid case
A 44-year-old woman presents to you, her primary care physician, for her annual exam. She explains that she is feeling sluggish, not sleeping well, and having headaches. She has gained 19 pounds since last year’s visit. You notice that she has gained a significant amount of weight around her midsection (visceral adipose tissue). The woman also had gestational diabetes during pregnancy with her daughter who is now 7 years old. You perform a H and P and order labs.

Vital signs:
Blood pressure 138/86 mmHg
Pulse 76 bpm
Respirations 28
Exercise Vital Sign: 60 min/week

Social History:
Social drinker: Sometimes of one glass of wine on weeknights, 2-3 on Saturday nights.
No illicit drug use
Diet is fair to poor – eats fried foods, and foods high in saturated fat (“meat and potatoes”) diet; few vegetables, very little fruit.
2 cups of coffee per day in the morning
Works full-time as an Administration Assistant at a mortgage firm

Height: 5 ft. 6 inches
Weight: 210 lb
BMI = (calculate)

Fasting Labs:
HbA1c = 5.8%
Blood glucose = 137 mg/dl
TC = 218 mg/dl
TRIGS = 159 mg/dl
HDL = 40 mg/dl
LDL = 178 mg/dl
CRP = 2.4 mg/L

Co-morbid case continued...
You counsel her on the importance of adopting a physically-active lifestyle with a goal of improving her nutrition and losing at least 10% of her body weight. You refer the woman to the YMCA for the Exercise is Medicine program. You continue to see her every 2 months over a 6 month period. The woman diligently sticks to her exercise and nutrition program for 6 months. At 6 months, you perform a physical and order labs.

Vital signs:
Blood pressure 118/72 mmHg
Pulse 68 bpm
Respirations 28
Exercise Vital Sign: 300 min/week

Height: 5 ft. 6 inches
Weight: 160 lb
BMI = (calculate)

Fasting Labs:
HbA1c = 4.9%
Blood glucose = 75 mg/dl
TC = 196 mg/dl
TRIGS = 124 mg/dl
HDL = 52 mg/dl
LDL = 144 mg/dl
CRP = 1.2 mg/L
Excessive caloric consumption and sedentary lifestyle promotes adipocyte hypertrophy and the *pro-inflammatory phenotype* of adipose tissue.

- Inflamed adipose tissue produces and releases Leptin, M1-type macrophages, TNF, TLR expression, macrophage-derived IL-6*, liver-derived CRP, other pro-inflammatory cytokines.
Multisystem Function: Step 1 Prep

Endo Repro

Jennifer L. Trilk, PhD
William Roudebush, PhD
Renee Chosed, PhD
2/19/19
10:00–12:00pm
MDL
Case Study: Precocious Puberty

• A 7-year-old girl is brought to Department of Pediatrics for breast development and excessive vaginal discharge. Her medical history and family history are unremarkable.

• Examination of breast reveal *enlargement of both breasts* (Tanner stage III breast development) and firm in consistency. *Nipple and areola are developed. Axillary and pubic hair present* but sparse. Abdominal examination no palpable lump present.

• Pelvic ultrasound shows *uterus* enlarged for age, thickened endometrium and both ovaries *almost adult size*.

• No history of birth injury, head injury, encephalitis, headache or seizures. MRI scan is *NFS of lesions in hypothalamus, pituitary, or ventricles*. Adrenal function testing was unremarkable.
Concept Map Group Work

- Use a concept map to link how lifestyle factors can contribute to precocious puberty. Link the relevant lifestyle factors from the case with hormone/endocrine/biochemical effects as well as long-term consequences.

<table>
<thead>
<tr>
<th>Lifestyle Factors</th>
<th>Hormones/Endocrine</th>
<th>Biochemistry</th>
<th>Consequences</th>
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<tbody>
<tr>
<td>Physical Inactivity</td>
<td>Insulin</td>
<td>Fatty acid synthesis</td>
<td>Precocious Puberty</td>
</tr>
<tr>
<td>“Calorie rich-nutrient poor” diet</td>
<td>Leptin</td>
<td>Beta-oxidation</td>
<td>PCOS</td>
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<td>Psychosocial Factors</td>
<td>Hypothalamus-Pituitary-Ovary axis</td>
<td>Ketones</td>
<td>Breast Cancer</td>
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<tr>
<td>Obesity</td>
<td>Adiponectin</td>
<td>JAK-STAT</td>
<td>Infertility</td>
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<td>GnRH</td>
<td>MAP kinase</td>
<td>Metabolic syndrome</td>
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<td>Cyclins</td>
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<td></td>
<td>Aromatase</td>
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<td>Obesity</td>
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<td>Cell cycle</td>
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Fatty acid synthesis
Beta-oxidation
Ketones
Adipocytes
JAK-STAT
MAP kinase
Cyclins
Cell proliferation
Cell cycle
Estrogen receptor
Epigenetics
Xenoestrogens
Lifestyle Medicine and Brain Health
Mind, Brain, and Behavior
(GMEDG 640)

Jennifer L. Trilk, PhD
Lauren Fowler, PhD
9.21.18
8:00-8:50am
One night’s sleep deprivation led to the following:

- Inflammation across tissues
- Adipose tissue attempting to increase its capacity to store fat (hypertrophy)
- Breakdown of skeletal muscle proteins (catabolism)
Lifestyle and Cancer

Hematology/Oncology
GMEDG675

Jennifer L. Trilk, PhD
Elizabeth Morris, MD
8/25/16
9:00-11:00am
Fig. 1. The role of genes and environment in the development of cancer. A The percentage contribution of genetic and environmental factors to cancer. The contribution of genetic factors and environmental factors towards cancer risk is 5–10% and 90–95% respectively. B Family risk ratios for selected cancers. The numbers represent familial risk ratios, defined as the risk to a given type of relative of an affected individual divided by the population prevalence. The data shown here is taken from a study conducted in Utah to determine the frequency of cancer in the first-degree relatives (parents + siblings + offspring). The familial risk ratios were assessed as the ratio of the observed number of cancer cases among the first degree relatives divided by the expected number derived from the control relatives, based on the years of birth (cohort) of the case relatives. In essence, this provides an age-adjusted risk ratio to first-degree relatives of cases compared with the general population. C Percentage contribution of each environmental factor. The percentages represented here indicate the attributable-fraction of cancer deaths due to the specified environmental risk factor.
Sitting Time and Mortality from All Causes, Cardiovascular Disease, and Cancer.

KATZMARZYK, PETER; CHURCH, TIMOTHY; CRAIG, CORA; BOUCHARD, CLAUDE


FIGURE 1 - Kaplan-Meier survival curve for all-cause mortality across categories of daily sitting time in 17,013 men and women 18-90 yr of age, in the Canada Fitness Survey, 1981-1993. Log-rank [chi]² = 174.4, df = 4, P < 0.0001. The sample sizes across the categories were 3022 (17.8%), 6652 (39.1%), 4379 (25.7%), 2138 (12.6%), and 822 (4.8%), for the categories of almost none of the time, one fourth of the time, half of the time, three fourths of the time, and almost all of the time, respectively.
N = 38,000 men received VO$_{2\text{max}}$ test and followed from 1974–2003. Kaplan-Meier survival curves for lung cancer mortality by cardiorespiratory fitness (CRF) levels, ACLS, Dallas, Texas.
A Prospective Study of Cardiorespiratory Fitness and Breast Cancer Mortality


N=14,811 women received VO$_2$$_{max}$ test and followed from 1970-2001. Mortality surveillance was completed through December 31, 2003. Survival free of breast cancer across cardiorespiratory fitness (CRF) status.
Cancer Prevention Requires Major Lifestyle Changes

Fig. 4. Cancer deaths (%) linked to diet as reported by Willett (see 35).
Overview of Obesity, Sedentary Behavior and Cancer: Mechanisms
Overview of Obesity, Sedentary Behavior and Cancer: Mechanisms
Why Exercise for Cancer?

- Exercise decreases risk of many types of cancers and *may even be protective against progression of some cancers*

- Maintains or decreases weight, increases lean muscle mass and strength, increases cardiorespiratory and metabolic fitness, decreases risk of osteoporosis, improves fatigue, depression, and anxiety
Lifestyle Medicine in Practice
Clinical Clerkship M3/M4

Jennifer L. Trilk, PhD, Robert Masocol, MD, John Emmerson, MD, Beth Motley, MD
LM Mentors
Family Medicine/Lifestyle Medicine
Clinic/Clerkship

- Patient referred
- MA
  - Vitals
  - WC
  - Questionnaire
- Physician
- Labs, Referrals
- Dietician/nutrition
  - Cooking classes x 2 per month
  - Shopping
- Behavioral change
  - Health and wellness Coach
- Exercise is Medicine
  - YMCA, GHS Life Center

*Slide used with permission of Dr. Robert Masocol*
Lifestyle Medicine

The Lifestyle Medicine Distinction Track prepares future physicians to become frontline advocates for healthy lifestyle behaviors in their patients and communities through the effective application of Lifestyle Medicine principles. Students will also learn how to effectively use evidence-based Lifestyle Medicine to prevent and treat chronic diseases that include obesity, type 2 diabetes, hypertension, cardiovascular disease and some forms of cancer.
Lifestyle Medicine Distinction Track

M1: Begin Journey

Outside Collaboration

Graduation:
LM Certificate
Dean’s Letter

Residency Training

Mapping and Assessment

Innovative content

Community engagement

Networking Resources Fellowship

Jerry Youkey, M.D. and Jennifer L. Triki, PhD; contributions from Ann Blair Kennedy, DrPH
Lifestyle Medicine Distinction Track Mentors

Jennifer L. Trilk, Ph.D.
- LMDT Director
- Lifestyle Medicine

Phyllis MacGilvray, MD
- Family Medicine

Meenu Jindal, M.D.
- Internal Medicine

John F. Emerson, M.D.
- Lifestyle Medicine
- Sports Medicine
- Family Medicine Clinical Clerkship Director

Robert Masocol, MD, Board Certified Lifestyle Medicine
- Director, Lifestyle Medicine Clinic
- Family Medicine

Elizabeth Morris, M.D., Board Certified Lifestyle Medicine
- Plant-based Nutrition
- Greenville Family Medicine

Thomas Nathaniel, Ph.D.
- Associate Professor
- Stroke Prevention

Matthew Tucker, PhD
- Assistant Professor
- Sleep Hygiene
Lifestyle Medicine Distinction Track Curriculum Overview

M1: “Cura te ipsum”
- Culinary Medicine (summer)
- GHS Business Health
- Harvesting Health and Hope
- Plan Classroom to Community Research Project
- Journal Club (monthly)

M2: Classroom-to-Community
- Continue GHS Business Health
- Continue CM (monthly)
- Implement C2C Research Project
- Journal Club (monthly)

M3: Lifestyle Medicine Best Practices
- Continue GHS Business Health
- 30-hour ACLM/ACPM Online LM Core Competency Program
- 1x Peer-to-Peer Teaching
- 2 week LM Elective (FM)
- Teach CM to NCD Patients
- Submit C2C Research project
- Journal Club (quarterly)

M4: Scholarly Activity
- Final GHS Business Health
- Present the Research Project (C2C) Paper/poster at regional/national conference
Chef Alan Scheidhauer C.E.C
Department Head Culinary Arts

Faculty: Chef Scott Roark
Chef Instructor

Staff: Christine Gerrard
Hospitality Purchasing Instructor

www.gvltec.edu/culinary_institute
CULINARY MEDICINE PROGRAM
SUMMER CALENDAR 2018: 9am – 1pm, T/Th

May 31—Safety & Sanitation Module
June 5—Module 1: Introduction to Culinary Medicine
June 7—Module 2: Weight Management & Portion Control
June 12—Module 3: Fats
June 14—Module 4: Food Allergy & Intolerance
June 19—Module 5: Protein, Amino Acids, Vegetarian Diets, Eating Disorders
June 21—Module 6: Sodium, Potassium, and Hypertension
June 26—Module 7: Carbohydrates
July 10—Module 8: The Pediatric Diet
July 12—Project Module

Fall Calendar 2018—1 Afternoon/Week; Dates TBD
Module 9: Sports Nutrition
Module 10: Cancer Nutrition
Module 11: Nutrition in Pregnancy
Module 12: Diabetes & Hypertension in Pregnancy
Module 13: Celiac Disease
Module 14: Food Allergy
Module 15: Food & Neurocognition
Module 16: Anti-Inflammatory Diet
Module 17: IBS IBD GERD
Program Providers

GREENVILLE HEALTH SYSTEM
YMCA OF GREENVILLE

Academic & Research Providers

UNIVERSITY OF SOUTH CAROLINA
School of Medicine
Greenville

UNIVERSITY OF SOUTH CAROLINA
Arnold School of Public Health

http://eimgreenville.org/
Exercise is Medicine® Greenville is proud to offer a 12 week program for adults that engage in less than 150 minutes of physical activity per week and are looking to get healthy and make a positive impact on their own health. The program includes 60 minute classes that meet twice a week and are led by an EIM professional. An EIMG membership and access to the assigned location is included.

Who?
- Patients engaging in <150 mins/wk of physical activity
- Patients motivated to participate and willing to commit to lifestyle change
- Patients with low risk chronic conditions (Patients identified with high risk conditions may be referred to clinical rehabilitation programs)
- Healthy adults with abnormal BMI

How?
- Request a referral from your GHS Provider
  (Provider must review risk factors and co-morbidities for appropriate referrals)

Where?
This program is available at the following locations:
- GHS Life Center
- Caine Halter Family YMCA (Downtown)
- Eastside Family YMCA (Taylor's)
- GHS Family YMCA (Simonsville)
- George I. Thelmon Family YMCA (Travelers Rest)

Cost?
- $199 for 12 weeks
  (Financial assistance available based on income)

Exercise is Medicine® Greenville is a health program designed to improve the health and well-being of people in our community through a prescription of physical activity, lifestyle changes and education from area healthcare providers.

Physical inactivity is a major health problem and contributes to a variety of disease and health concerns, including obesity, heart disease, high blood pressure, diabetes, and much more. However, consistent physical exercise has proven to be effective in the treatment and prevention of chronic disease.

Greenville Health System, in partnership with the YMCA of Greenville, the USC School of Medicine Greenville and the American College of Sports Medicine, offers the Exercise Is Medicine Greenville program to reduce or slow, stop and reverse the progression of chronic diseases.

Program Components
- Directed 60-minute exercise sessions twice per week for 12 weeks with a trained Exercise is Medicine credentialed professional.
- Unlimited access to fitness facility throughout the duration of the program participation.
- Two physical activity modules based on disease-specific diagnosis:
  - Cardiometabolic Module
  - Musculoskeletal Module
- Healthy Lifestyle education
- Pre/post assessments
- Program participation and results documented in individual electronic health records (EHR).

How to Participate
A physician referral is required at this time to participate in EIMG. Ask your healthcare provider to refer you to the Exercise Is Medicine Program. Once referred, you will be contacted by a referral coordinator to schedule your initial EIMG appointment.

“The Exercise is Medicine Greenville program helped me a lot. It helped with my weight and self-esteem. More than anything, it motivated me to focus on me.”
- Debra/EIMG pilot program patient
The Power of Physician Referral: 
Exercise is Medicine® Greenville Program

Six GHS/YMCA-Designated Places, >30 Credentialed Professionals
Implementation: 2016-2017

• August 2016 Launch of EIM Greenville® and Press Release
  – 4 Practices (2 Internal Medicine, 2 Family Medicine)
• Scale through 2017-2019
  – Systematically adding practices as requested
• Development and Dissemination of EIMG® Toolkit
Participating Partners as of 2018

Internal Medicine Clinic
Center for Family Medicine
Greenville Family Medicine
Family Medicine Mountain View
Cross Creek Internal Medicine
Internal Medicine Associates
Bariatric Solutions
Steadman Hawkins Greer
Center for Integrative Oncology & Survivorship
Travelers Rest Family Medicine
Diabetes Prevention Program
....more onboarding this year......
### August 2018 Referrals:

<table>
<thead>
<tr>
<th>Practice</th>
<th>August 2018 Referrals</th>
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<tbody>
<tr>
<td>CFM</td>
<td>6</td>
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<tr>
<td>IMC</td>
<td>8</td>
</tr>
<tr>
<td>FM Mtn. View</td>
<td>2</td>
</tr>
<tr>
<td>IMA</td>
<td>3</td>
</tr>
<tr>
<td>Greenville FM</td>
<td>6</td>
</tr>
<tr>
<td>Bariatric</td>
<td>15</td>
</tr>
<tr>
<td>SHCC</td>
<td>--</td>
</tr>
<tr>
<td>Cross Creek</td>
<td>3</td>
</tr>
<tr>
<td>CIOS</td>
<td>3</td>
</tr>
<tr>
<td>Traveler’s Rest FM</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes Prevention Program</td>
<td>--</td>
</tr>
</tbody>
</table>

**Total # Referrals**: 48

- Correct At Month End: 37 (79%)
- Missing Elements Initially: 16 (34%)
- Missing Elements At Month End: 6 (13%)
- Inappropriate: 4 (8%)
- Outside: 1 --
## Scholarship & Full Pay Data

<table>
<thead>
<tr>
<th>Total Amount of Scholarship Provided</th>
<th>% Increase by Year</th>
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</thead>
<tbody>
<tr>
<td>January 1 – September 30, 2018</td>
<td>$6,766.00</td>
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<tr>
<td></td>
<td>184%</td>
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<tr>
<td>January 1 – December 31, 2017</td>
<td>$3,686.00</td>
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<td></td>
<td>240%</td>
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<td>August 1 – December 31, 2016</td>
<td>$1,537.00</td>
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<tr>
<td>Total Amount of Non-Scholarship Revenue*</td>
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<td>January 1 – September 30, 2018</td>
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<td>322%</td>
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<tr>
<td>January 1 – December 31, 2017</td>
<td>$1,791.00</td>
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<td>225%</td>
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<tr>
<td>August 1 – December 31, 2016</td>
<td>$796.00</td>
</tr>
</tbody>
</table>
2018 EIMG® Graduates Data (n=65; * denotes p< 0.05)

**Weight**

- Pre
- Post

**Systolic Blood Pressure**

- Manual
- Automated
- Combined

**Diastolic Blood Pressure**

- Manual
- Automated
- Combined
2018 Started EIMG® with Hypertension (>130/>80; n=45; *denotes p< 0.05)
Outcomes and Testimonials

Blood pressures decreased, small but significant change in body weight. Patients stay with program and love their professionals.

- “I am disabled and on a fixed income. Exercise is Medicine offers so much more than the typical physical rehab clinic. I was paired with Paulo, and I have never received this kind of personal attention. Paulo is a genius at what he does and seems to be born for the task at hand. I highly recommend EIM and Paulo to instruct you.
  --45-year old male disabled patient, IMC referral

- “After six weeks of hard work and reaching the half-way point, one of my EIM patients has seen huge results not only physiologically, but physically as well. She has reduced her resting blood pressure from 178/109 on her first session, to 129/94 since her last session. Additionally, she has lost a total of 15 pounds. This is all due to proper dieting and exercising.’’
  --Billy Serrao: BS, EP-C, EIM-L2, CSCS, CF-L1, PWR!, Wellness Specialist
Buy-In: Hospital System and Community

• Patients score program 5 out of 5 for patient satisfaction
• Continually contacted by national health care systems, eager to know process of implementing EIMG® into their systems
• EIMG® is recognized system-wide and throughout our community
• Enormous community support; “40Men4Change” raised $$ for 385 GHS Patients
Using Lifestyle Medicine in U.S. Health Care to Treat Obesity: Too Many Bariatric Surgeries
Jennifer L. Titus, PhD and Ann Blake Kennedy, LMT, DPTCN

Abstract
More than one in four Americans are classified as obese. Many obese patients perform basic surgery (BBS) when it is a safe and effective therapy to control weight and improve health. The goal of this study was to assess the medical necessity of bariatric surgery. We performed a retrospective analysis of medical records of all patients who underwent bariatric surgery at a large academic medical center in the United States. The results showed that bariatric surgery was performed in patients with obesity and comorbidities such as Type 2 diabetes, hypertension, and obesity-related sleep apnea. The study concluded that bariatric surgery is a safe and effective therapy for patients with obesity and comorbidities.

Advancing Lifestyle Medicine Education in Undergraduate Medical School Curricula Through the Lifestyle Medicine Education Collaborative (LMEC)
Jennifer L. Titus, PhD, Dennis Mazzola, MD, and Tianhui Liu, MD

Introduction
Lifestyle medicine education is crucial for the 21st century physician. In an era of increasing health care costs, there is a need for medical education to focus on prevention and lifestyle medicine. Lifestyle medicine education can help medical students develop skills in patient counseling and lifestyle modification. The Lifestyle Medicine Education Collaborative (LMEC) is a network of medical schools committed to advancing lifestyle medicine education in undergraduate medical curricula.

Chi-Tai and Abdominal Conditions

References
5. American Heart Association. http://www.heart.org/HEARTORG/GettingHealthy/LifestyleChangeStrategies_UCM_300827_Article.jsp
Conclusions

• Future physicians are positioned to stem the tide of chronic diseases
• Must be trained in Exercise and Lifestyle Medicine components to make impact

Thank You!

Website: www.greenvillemed.sc.edu
email: Trilk@greenvillemed.sc.edu

References:
Register for our Next Webinar: **Highlighting “code blue: Redefining the Practice of Medicine”**

With Dr. Saray Stancic, MD

*Stancic Health and Wellness, LLC...a Lifestyle Medicine practice*

**Date:** Tuesday, May 21st, 2019 at 2pm EDT

**LMEd Host:** Eddie Phillips. MD