LFIT FINAL- The Ultimate Study Guide

Ever since Spring '14, students like you have been updating it to reflect the current semester.
Good Luck!

PSA my venmo is james-branley, donations are accepted, tysm

HELPFUL LINKS?

https://quizlet.com/134764127/lfit-flash-cards/

Condensed version of this:
https://docs.google.com/document/d/1HbksGmZzKLinGbeiIo3-g9Bu282CoeYFL1dXTRaLCto/edit?usp=sharing
https://quizlet.com/134344744/lfit-study-guide-final-exam-flash-cards/
^ who is responsible for this me don
't know if i should be impressed or upset
^ i was in the UL and it started playing
^ GOAT
https://www.youtube.com/watch?v=dQw4w9WgXcQ
https://quizlet.com/134344744/lfit-study-guide-final-exam-flash-cards/
it has all the questions from the study guide and its answers
^ bless you child bc i cannot cram all this info

Hey guys i just finished making a quizlet that's super intense for all you hardcore studiers- this has the study guide, the quiz questions from the modules, the important percentages and numbers, definitions, and any extra info from the modules i thought was important:
https://quizlet.com/134764127/lfit-flash-cards/
Password is lfitsucksass

https://quizlet.com/135096688/lfit-final-exam-modulesquizzes-flash-cards/ <- quizlet of all module questions and answers (In order)

Link to another google doc:
https://docs.google.com/document/d/1yjRydKK-aJI7aImli4_YVqrR1w06BTcxvcDzd6N8D4Y/edit
This is dope, thanks - but when am i gonna find the time to cram this meaningless info tho <-SAME. I have more important classes to study for

https://quizlet.com/106527487/lfit-unc-2015-final-flash-cards/

Transtheoretical Model ● ● ●

- **Stages of change to initiate change in behavior**
- **Precontemplation** - In this stage, people do not intend to take action in the foreseeable future (defined as within the next 6 months). People are often unaware that their behavior is problematic or produces negative consequences. People in this stage often underestimate the pros of changing behavior and place too much emphasis on the cons of changing behavior.
- **Contemplation** - In this stage, people are intending to start the healthy behavior in the foreseeable future (defined as within the next 6 months). People recognize that their behavior may be problematic, and a more thoughtful and practical consideration of the pros and cons of

changing the behavior takes place, with equal emphasis placed on both. Even with this recognition, people may still feel ambivalent toward changing their behavior.

- **Preparation (Determination)** - In this stage, people are ready to take action within the next 30 days. People start to take small steps toward the behavior change, and they believe changing their behavior can lead to a healthier life.
- **Action** - In this stage, people have recently changed their behavior (defined as within the last 6 months) and intend to keep moving forward with that behavior change. People may exhibit this by modifying their problem behavior or acquiring new healthy behaviors.
- **Maintenance** - In this stage, people have sustained their behavior change for a while (defined as more than 6 months) and intend to maintain the behavior change going forward. People in this stage work to prevent relapse to earlier stages.
- **Termination** - In this stage, people have no desire to return to their unhealthy behaviors and are sure they will not relapse. Since this is rarely reached, and people tend to stay in the maintenance stage, this stage is often not considered in health promotion programs.
    - **Persians - precontemplation**
    - **Can't - contemplation**
    - **Poop - preparation**
    - **At - action**
    - **My - maintenance**
    - **Toilet - termination**

Previous Essay Topics

How long do the "essays" have to be? I think about a paragraph. My TA said it could be any length, so as long as you answer fully you should be gucci with pretty much anything.

- **What are the 3 macronutrients? What are the recommended intake ranges for each? <-This Seems to be the most common essay for Spring 2016**
    - Carbohydrates (energy for basic metabolic function, fuel for vigorous exercise) – minimum of 130 grams per day (45-65% of daily calories)
    - Proteins (growth/repair of tissue, immune system support, synthesize hormones and enzymes) – 0.4 grams (.8 grams per athlete) per pound of body weight (10 – 35% of daily calories)
    - Fats (energy source) – 20 – 35% of daily calories; saturated fat intake - less than 10% of daily calories
- **SMART goals**
    - Essential for motivating behavioral change
        - Specific - write a "contract" to yourself, show someone to hold you accountable
        - Measureable - quantifiable in someway, but subjective feelings still matter
        - Attainable - do you have the time, commitment, and skills to accomplish your goals?
        - Realistic - make goals challenging, but within reach
        - Time-specific - set realistic deadlines
- **2020 initiative**
    - attain higher-quality and longer lives, w/o death from preventable diseases
    - health equity to improve health of all groups
    - create environments that promote good health for all
    - promote quality of life and healthy behaviors across all life stages.
- **energy systems**
    - Energy systems are the relationship of consuming and burning calories
    - Energy intake > energy output = you'll get fat

    - Energy output > energy intake = you'll lose weight
    - bbnSo it's the total energy expenditure?
- **physical and physiological responses to exercise**
    - Can someone explain this
- **like 3 types of how calories is used and taken up <- huh -what? -EXPLAIN**
- **Macro and Micro-nutrients… what they're used for and daily intake for each**
    - Macro: Carbs Protein Fats.
    - Micro: Vitamins, Minerals, technically Water
    - is that all we should know if the essay is on macro/micronutrients? <-Review the percentages associated with them, how macro/micronutrients are good and bad, etc
- **Total Energy Expenditure** <- This was my essay and I made 1/10. Completely blanked.
    - Energy spent in a typical day
        - Resting metabolic rate- energy expended while at rest (70% TEE)
        - Thermic effect of food- amount of energy required to digest, absorb, and store food (6-10% TEE)
        - Energy expended during physical activity- amount of energy expended associated with physical activity (20% TEE)
    - What does this mean?
    - The whole gain weight things- calories in vs. calories out
- **Transtheoretical Model**
- **the FITTE principle**
    - create a workout plan based on:
    - frequency - how often you exercise
    - intensity - level of demand
    - time - how long
    - type - which exercises
    - enjoyment - you won't exercise if you don't enjoy it

Frequency- number of training sessions in a given time period, usually expressed as per week

- recommended frequency of activity is preferably every day of the week, for small quantities of time
- for improved fitness levels, the frequency is 3 to 5 days per week at higher intensities.

Intensity- level of demand that a given activity places on the body

- for improvements or maintenance in general health, moderate intensity is preferred. Moderate exercise typically represents enough of a demand to increase heart/respiratory rates, but does not cause exhaustion or breathlessness. You should be able to talk comfortably during exercise.
- for improvements in overall fitness and conditioning, higher intensities are generally required
- when beginning a cardio training program, the intensity level should be low-to-moderate to allow your body enough time to adapt and become accustomed to exercise. Gradually work up to 30 to 60 minutes of continuous exercise to help build your aerobic base. Once you can comfortably exercise at this pace for at least 30 minutes 2-3 times per week you'll be ready for higher intensity exercise such as interval training.

Type- mode of activity select

- some examples of modes of exercise include: Running or jogging, Walking, Exercising on cardio equipment, Swimming, Cycling, etc.

Time- amount of time spent exercising each week

- according to the Physical Activity Guidelines for Americans, for health benefits, adults should accumulate 2 hours and 30 minutes of moderate-intensity aerobic activity every week, or 1 hour and 15 minutes of vigorous-intensity aerobic activity every week, or an equivalent mix of moderate- and vigorous-intensity aerobic activity.

Enjoyment- amount of pleasure derived from engaging in a specific exercise or activity.

- Unfortunately, this component of exercise is often overlooked. If the mode of activity is not enjoyable to a person, it is highly likely that he or she will not adhere to the training program. A person is much more apt to continue with a program that is fun and challenging than one that is dull or boring.

Cardiorespiratory training

As with any other form of training, it falls under the principle of specificity. According to the principle of specificity, the body will adapt to the level of stress placed on it and will then require more or varied amounts of stress to produce a higher level of adaptation in the future. Consequently, cardiorespiratory training programs must progress in an organized fashion to ensure continual adaptation while minimizing the risk of overtraining and injury.

Interval training is designed for people with moderate-to-high cardiorespiratory fitness levels and involves varied intensities throughout the workout. Advanced individuals can perform more intense intervals ranging in intensity from three to ten; on a scale of one to ten of perceived exertion. Start with a work-to-rest ratio of 1 to 3 and build to a 1 to 1 ratio.

Circuit Training

- -Another form of cardiorespiratory training; allows for **comparable fitness results without spending extended periods of time to achieve them.**
- -Circuit-training programs consist of a series of strength-training exercises or calisthenics that an individual performs in rapid succession with minimal rest. Circuit training is just as beneficial as traditional forms of low-intensity cardio respiratory exercise for improving or contributing to improved fitness levels.
- -results in higher post-exercise metabolic rates as well as strength levels. In other words, your metabolism is elevated for extended periods following your workout.

*A common myth associated with cardio training intensity is the myth of the fat burning zone. The thought is that people burn more fat at a lower-intensity exercise because such easy work does not require getting energy quickly from carbohydrates is FALSE.

Module 1: Current Health Status and Benefits of Healthy Living

- Identify the top 3 causes of death in the USA. Why is the number of deaths rising due to these diseases? How does diet and lifestyle contribute to the growth of these diseases?
    1. cardiovascular disease
    2. Chronic lower respiratory disease
    3. Cancer

How is obesity defined? What diseases are associated with being overweight and/or obese? What lifestyle changes contribute to weight gain and how can a person overcome obesity?

4. BMI over 30 (BF% >25% males; >30% females)
5. High blood pressure, high cholesterol, cancer, coronary heart disease
6. Exercise and healthy diet

What are some key goals of the Healthy People 2020 initiative and what are the rationales behind these goals?

7. 10-year plan to promote healthy environment for everyone
8. Health equity among all groups
9. Preventable disease-free life
10. Promote quality of life for all ages

Module 2: Health and Fitness Assessments

- What is cardiovascular disease and who does it affect?
    - Any disease affecting the cardiovascular system, such as blood vessels or heart (likely chronic heart disease)
    - Ex: Arrhythmia (irregular heartbeat), coronary heart disease, heart failure, etc.

- This disease affects people who have high blood cholesterol, high blood pressure, people who are overweight, diabetic and people with high stress, smoking, and sedentary lifestyle.
- What is the "silent killer"?: High blood pressure (hypertension)

- Familiarize yourself with cholesterol (know normal values), blood pressure (know normal values), diabetes, and other common diseases in America.
  - Below 200 is healthy (cholesterol)
    - Greater than 40 HDL (high density lipoprotein) GOOD CHOLESTEROL
    - Lower than 130 LDL (low density lipoprotein) BAD CHOLESTEROL
      - Between 130 and 160 LDL sets you at the lowest risk for cardiovascular disease
    - **LDL** cholesterol and **HDL** cholesterol, along with one fifth of your triglyceride
    - level, make up your total cholesterol count.
      - Systolic is less than 120 bpm of mercury (mmHg)
      - Diastolic is less than 80 bpm of mercury
        - 120/80 is normal
      - Common diseases;
        - Diabetes
        - Arthritis
        - Osteoporosis
- What is the recommended amount of physical exercise?
  - 2.5 hours of moderate exercise per week (jogging, walking, etc.)
  - 1.25-1.5 hours of vigorous exercise per week (sprinting, etc.)
  - Muscle strengthening 2+ times a week
- Familiarize yourself with the different fitness assessments and what each one measures. What does a comprehensive fitness assessment involve and what is its role in health management?
  - Sit and reach test
    - Flexibility
  - Strength test
    - Push ups
    - Sit ups
  - 3 minute step test
  - Cardiing 2 or more days a week

ovascular fitness
  - Vertical/long jump
    - power
  - Body composition
    - BMI/BIA (body fat)
  - Heart rate
    - Heart rate measurements before and after 3 minute step test
  - PAR-Q
    - General fitness questionnaire
    - Physical assessment readiness questionnaire
    - Not a replacement for medical exams
  - Posture assessment
    - Deviations in posture, can signal any skeletal distortions
- Body composition can be an indication of risk for certain diseases. How can body composition be used as part of a fitness program?
  - It can be tracked through various methods
    - Underwater weighing

        - Skin- fold Assessment
        - Bioelectrical assessments
- What is BMI?
    - Body mass index
    - (Weight/Height^2) X 703 (lbs/in) or (kg/m)
- What is the difference between overweight and obese?
    - Overweight is a BMI of 25 to 29.9
    - Obesity is greater than 30
- What kind of information is gained from a postural assessment?
    - Deviations in posture
    - Muscles and bones are aligned(Can someone explain this?)- it's just making sure your muscles and bones are where they are supposed to be structurally.
    - Help determine gross deviations in proper posture
        - Optimal length of muscles, optimal recruitment of muscles, optimal joint mechanics, high levels of functional strength
    - Major postural distortions:
        - Pronation distortion syndrome
            - Flat feet
            - Adducted, internally rotated knees (knock knees)
            - Tightness of calves and inner thighs
            - Weakness of outer hip, foot and ankle stabilizers
        - Lower cross syndrome
            - Belt line is higher in back and comes down in front
            - Hyperextended low back
            - Sit for long periods of time; hip flexors are in shortened position and tight
            - Weakness of glutes and abdominals
        - Upper cross syndrome
            - Rounded shoulders, forward head
            - Individuals who sit in front of a computer or drive for long periods of time
            - Tightness in chest and neck muscles
            - Weakness of mid back and rotator cuff
    - Solutions for poor posture
        - Stretch tight muscles, strengthen weak muscles, practice proper posture, avoid repetitive motions, avoid inactivity

Module 3: Nutrition and Supplementation

- What are the 3 macronutrients? What is the recommended intake ranges for each?
    - Protein
        - 10% to 35%
    - Carbohydrates
        - 45% to 65%
    - Fats
        - 20% to 35%
- What are micronutrients?

    Micronutrients are dietary components, often referred to as vitamins and minerals. Water is also technically a micronutrient, I think (water is not a nutrient but essential for survival)
- What are some risks associated with high sugar intake? Risks from high saturated and trans fat intake? What kinds of foods are likely to cause these?
    - High sugar intake- obesity, type II diabetes, liver disease

    - High saturated and trans fat- weight gain, obesity, heart disease
    - Processed foods
- What are potential benefits AND risks associated with dietary supplements?
    - Benefits
        - Help meet nutritional needs
    - Risks
        - Some don't actually produce any benefits, may impose nutrient toxicity
        - Does not act as a replacement for nutrients as real food

Module 4: Weight Control

- A common misconception is that eating fat causes weight gain. What causes weight gain?
    - calories consumed>calories burned
- How does energy balance relate to weight loss?
    - 3 types of daily energy:
        - resting metabolic rate (sitting, walking, typing, sleeping)
        - thermic effect of food (energy received from food)
        - physical activity
    - Fewer calories = weight loss
    - More calories = weight gain
    - Calories burned = calories consumed = maintain weight
- What does the evidence show regarding high protein/low carbohydrate diets?
    - Aren't effective in the long run because they are hard to stick to
    - It is best to stick with a balanced lifestyle between consumption and exercise

Module 5: Behavior Modification

- What are 5 barriers preventing people from beginning an exercise program or engaging in daily physical activity? What is the most cited barrier?
    - Lack of time (Most cited source)
    - Unrealistic goals
    - Lack of convenience
    - Anxiety
    - Poor social network
- Stress
    - Eustress (good) and distress (bad)
    - Prolonged stress leads to depression, fatigue, coronary heart disease, and hypertension
    - Fight or flight is the brain's response to stress
        - Hormones produced by hypothalamus and pituitary gland
        - Alarm → Resistance → Exhaustion
    - Homeostasis
        - Disrupted by stress
        - Body isn't able to function as effectively as possible
- What are some reasons many people have trouble changing unhealthy lifestyle habits?
    - Poor motivation, confidence, competence
- What are SMART goals? Essential for motivating behavioral change
    - Specific
    - Measureable
    - Attainable
    - Realistic
    - Time-specific

Module 6: Flexibility Training

- What are the three syndromes associated with poor posture? What are their effects, and what kind of exercises can address them?
    - Upper crossed syndrome
        - Effects:
            - neck and shoulder pain.
            - Tight chest and upper neck muscles.
            - Muscles of mid-back and rotator cuff are weak.
        - Solutions:
            - Use floor and stability ball cobra to strengthen.
    - Lower crossed syndrome:
        - Effects:
            - arched low-back and compresses lower back discs.
            - Caused by tight hip flexors,
            - weak glutes and abdominals.
        - Solutions:
            - Stretch hip flexors
            - strengthen glutes and core to decrease stress.
            - Floor and lower ball bridge
    - Pronation distortion syndrome.
        - Effects:
            - Inactive adults.
            - Tight calves and inner thighs.
            - Weak ankle and foot stabilizers.
            - Causes feet to become flat and knees to migrate inward.
        - Solutions:
            - Strengthen the outer hip and foot and ankle stabilizers.
            - Exercises: Tube walking, single leg balance reach.
- 5 types of flexibility training? What are some benefits and precautions for each?
    - **Self myofascial release**- foam rollers
    - Static stretching-
        - Allows muscle to relax and elongate, increase joint flexibility, improve posture, can decrease injury
        - Has ability to tear muscle
    - Dynamic stretching
        - Increase heart rate, Delivers nutrients to muscles, Reduce muscle tightness
        - It is a progression of static stretching
    - Yoga
        - Reduces stress, hypertension, cholesterol
        - Can be dangerous for those with severe hypertension, diabetes, pregnancy, and acute back pain since they have odd positions
    - Pilates
        - Same as yoga
- What are some risks associated with poor flexibility?
    - Body imbalance
    - Bad posture
    - Decreased range of motion
- What can positively and negatively affect flexibility?
    - Age
    - Previous injury (scar tissue)

- Activity level

Module 7: Core and Balance Training

- What has research shown to be the usual causes of lower-back pain? How does core training help prevent and rehabilitate this condition?
  - Weaker core
  - Decreased activation of abs
  - Weak back extensor muscles
  - Sedentary and obese people
  - Core training restores size and endurance of local and global muscles
- What is the difference between core and balance training? What is the focus of each? Why is understanding this important?
  - Core training focuses on local and global muscles<-know these to strengthen them
    - Must start with local muscles then move to global muscles using drawing in method to strengthen obliques and transversus abdominis
  - Balance training focuses on joint stability and controlled instability to fill gap found in traditional exercise programs
  - More demand on nervous system
  - Difference is important because core training doesn't train balance and control for stability

Module 8: Cardiorespiratory Training

- What is the cardiorespiratory/cardiovascular system?
  - Provides tissues with oxygen, nutrients, and a means of removing waste products
- What is the cardiorespiratory/cardiovascular system comprised of?
  - Blood, heart, blood vessels, arteries, and capillaries
- Benefits of good cardiorespiratory fitness?
  - Efficient heart
  - Reduced risk of obesity, cancer, and heart disease
  - Reduction in premature death
  - Decreased anxiety, fatigue, and depression
- Results of poor cardiorespiratory fitness?
  - Increased blood pressure
  - Death
- Difference between aerobic and anaerobic training?
  - Aerobic requires oxygen to be delivered to body, converting carbs to energy
  - Anaerobic
    - Inadequate supply of oxygen to the tissues
    - Relying on carbs
    - Short bursts of intense activity
- What is the F.I.T.T.E. principle? Helps monitor exercise program.
  - Frequency
  - Intensity
  - Type
  - Time
  - Enjoyment
- How is cardio intensity measured? Why is this important to designing a cardio program?
  - On a scale from one to ten (Huh??? - that's how it's measured)
  - Whether a conversation can be held while doing the exercise
  - Helps you know when to intensify exercise or when the program is too difficult for you
- Be familiar with the work-out zones and stages of exercise.

    - Basic cardio program
    - Interval training
    - Circuit training

Module 9: Strength Training

- What are some health benefits of strength training for general fitness? For athletes and participants in sports?
    - Strength
    - Better posture
    - ease of carrying out daily activities
    - Enhances self-image
    - Increases muscular endurance
    - Heart rate and blood pressure decrease
    - Athletes
        - Less risk of injury
        - Increased power
        - Generate force faster
- What is strength, endurance, hypertrophy, etc?
    - Strength is the ability to lift heavy weight at low reps
    - Endurance is relatively low weight with high reps
    - Hypertrophy is moderate to heavy weight with moderate to low reps and high sets
- Correct progression for developing strength?
    - Continually changing routine
    - Start easy to build a foundation, doing easy and light movements to allow body to adapt to new forms of stress
    - Stability then strength then power
- Why is strength training important to functional movement?
    - Improves coordination
    - Improves posture
    - Improves endurance
- What are the 3 types of muscle contractions?
    - Concentric
        - Shortening of muscle
        - Exerting more force
    - Eccentric
        - Lengthening of muscle
        - Negative movement
        - Less force
    - Isometric
        - Force is equal to that placed on the muscle
            - No change in muscle length- stabilization
- What are the 5 checkpoints to ensure proper posture during exercise? Describe the correct position for each checkpoint.
    - Feet
        - Point forward
    - Knees
        - Align with feet
    - Back
        - Avoid arching
    - Shoulders

        - Keep shoulders back
    - Head
        - Don't jut forward

Know macronutrient percentages plus obesity rates which are?
Carbs (40-65% of daily calories)
Protein (10-35%)
Fats (20-35%)
Thank You^
What about the obesity rates?
36% total adult population, 17% children (ages 2-18), 33% adult population=overweight
Info about local/global muscles:
local muscles:

- **Posterior fibres of internal Oblique**
- **Pelvic Floor muscles**
- **Diaphragm**
- **Multifidus**
- **Transverse Abs**
- **Core Bracing, Pelvic Floor**

How much is the essay worth in points vs the multiple choice/true false???
The essay is 10 points; the mult choice & t/f is a 100. 110 total

Does anyone know if we leave knowing our grade? **My TA said we will know our multiple choice raw score, but not the essay question. SO we should at least have some sort of idea what we got.** **Thank u.** **You're welcome!**

How are y'all studying?
^ I'm just using my quizlet because it has the labs and the study guide and extra info - but if you're studying separately, i would skim through the modules, look at the study guide and make sure you know the answers to the questions, and know *PERCENTAGES FOR EVERYTHING*
^ *study guide says very few percentages? But everyone that's taken the test says they always get caught up on percentages and numbers*

NOTE: IF YOU JUST MEMORIZE THE STUDY GUIDE AND DO NOTHING ELSE, MY TA SAYS YOU'RE ALMOST GUARANTEED AN 80 ON THE EXAM - IF YOU WANT A HIGHER GRADE, YOU NEED TO WATCH THE MODULES AND KNOW EXTRA INFO -- Good enough for me

Does anyone who had the class mwf at 9:05 know where/when the exam is on wednesday? **Fetzer gym b**

Are the exams all the same? Or are there a ton of different versions?
^ different versions but I think they're similar. They all come from a test bank, the questions you get are apparently randomized. There are like 300 questions they can choose from and they randomly give you 35 of them

LFIT Final Exam Review PART DEUX- more info

Review from Modules:

Module 1: Current Health Status and Benefits of Healthy Living

Identify the top 3 causes of death in the USA. Why is the number of deaths rising due to these diseases? How does diet and lifestyle contribute to the growth of these diseases?

- Cardiovascular disease, cancer and chronic lower respiratory disease
    - *Cardiovascular disease: coronary heart disease – plaque build up inside coronary arteries (supply oxygen rich blood to heart); atherosclerosis (plaque buildup in arteries) is accelerated by a poor diet and a sedentary lifestyle
    - *Cancer: Risk factors include obesity, tobacco use, unsafe sex and excessive sun exposure; 1/3 of cancer related deaths are linked to poor diet, lack of physical activity and obesity
- The American lifestyle induces the 4 risk factors for these diseases: lack of physical activity, poor nutrition, tobacco use and excessive alcohol consumption. Technological advancements reduce the need for physical activity and processed food is everywhere.

How is obesity defined? What diseases are associated with being overweight and/or obese? What lifestyle changes contribute to weight gain and how can a person overcome obesity?

- Obesity = having too much body fat; BMI of 30 or greater or 30 lbs over recommended weight for height
- Linked to cardiovascular disease, cancer, type 2 diabetes, arthritis, pregnancy complications and shortened life expectancy
- Weight gain caused by lack of physical activity and poor dietary habits.
- The most effective way to lose weight would be to adopt a dietary and resistance training program – 97% of weight loss will originate from fat

What are some key goals of the Healthy People 2020 initiative and what are the rationales behind these goals? (potential essay?)

- Higher-quality, longer lives free of preventable disease, injury and premature death [Rationale: diet and exercise can be modified to prevent diseases like cardiovascular disease, cancer, obesity, arthritis, osteoporosis]
- Health equity, eliminate disparities and improve the health of all groups [Rationale: children, adolescents and adults suffer from obesity]
- Create social and physical environments that promote good health for all [Rationale: American lifestyle is sedentary. Grocery stores are filled with unhealthy processed foods and restaurants serve large portions]
- Promote quality of life, healthy development and healthy behaviors across all life stages [Rationale: Americans are consuming **240 more calories a day than they did 40 years ago.** <-lol is this a hint; do we need to know this? <-My roomie remembers this from her exam yesterday Only **20.6%** of adults meet the requirements for aerobic and strength activities; obesity and diabetes affects children and adults]

**2020 Initiative* *focuses on health services, physical activity, tobacco use, nutrition and weight status, mental health, injury and violence prevention, substance abuse, irresponsible sexual behavior, immunization and oral health*

Module 2: Health and Fitness Assessments

What is cardiovascular disease and who does it affect?

- Broad term used to describe a range of diseases that affect your heart and blood vessels
- *Cardiovascular disease: coronary heart disease – plaque build up inside coronary arteries (supply oxygen rich blood to heart); atherosclerosis (plaque buildup in arteries) is accelerated by a poor diet and a sedentary lifestyle
- 1 in every 4 adults die of cardiovascular disease (600,000 per year)

What is the "silent killer"?

- High blood pressure (aka hypertension)
- Can lead to stroke, heart attack, heart failure or kidney failure

Familiarize yourself with cholesterol (know normal values), blood pressure (know normal values), diabetes, and other common diseases in America.

- Healthy cholesterol: Below 200 mg/dl (borderline high is 200 – 239 and high risk is over 240)
    - HDL (good) = greater than 40 mg/dl
    - LDL (bad) = less than 130 mg/dl
- Blood pressure:
    - Systolic(contraction) (pressure produced by heart as it pumps blood to the body) = less than 120 mm Hg
    - Diastolic(expansion) (minimum pressure within the arteries through a full cardiac cycle) = less than 80 mm Hg
- Diabetes = blood sugar is unable to enter the cells because the pancreas is unable to produce insulin or the cells have become insulin resistant
    - Type 1 (juvenile) = pancreas doesn't produce insulin
    - Type 2 = cells are resistant and don't allow insulin to bring enough blood sugar into the cell; 85% of type 2 diabetics are overweight/obese
- Cancer
    - 2nd leading cause of death in US
    - Lung cancer accounts for majority of cancer related deaths
    - Risk factors include obesity, tobacco use, unsafe sex and excessive sun exposure
    - 1/3 of cancer related deaths are linked to poor diet, lack of physical activity and obesity
- Obesity
    - Having too much body fat
    - BMI of 30 or greater or 30 lbs over recommended weight for height
    - Desirable BMI: 18.5 – 24.9

- Arthritis
    - Osteoarthritis = degeneration of cartilage in joints, bone surface wears and pain and inflammation occur
    - Rheumatoid arthritis = body's immune system attacks its own +tissues, joints are inflamed and pain and stiffness ensues
        iii. Other types = lupus, gout, fibromyalgia, juvenile arthritis

What is the recommended amount of physical exercise?

- 2 ½ hours of moderate intensity aerobic activity every week *OR*
- 1 hour 15 minutes of vigorous intensity aerobic activity every week
- Muscle strengthening activities twice a week

Familiarize yourself with the different fitness assessments and what each one measures. What does a comprehensive fitness assessment involve and what is its role in health management?

- Comprehensive fitness assessment = series of measurements that help determine current health and fitness levels; ongoing gathering of info so you know where to start and how to modify an exercise program
- **Preparticipation screening:** includes a medical history questionnaire, a review of chronic disease risk factors, and presence of any signs/symptoms of diseases
    - Results help determine if an individual can start fitness training
- **PAR-Q: Physical Activity Readiness Questionnaire:** aimed at identifying people who need further medical evaluation before they are permitted to start fitness exercise

- **Biometric Screening:** physiological assessments that provide a wealth of information regarding your personal wellness and fitness
- **Resting Heart Rate:**
    - Desirable: 60 bpm- 100 bpm
    - Lower resting heart rate signifies a stronger heart
    - Taken on the radial pulse or carotid pulse
- **Blood Pressure:** Blood Pressure: measured using a sphygmomanometer and a stethoscope
    - Systolic/Diastolic
    - Normal: 120/80
    - Systolic: <120 mm of mercury
- **Body measurement assessments** (anthropometric assessments)
    - Help you determine if your fat and weight percentages are in healthy or unhealthy ranges
- **Body Mass Index (BMI)**
    - Simple and easy but fails to differentiate fat from muscle
- **Underwater weighing (hydrostatic weighing):** weight on land is compared to your weight in water to determine your fat percentage
    - Accurate but there are only a few of them
- **Skinfold assessments:** skinfold calipers measure subcutaneous fat (fat beneath the skin) by calculating the size of the skinfolds
- **Bioelectrical impedance:** sensors are applied to the skin, a weak electrical impulse is run through the body to estimate body fat and lean body mass
    - Can differentiate fat from muscle but How hydrated you are can significantly alter measurements
    - Used during labs 1 & 5

Body composition can be an indication of risk for certain diseases. How can body composition be used as part of a fitness program?

- As body fat-to-lean ratio increases, so do health risks; unhealthy body composition can lead to obesity and other complications
- can be used to determine baseline fitness so you know where to start and how to modify an exercise program

What is BMI?

- Weight in kilograms divided by height in meters squared
- Used to determine overweight and obesity levels

What is the difference between overweight and obese?

- Overweight = BMI of 25 – 29.9 *or* 25 – 30 pounds over recommended weight for height
- Obese = BMI of 30 or greater *or* 30 pounds over recommended weight for height (morbidly: over 40)

What kind of information is gained from a postural assessment?

- Any gross deviations in overall posture
- Muscle imbalances and muscle tightness

Module 3: Nutrition and Supplementation

What are the 3 macronutrients? What are the recommended intake ranges for each?

- Carbohydrates
    - energy for basic metabolic function, fuel for vigorous exercise
    - minimum of 130 grams per day (45-65% of daily calories)
- Proteins
    - growth/repair of tissue, immune system support, synthesize hormones and enzymes
    - 0.4 grams (.8 grams per athlete) per pound of body weight (10 – 35% of daily calories)

- Fats (energy source) – 20 – 35% of daily calories; saturated fat intake - less than 10% of daily calories

^ THIS SEEMS TO BE THE MOST COMMON ESSAY.

What are micronutrients?

- Only necessary in small amount
  - Vitamins - growth, development, reproduction, regulation of body processes, needed to extract energy from food
  - Minerals - body structure and regulation; examples: calcium, phosphorous, sodium, potassium, iron, sodium chloride
  - Water - most essential nutrient
    - Men need about 3 liters (13 cups) of water each day. Women need about 2.2 liters(9 cups) of water each day.

What are some risks associated with high sugar intake? Risks from high saturated and trans fat intake? What kinds of foods are likely to cause these?

- High Sugar Intake – diabetes, obesity, liver disease (soda, candy, cookies)
- Saturated Fat – increases bad cholesterol levels, risk of heart disease (animal products)
- Trans Fat – increase bad cholesterol and decrease good cholesterol, risk of heart disease (stick margarine, baked goods, snack foods, fast foods)

What are potential benefits AND risks associated with dietary supplements?

- Help people meet nutrient deficiencies caused by poor diet
- Some may impose significant risks with minimal benefits

Module 4: Weight Control

A common misconception is that eating fat causes weight gain. What causes weight gain?

- Weight gain is caused by consuming more calories than you burn. In scientific terms, having more energy in than energy out.
- mindless eating
- eating large portions
- lack of physical activity

How does energy balance relate to weight loss?

- 3 types of daily energy:
- resting metabolic rate (sitting, walking, typing, sleeping)
- thermic effect of food (energy received from food)
- physical activity
- Weight loss happens when more calories are expended than consumed! Therefore in order to effectively lose weight, one must increase the percentage of physical activity (and/or decrease consumption) within their day.

What does the evidence show regarding high protein/low carbohydrate diets?

- Evidence shows that the idea that " a high protein, low carb diet" is the most effective way to lose weight is a MYTH. Although this is a way to lose weight, it makes weight loss accelerate and this often leads to short term results. This type of weight loss is hard to adhere to which can lead to binge eating. The most effective weight loss diet is to reduce caloric intake by cutting back portions.

Module 5: Behavior Modification

What are 5 barriers preventing people from beginning an exercise program or engaging in daily physical activity? What is the most cited barrier?

- Lack of time (most cited barrier)

- unrealistic goals and expectation
- poor social support network
- anxiety
- lack of convenience
- **Stress:**
    - stress is mental or emotional strain resulting from adverse or very demanding circumstances

What are some reasons many people have trouble changing unhealthy lifestyle habits?

- problems with competence (lacking the skills for a given task)
- problems with confidence
- lack of motivation

Mind- to- muscle stress coping techniques

- Yoga
    - Alleviates stress, lowers blood pressure
- Meditation
    - Mind focusing exercise to control one's attention.
- Visual imagery
    - Creating relaxing visual images
    - Should be performed in comfortable environment
- Autogenic inhibition
    - Autohypnotic state, deep mental and physical relaxation
- Exercise
- psychological benefits
    - positive mood
    - better sleep
    - happiness
    - energized
    - Control stress
    - less angry and irritable
    - anger is associated with hypertension and heart disease

What are SMART goals?

- S=specific
- M=measurable
- A= attainable
- R=realistic
- T=time-specific

Module 6: Flexibility Training

- 3 myths with flexibility
    - No such thing as too much flexibility
    - Necessary to increase tissue temperature prior to static stretching
    - Static stretching should always be avoided prior to athletic performance
- Flexibility - ability to move a joint through its complete range of motion (joint mobility)
- Poor flexibility decreases proper posture and movement patterns
- Benefits of flexibility
    - Inc joint range of motion
    - Relieving joint stress

What are the three syndromes associated with poor posture? What are their effects, and what kind of exercises can address them?

- Upper Crossed Syndrome: tight chest and upper neck muscles, weak mid-back and rotator cuff. The floor and stability ball cobra help strengthen muscles of mid-back.
- Lower Crossed Syndrome/ Arched Lower Back: Tilts the pelvis forward, resulting in compression of the vertebral discs of the low-back and lengthens the muscle fibers of the hamstring often resulting in low-back and hamstring strains. Stretching hip flexors with self-myofascial release and static stretching to help restore proper extensibility and range of motion. Also, strengthen glutes and abs. Stronger core will help restore proper positioning of pelvis and lumbar spine – exercises: floor and ball bridge.
- Pronation Distortion Syndrome: Flat feet and knees turned inward. Found in inactive adults, caused by excessive tightness of the calves and inner thighs, as well as weakness of the foot and ankle stabilizers and outer hips. Stretch calves and inner thighs using self-myofascial release and static stretching. Strengthen outer hip, foot, and ankle stabilizers. Tube walking to strengthen outer hip and single balance reach to strengthen muscles that stabilize foot and ankle.

What can positively and negatively affect flexibility?

- Negatively affect: age, previous injuries, activity level

Definition of flexibility

- ability to move a joint through its complete range of motion, also known as joint mobility

5 types of flexibility training? What are some benefits and precautions for each?

- Self-myofascial release (foam rolling):
  - *Benefits:* form of self-massage by aligning straighter fibers and the muscle. Can reduce pain and tension. Suggested to use before static stretching to alleviate tension.
  - *Precautions:* Should be approached with caution and avoided by people with congestive heart failure, kidney failure, bleeding disorders and contagious skin conditions.
- Static Stretching: Passively taking a muscle to point of tension and holding for 30 seconds.
  - *Benefits:* Allows muscle to relax and elongate. Improves joint range of motion, overall posture and function, prior to activity. Decreases chances of injury and may improve ability to move biomechanically correct.
  - *Precautions:* Should not be performed with muscle recently experiencing injury like a strain or tear. Individuals who are obese, pregnant, or hypertensive should do stretches standing and sitting rather than on their stomach or back
- Dynamic Stretching: Low intensity exercises that mimic high intensity activities to follow. Take joint through full available range of motion.
  - *Benefits:* Helps increase heart and respiration rates which help deliver oxygen and nutrients to working muscles. Useful before sports to reduce muscle tightness and improve overall performance by enhancing the nervous system's ability to contract muscles forcefully.
  - *Precautions:* Individuals should have relatively good levels of tissue extensibility, core strength and balance before jumping, bounding and single leg balance activities. People with chronic disease or acute injuries like strain or sprain should consult doctor before.
- Yoga:
  - *Benefits:* Can positively affect physiological and emotional wellness. Reduction in stress, blood pressure, hypertension and cholesterol
  - *Precautions:* Exercises such as lying on back not good for those who are pregnant, have hypertension or advanced diabetes. Positions may cause increased joint pain if not performed correctly.
- Pilates. Emphasizes posture, flexibility, deep breathing and ab strength.
  - *Benefits:* low-back pain, improvements in posture, flexibility, muscular endurance, and balance.

    - *Precautions:* Exercises such as lying on back not good for those who are pregnant, have hypertension or advanced diabetes. Positions may cause increased joint pain if not performed correctly.

What are some risks associated with poor flexibility?

- decreases the body's ability to maintain proper posture and perform ideal movement patterns which may ultimately lead to injury during everyday activities and sporting activities

Module 7: Core and Balance Training

What has research shown to be the usual causes of lower-back pain? How does core training help prevent and rehabilitate this condition?

- Usual causes of lower-back pain: decreased activation of certain muscles or muscle groups, including transverse abs, multifidus and internal obliques. Have weaker superficial back extensor muscles and decreased muscular endurance. Sedentary and obese people have increased risk. Core exercises can restore the size, activation, and endurance of the local and global core muscles. With core training, people have decreased chance of injury, and improved performance measures.

What is the difference between core and balance training? What is the focus of each? Why is understanding this important?

- Core training: Improving your core is vital for improving overall function, and avoiding injury and chronic pain. Aid stability to your spine and pelvis. Must be systematic and progressive: first, stabilize the spine, then to improve strength and power. = balanced muscular functioning of entire body, aids in injury prevention and maximizes performance.
- Balance training: We use balance to control our center of gravity. Poor balance associated with injury risk—helps enhance stability and coordination to prevent non contact injuries. Developing joint stability during dynamic activities—makes your body move in biomechanically correct manner.
    - Main goal: continually increase awareness of your limit of stability by creating controlled instability. Must be systematic and progressive as well
- Balance training fills the gap left behind by regular exercise, core training part of workout routine. Balance works on balance in all aspects of body, esp. lower extremities and core focuses on inside and outside abs. Must know because: not the same thing, both are important to do.

Module 8: Cardiorespiratory Training

What is the cardiorespiratory/cardiovascular system?
What is the cardiorespiratory/cardiovascular system comprised of?
Benefits of good cardiorespiratory fitness? Results of poor cardiorespiratory fitness?
Difference between aerobic and anaerobic training?
What is the F.I.T.T.E. principle?

- Frequency
- Intensity
- Type
- Time Specific
- Enjoyment

How is cardio intensity measured? Why is this important to designing a cardio program?
Be familiar with the work-out zones and stages of exercise.
LFIT chap 8

- Cardio respiratory training
- Health-related physical fitness

- Cardiorespiratory fitness
- Muscular strength
- Muscular endurance
- Flexibility
- Body composition

One of the most common errors made by individuals when beginning a cardiorespiratory training program is the failure to consider rate of progression. Rate of progression is critical to helping you achieve your personal health and fitness goals in the most efficient and effective manner possible. In addition, failure to carefully consider and monitor rate of progression can also result in injury. Program should be **systematic** and **progressive**.

Poor cardiorespiratory fitness increases the risk of premature death from all causes, but particularly from cardiovascular disease. Conversely, an improvement in cardiorespiratory fitness is related to a reduction in premature death, reduced risk of obesity, diabetes, heart disease, and cancer and decreased cholesterol levels and blood pressure. Benefits of cardiorespiratory activity include increasing **athletic performance, sense of wellbeing, and immunity while decreasing daily fatigue, anxiety, and depression.**

Cardiorespiratory exercise is traditionally defined as any activity that raises heart and respiration rates involving large muscle groups in a repetitive and rhythmic nature.

Exs: jogging, cycling and swimming, weight training, calisthenics and participating in sporting activities.

The cardiorespiratory system is made up of the cardiovascular and respiratory system.

- The function of the cardiorespiratory system is to provide the tissues of the body with oxygen, nutrients, protective agents and a means to remove waste products.
- The more physically fit you are, the more efficiently your cardiorespiratory system works.
- The cardiovascular system transports blood throughout the body and is comprised of the heart, blood and blood vessels.
- basic measurements of the heart include stroke volume, heart rate and cardiac output.
    - cardiac output: is the product of stroke volume and heart rate
    - stroke volume: the amount of blood that is pumped per contraction of the heart

Blood

- functions include transportation, regulation and protection.
- transports oxygen, nutrients and hormones to organs and tissues, carries heat throughout body, and transports waste products away from tissues.
- Regulates body temperature and pH balance in the body.
- blood protects the body by containing immune cells to help fight disease and sickness.
- Blood vessels transport blood through a network of arteries and veins. **Arteries carry blood away** from the heart, while **veins carry blood back toward** the heart. Atherosclerosis is the process in which deposits of fatty substances, such as cholesterol, build up in the inner lining of an artery significantly reducing blood flow, which can potentially lead to a heart attack or stroke.

The respiratory (or pulmonary) system

- collects oxygen from the external environment and transports it to the bloodstream and is made up of the respiratory pump and respiratory passageways. The respiratory pump is made up of the lungs which work in concert with bones such as the sternum, ribs and vertebrae and muscles like the diaphragm and abdominals to allow for proper breathing.
- Breathing is the process of moving air in and out of the body through inspiration and expiration.
- Respiratory airways purify, humidify, warm or cool air, and allow gases to be transported in and out of the bloodstream.

Cardiorespiratory exercise

Aerobic

- prolonged low-intensity exercise.
- exercise tissues rely on oxygen to convert carbohydrates and fats to produce large amounts of energy.
- If oxygen can be supplied to the point where it meets the demands of working tissue the activity is aerobic.
- -Ex: walking, bicycle riding, and cross-country skiing

Anaerobic

- short bursts of high intensity activity.
- If the oxygen supply is not adequate for working tissues to produce energy the activity is considered anaerobic.
- This energy pathway relies almost exclusively on carbohydrates as a fuel source but the amount of energy produced is very limited.
- -Exs: 100 meter sprint, shot put and high intensity weight training.

*physiological and perceptual responses to exercise are highly variable

Module 9: Strength Training

What are some health benefits of strength training for general fitness? For athletes and participants in sports?

- improves bone density
- decreases osteoporosis, controls blood sugar
- prevents diabetes, decreases heart rate and blood pressure, increases strength and muscular endurance, increases lean body mass and improves body composition, prevents injury, improves joint integrity, strengthens connective tissue, improves coordination, performance enhancement and improvement of force production for athletes

What is strength, endurance, hypertrophy, etc?

- -Strength: ability of the neuromuscular system to exert force against external resistance
- -Endurance: Ability to exert oneself for a long period of time
- -Hypertrophy: Increased muscle mass, the enlargement of an organ or tissue from the increase in size of its cells.

Correct progression for developing strength?

- stability
- strength
- power. slowly add more volume, heavier weights, greater velocity and shorter resting period

Why is strength training important to functional movement?

- improves strength and muscular endurance and improves joint integrity,which decreases stress to soft tissues.

What are the 3 types of muscle contractions?

- concentric-- more force being exerted, muscle shortens
- isometric-- equal force. no change
- eccentric-- less force being exerted, muscle lengthens **correct position for each checkpoint.**
- Feet-- point straight ahead
- Knees-- point straight ahead and keep inline with toes
- Low back- neutral position
- Shoulders- keep shoulders back
- Head-- neutral position

Strength training

- Strength is defined as the ability of the neuromuscular system to exert force against external resistance.
- The two primary systems involved to improve muscular strength are the **muscular and nervous systems,** which together comprise the neuromuscular system. Nerves connect with muscles and, depending on the stimulus, send signals to muscles to contract.
- The higher the stimulus, the more muscle fibers are told to contract. The more fibers that contract, the more resistance we can overcome, which is commonly referred to as strength.
- Improvements in strength are typically due to improvements in both the nervous or muscular systems.
- There are three types of muscular contractions
- Concentric
- Isometric
- Eccentric

When a muscle contracts **concentrically** it is exerting MORE force than is being placed on it. This results in a shortening of the muscle. A prime example is a tubing biceps curl. During elbow flexion, or curling the handles upward, the elbow flexors primarily the biceps brachia overcomes the resistance of the tubing and the muscle fibers shorten.

When a muscle contracts **isometrically**, it is exerting force EQUAL to that placed on it. This results in no appreciable change in the muscle length. Still using the biceps curl as an example, an isometric contraction can be observed as the exerciser pauses at the top of the exercise.

During an **eccentric** muscle action, the muscle is exerting LESS force than is being placed on it. This results in lengthening of a muscle. An eccentric muscle action is also known as the "negative" in the fitness industry. For example, during the downward phase of a biceps curl, the elbow flexors exert enough force to slow the descent of the tubing but not enough to stop the descent.

Because all muscle actions carry over to everyday life and sport, you must train all aspects of the spectrum to enhance overall strength. In movement, most injuries occur during the **eccentric** phase of movement, such as landing from a jump or trying to decelerate and change directions. Consequently, eccentric muscle actions should be emphasized. In other words, you should use a slow and controlled tempo with all resistance training exercises emphasizing proper posture and control and never drop the weights back to the starting position.

- The skeletal system also plays a vital role in strength. The musculoskeletal system is comprised of bones, muscles, ligaments, tendons, cartilage and joints.
    - It provides form, support, stability, and a series of levers and pulleys that generate force against external objects. Skeletal muscles are attached to bone by tendons, and produce movement by bending the skeleton at movable joints.
- Muscles pulling on bones cause joint movement.
    - When one group of muscles contracts initiating joint motion, the opposite group of muscles stretches.
    - The size and shape of muscles and attachment sites to bones will determine how much force the muscle is capable of generating.
- Benefits of Strength training
- -It improves bone density decreasing the risk for osteoporosis
- -It helps control blood sugar, which decreases risk for diabetes
- -Heart rate and blood pressure may decrease
- -It increases strength and muscular endurance allowing you to perform everyday activities more efficiently
- -It is important for maintaining lean body mass and improving body composition, which may help enhance self-image.
- -Improves joint integrity which decreases stress to soft tissues

- - It strengthens connective tissue such as tendons and ligaments decreasing the risk of overuse injuries such as runner's knee.
- -Improves coordination, which can potentially decrease the risk of falls or other performance-related injuries due to better body control.
- -Shown to decrease the risk of injury,
- -Improves force production.

(Increased strength and power, or the ability to generate force quickly, leads to improvements in athletic performance such as the ability to run faster, jump higher or throw farther.)

Principles of specificity

- The body will adapt to the specific demands that are placed on it.
- Can design specific programs.
- Stability and muscular endurance or the ability for muscles to work for extended periods of time requires lifting relatively light weight coupled with high repetitions. 12-20 reps & 1-3 sets
- Increases in muscle size, important for bodybuilders, and fitness models, moderate to heavy weight with moderate to low repetitions and a high volume of sets should be used. 6-12 reps & 3-5 sets
- Maximal strength or the ability to lift heavy loads requires lifting heavy weight for only a few repetitions and a high volume of sets. Ex: football linemen. 1-5 reps & 4-6 sets
- Power, or the ability to generate force quickly requires low to moderate weight and repetitions but at high velocities and a high volume of sets. Athletes requiring high levels of explosiveness benefit from power training.

-Keep varying your strength training routine to see continued change.

-Ways to progress your strength training routine: changing the exercises, amount of weight used, number of sets, number of repetitions, and length of rest periods between exercises.

-Start slow allow your body to adapt before progressing

Resistance stabilization

- -Needs to be stable in order to be strong.
- As such, most people should begin with resistance-stabilization exercises. These exercises focus on your stabilization muscles (or the muscles that help support your joints and spine) in addition to helping improve your posture and coordination.
- -Use stability balls or perform an exercise from a standing or even a single-leg stance
- Exs: of resistance stabilization exercises
    - -Ball cobra
    - -Single leg squat
    - -Single leg scaption

Resistance Strength

- Help build muscle size and maximal strength. Because heavier loads are required for this type of training, stable environments such as benches and machines are recommended.
- Exs: of resistance strength exercises
    - -Deadlift
    - -Lat pull-down
    - -Shoulder press machine
    - -Bench-press

Resistance power

- Individuals may not train this way frequently, but it is a good way to create overload and continual adaptation once stability and strength have been developed. Power exercises can be performed by throwing medicine balls, explosive movements with tubing or even jumping exercises known as plyometric.
- Exs: of resistance power

    - Plyometric pushup
    - Woodchop throw
    - Squat jump

Safety

1. Feet. Keep your feet pointing straight forward this will take excessive stress off of your ankle, knee and hip joints.
2. Knees. Keep your knees pointing straight ahead in line with your toes. A common compensation is allowing the knees to migrate inward. This can place abnormal stress to the knee joint and is a common movement dysfunction with athletes who experience ACL injuries.
3. Lower back. The lower back should remain in a neutral position. Avoid excessive arching or rounding of the low back to prevent compression on the vertebral discs.
4. Shoulders. Keep your shoulders back during most movements. The shoulder joint is less stable when it is rounded forward.
5. The head. Your head should remain in a neutral position. Jutting the head forward can cause neck pain.

Resistance training Equipment

- Benefits: Easy for beginners, popular, safer than free weights, limits excessive range of motion, less intimidating, can easily change load
- Disadvantages: inferior to free weights for improving core stability and coordination because they offer artificial support versus one's core musculature providing the stability. Fail to accommodate multi-joint movements that can incorporate the use of both the upper and lower extremities simultaneously. Not designed to fit all body types and thus can limit the effectiveness of the exercise and possibly create more stress to joints. They work in one plane of motion and can limit your ability to develop strength in all planes of motion.
- Cable machines
    - -They allow similar freedom of movement as free weights, yet most exercises do not require a spotter.
    - -Cable machines are also an excellent option to challenge the core while having individuals perform exercises in a standing position versus seated as seen in many machine exercises.
    - -Important to align the line of pull of the cable with the line of pull of the muscle being worked.
- Elastic resistance
    - Exs: bands and tubing
    - -Inexpensive alternative compared to free weights or machines.
    - -Not ideal for improving maximal strength, but beneficial in helping to improve muscular endurance for fitness and rehabilitative purposes.
    - -Allows individuals to move in multiple planes of motion and perform resisted exercises that mimic sport-specific movements such as golf swing or tennis forehand.
    - -Bands vary in size and shape and are generally color-coded
- Medicine balls
    - -Weighted balls that come in an assortment of weights and sizes, made with a variety of materials,
    - -Popular because they can be thrown, caught, and used to provide resistance for a variety of movements, in a variety of planes of motion, and at a variety of velocities.
    - -The ability to develop explosive power is one of the unique benefits of training with medicine balls. The medicine ball is a very useful tool because it allows movements to occur as explosively as possible without the need for eccentric deceleration. (Ex: chest pass)

- Kettlebells
  - -A kettlebell is a flat-bottomed cast iron ball with a handle, and comes in a wide range of sizes and weight.
  - -The center of mass is away from the handle, which may require more strength and coordination during particular movements.
  - -Utilizes swing type movements
  - Benefits:
    - -Enhanced athleticism
    - -Coordination and balance
    - -Increased total body conditioning as opposed to isolation training
    - -Increased core stability and muscular endurance
    - -Increased strength and power• Improved grip strength
    - -Increased metabolic demands and caloric expenditure
- Bodyweight training
  - -Do not require additional load such as dumbbells, barbells, or machines.
  - -An individual's own body weight along with gravity provides the resistance for the movement.
  - Exs: push-ups, pull-ups, and body weight squats.
  - -Learn how to train in all planes of motion and may acquire greater kinesthetic awareness.
  - - Body-weight training exercises are closed-chain exercises. Closed-chain exercises may result in greater muscle recruitment and coordination when compared with open-chain exercises.
- Suspension bodyweight trainers
  - -Uses a system of ropes and webbing that allows the user to work against their own bodyweight while performing various exercises.
  - - A single anchor point supports either the user's hands or feet while the opposite end of the body is in contact with the ground, enabling the loading and unloading of movements to meet individual needs and goals.
  - -Allow individuals to manipulate body position to provide multi-planar, multi-joint exercises in an unstable yet controllable environment.
  - Benefits:
  - -Increased muscle activation
  - - Low compressive loads to the spine
  - -Increased performance
  - -Potential increase in caloric expenditure
  - -Improvements in cardiovascular fitness
- Stability balls
  - -Improve posture and rehab purposes-
  - -The spherical shape of the ball creates an unstable base of support, forcing users to constantly adjust their body position
  - -The most popular use of stability balls involves using it in place of traditional benches to reinforcing postural awareness.
  - - Best used for individuals who demonstrate a need for increased overload of stability.
  - - If you can hold a plank on a stable surface such as the floor or bench, a stability ball can increase the intensity and difficulty of the exercise
  - -Performing a ball wall squat can help individuals gain the necessary stability and strength required for squatting motions.
  - -Good alt. if one has limitations for example lower back pain
- Free weights

    - -Free weights examples include dumbbells and barbells
    - Benefits:
    - - Perform exercises in all planes of motion with ranges of motion consistent with those experienced in daily life and sport. Combining all of these motions will enhance motor learning and improve coordination and performance.
    - -Free-weight exercises incorporate the entire body.
    - -Performing complex exercises requires more energy, enabling individuals to expend more calories in a shorter period.
    - -Best for fat loss.
    - Disadvantages:
    - -Many free-weight exercises, especially overhead lifts, often require a spotter to ensure proper exercise technique and safety.
    - -If too difficult, regress to a strength training machine
- Hormonal differences between men and women do not allow women to achieve the same level of muscle mass following a strength training protocol. Even though women do not generally gain the same amount of muscle mass as men, strength training is a proven method for improving body composition when used in conjunction with a proper diet and cardiorespiratory training.
- Research clearly demonstrates that strength training is both safe and effective for children and adolescents and will not stunt a child's growth. It does however improve motor skills such as sprinting and jumping, body composition, and bone mineral density. The most common injuries associated with resistance training in youth are sprains and strains, which are usually attributable to a lack of qualified supervision.

Review from Lab Manual:

Lab 1 and 5: Fitness Assessments

Preliminary health screening. What is it and why did you have to do it?

- Medical history questionnaire, review of chronic disease risk factors, presence of any signs or symptoms of disease
- Used to determine if fitness testing and exercise is appropriate or if a medical evaluation is warranted

Resting Heart Rate. What is it and why were you asked to do it?

- RHR = number of contractions of the heart that occur in a single minute while the body is at complete rest
- Indicator of the strength and efficiency of a heart.
    - Normal RHR is 60 – 100 beats per minute.
    - Over 100 bpm = tachycardia (risk of stroke and cardiac arrest)
    - Lower RHR = strong and efficient heart (heart has grown and size of chambers have increased so it pumps more blood, athletes have RHR in 40's)

Body Composition. What is it and why were you asked to do it? Which type is more accurate? Pros and Cons on BMI & BIA?

- Body Composition: % of fat, bone, water and muscle in human bodies
- Importance: as body fat-to-lean ratio increases, so do health risks; unhealthy body composition can lead to obesity and other complications; need to know if individual's weight and fat percentages are in healthy ranges
- BMI (Body Mass Index)
    - Pros: Simple and consistent

    - Cons: Fails to differentiate fat mass from fat free mass
- BIA (Bioelectrical Impedance Analysis) – MORE ACCURATE
    - Weak electrical current is run through body to estimate body fat and lean body mass (fat is less efficient as a conductor than lean tissue)
    - Pros: easy to administer, differentiates fat mass from fat free mass
    - Cons: quality of equipment affects accuracy, % of body fat may be off by as much as 10%

Cardiorespiratory assessment. What is it and why were you asked to do it?
- YMCA 3 Minute Step Test - estimate aerobic fitness level
- 96 steps per minute for 3 minutes, measure and record heart rate right after completing exercise

Muscular Endurance assessment. What is it and why were you asked to do it?
- Muscle's ability to exert sub-maximal force repeatedly over times, repetitions of same exercise until exhaustion
- High muscular fitness is correlated with higher qualities of life
    - Push Up Test - arms, shoulder, spinal stabilizers, chest, triceps and deltoids; performed as many push ups as possible within 60 seconds
    - Sit Up Test – abdominals and hip flexor muscles; performed as many sit ups as possible within 60 seconds

Flexibility Assessment. What is it and why were you asked to do it?
- Poor flexibility leads to poor posture, low back pain, joint pain and injury
    - Sit and Reach Test – measures flexibility of hamstrings and lower back; place both feet against box, extend legs and reach forward then record score to nearest inch

Lab 2: Dietary Analysis

Review nutrition basics (macro and micro nutrients)
- What are the 3 macronutrients? What are the recommended intake ranges for each?
    - Carbohydrates – minimum of 130 grams per day (45-65% of daily calories)
    - Proteins – 0.4 grams per pound of body weight (10 – 35% of daily calories)
    - Fats – 20 – 35% of daily calories; saturated fat intake - less than 10% of daily calories
- What are micronutrients?
    - Only necessary in small amount
    - Vitamins - growth, development, reproduction, regulation of body processes, needed to extract energy from food
    - Minerals -growth, development, reproduction, regulation of body processes, needed to extract energy from food
    - Water - most essential nutrient

Review your week long tracking, and reflect on any changes that you have made since.
- try and pick up a healthy meal for lunch on the days where I have a busy schedule, rather than just bringing various snacks in my book bag and eating them sporadically throughout the day
- prioritize eating more fruits and vegetables at meals

Lab 3: Core and Balance Training

What was the goal of this lab?
- Practice core and balance exercise techniques

Why were you asked to do it?

- Decreased levels of spinal stabilization and static and dynamic balance have been associated with increased incidence of low back pain

Which muscle groups are important for daily stabilization?

- Four muscles groups that are especially important to train:
  - Rectus abdominis = bends spine forward
  - Back extensor = pulls spine backward, create tension with rectus abdominis to keep spine locked in one position
  - Obliques = bend spine from side to side, twist spine, keep spine in place
  - Transversus abdominis = keeps spine aligned and helps control body in dynamic movement

Lab 4: Self-Myofascial Release & Resistance Training

What was the goal of this lab?

- Increase flexibility, loosen tight muscles, increase muscle strength

Why were you asked to do it?

- Flexibility is important for increasing joint range of motion, relieving joint stress, elasticity of muscles and connective tissue, improving coordinated movement (neuromuscular efficiency)
- Resistance training is important because muscular strength improves athletic performance, fat

OK Y'ALL THAT'S ENOUGH. 27 FUCKING PAGES IS ENOUGH OF INFORMATION THANK YOU :)

GOOD LUCK FAM

2018 Update

LFIT Module 1: Establishing A Healthy Concept of Self

- *Provide a clear, working definition of wellness, and explain how the definition of wellness has evolved over time*
    - Wellness → a state of being that maximizes your quality of life and contributes as much as possible to the well-being of the community around you.
        - Well-being is internal harmony, optimal energy, and aliveness
    - Old fitness and wellness paradigms focused on the abilities of physical body
        - Chronic diseases are leading cause of death today, vs infectious diseases
        - Active aging → including being physically active and capable of working, but also the capacity to be involved in social, economic, cultural, spiritual, and civic affairs
- *List the dimensions of well-being and explain the importance of balancing the dimensions of you for greater well-being*
    - Spiritual, environmental, intellectual, physical, financial, emotional, social, occupational
        - Wheel with you in center
    - The dimensions don't function individually. They blend together
        - Ex: healthy exercise not only strengthens your body but also strengthens minds and slows aging.
    - Well-being is dependent on your choices and attitudes
- *Identify and explain the determining factors that affect your well-being*
    - Not using tobacco
    - No excessive alcohol consumption
    - Avoidance of overweight
    - High educational level
    - Having stable relationships
- *Understand how your lifestyle choices impact your well-being*
    - Wellness doesn't just happen. You have to choose to develop it and make an effort. Everyone has choices.
    - One of the keys to wellness is to enjoy life your own way
- *Define "holism and healing" and explain why it's an effective way to improve your health and well-being*
    - Holism → "I am my body and I am my mind"
    - Conducive to wellness because it acknowledges the reality of the mind and the body. It sees the mind and the body as compatible because of their likeness and also that they are comparable in importance
    - TCM is a systems approach focusing on bodily functions.
    - Yin & Yang = balance
- *Identify the four key goals of the Healthy People 2020 initiative and describe the rationales behind these goals*
    1. Eliminate preventable disease, disability, injury, and premature death
        a. Rationale: diet and exercise can be modified to prevent diseases like cardiovascular, cancer, obesity, arthritis, and osteoporosis
    2. Achieve health equity, eliminate disparities, and improve the health of all groups
        a. Rationale: children, adolescents, and adults suffer from obesity
    3. Create social and physical environments that promote good health for all people
        a. Rationale: American lifestyle is sedentary. Grocery stores are filled with unhealthy, processed foods and restaurants serve increasingly larger portions
    4. Promote healthy development and healthy behaviors

    a. Americans are consuming 240 more calories a day than they did 40 years ago. Only 20.6% of adults meet the requirements for aerobic and strength activities. Obesity, diabetes affect children and adults.
- *Describe the concepts of immaterialism, materialism, and holism; explain how self-perception affects your wellness*
    - Immaterialism
        - "I am only my mind"
        - Body is casing for true self. Plato
        - Could be construed as physical health doesn't matter
    - Materialism
        - "I am only my body"
        - Body is who person is. Nietzsche
        - Could be construed as mental health doesn't matter/overdependence on physical health
    - Holism
        - "I am my body and I am my mind"
        - Body and mind work together
        - Make effort towards both physical and mental health → they are intertwined

LFIT Module 2: Motivation for Making Healthy Change/Behavior Change and Goal Setting

- *Identify and define the different dimensions of wellness. Be able to identify the area of wellness as it relates to real-life scenarios*
    - Physical, emotional, mental, social, occupational, environmental, spiritual, financial
    - Behavioral changes make a difference. Any kind of change is more manageable if you have a plan
- *Understand the Self-Determination Theory of Change and the 3 psychological needs of people across cultures*
    - Self-Determination Theory (SDT)
        - Theory of motivation based on the belief that humans have natural, intrinsic tendencies to make healthy and effective choices
    - 3 psychological needs of people across cultures
        - Autonomy
        - Competence
        - Relatedness
- *Know examples to barriers to behavioral change*
    - Emotional → I don't feel worthy
    - Physical → I'm out of shape
    - Economic → I can't afford to exercise (pay gym dues, take time off, etc.)
    - Logistical → I can't fit exercise into my schedule
    - Determinism
        - Outlook that says people and life are the way they are and there's no freedom to choose to be another way
- *Understand what the acronym SMART means*
    - **S**mart
    - **M**easurable
    - **A**ttainable
    - **R**ealistic
    - **T**ime-Specific
- *Describe 4 types of barriers to behavioral change and identify strategies for overcoming them*
    - Emotional, physical, economic, logistical
    - Create a plan

1. Self-asses
2. SMART goals
3. Create a strategy, make the commitment
4. Track progress, make adjustments

- *Distinguish the difference between self-acceptance self-esteem and achievement self-esteem*
  - Self-Acceptance Self-Esteem
    - A good feeling about yourself that comes as you accept your intrinsic value
  - Achievement Self-Esteem
    - A good feeling about yourself that comes as a result of approval from others, money, appearance, or some other contingency
- *Understand how mindset supports your desire to change*
  - Fixed Mindset
    - Abilities cannot be improved upon, so rather than working to change, we end up defending ourselves or trying to prove that we are capable
    - Path to Stagnation
  - Growth Mindset
    - Believe that with new learning, abilities, intelligence, and talents can change. We make effort to develop ourselves
    - Path to Opportunity and Success
  - Change requires you to switch from a fixed mindset to a growth mindset
    - Strategies
      - Work with people you trust and know believe in the ability to change mindsets.
      - Find people with growth mindset and learn from them
- *Identify the elements of the Transtheoretical Model of Behavior Change and each of the stages*
  - 5 core constructs
    1. Stages of Change (See Mnemonic above if you need extra help with this)
       a. Precontemplation
          i. Not planning to make change within next 6 mo
       b. Contemplation
          i. Intend to make change within the next 6 mo. Believe change is necessary but don't value it enough to make the commitment to make the change
       c. Preparation
          i. Intend to make the change within a month.
       d. Action
          i. Made changes over the past 6 mo. Observable changes. Good substitute behaviors replacing harmful ones
       e. Maintenance
          i. Continued behavior changes for another 6 mo. Continuation of action stage with intent for it to last a lifetime
       f. Termination
          i. Behavior has been fully adopted
    2. Processes of change
    3. Decisional balance
    4. Self-efficacy
    5. Temptation
- *Know the difference between intrinsic and extrinsic motivation*
  - Intrinsic Motivation
    - Behavior that is motivated by self-interest, internally interesting or satisfying
  - Extrinsic Motivation
    - Behavior is controlled or motivated by others or by some external reward

LFIT Module 3: Cardiorespiratory Fitness

- *Define cardiorespiratory fitness*
  - Cardiorespiratory fitness
    - The ability of the heart to deliver oxygen and nutrients to the muscles and remove waste products during physical activity. Involves the circulatory and respiratory systems and their ability to adapt to increased workloads
- *Define benefits of good cardiorespiratory fitness. Understand the results and consequences of poor cardiorespiratory fitness*
  - Benefits
    - Efficient heart
    - Reduced risk of obesity, cancer, and heart disease (diseases of choice)
    - Reduction in premature death
    - Decreased anxiety, fatigue, and depression
    - Improved endurance and skill
    - Better mental/cognitive health
    - Increased quality of life
  - Consequences
    - Increased blood pressure
    - Diseases of choice
    - Death
- *Identify the difference between aerobic and anaerobic training*
  - Aerobic requires oxygen to be delivered to body, converting carbs to energy
    - Prolonged low intensity exercise
      - Ex: walking, biking
  - Anaerobic
    - Inadequate supply of oxygen to the tissues
    - Relying on carbs
    - Short burst of energy
      - Ex: 100 meter sprint
- *What is the F.I.T.T. principle? Describe each portion of the acronym and apply it to your personally*
  - **F**requency
    - Number of exercise sessions per week necessary to improve
  - **I**ntensity
    - Intensity of exercise bout and usually referenced as a percentage of maximum heart rate of as a level of perceived exertion
  - **T**ime
    - Duration of exercise session or total accumulation of exercise minutes over the day
  - **T**ype
    - Type of activity that uses large muscle groups, can be maintained for a given duration, and is rhythmic in nature
  - OPTIONAL → **E**njoyment
- *Understand the difference between Exercise PRescription Model and Lifetime Physical Activity Model*
  - EPM
    - Guideline used to determine FITT needed to achieve cardiorespiratory fitness.
    - Traditionally states that an individual perform cardio 3-5 times/week with approximate intensity of 40-85% of heart rate reserve in one continuous bout of 20-60 minutes
  - LPAM
    - Focus is on amount and type of physical activity needed to produce health benefits, not necessarily skill or performance benefits
- *Understand how cardio fitness can increase quality of life and lower risk of chronic disease*

    - Cardio-fit people have lower risk of all-cause mortality because the leading cause of death in America is cardiovascular disease. Being physically active and consequently physically fit significantly reduces risk for cardiovascular disease death
- *Describe how cardio intensity is measured. Understand how to calculate resting heart rate and maximum heart rate*
    - Intensity is measured using heart rate reserve (HRR). Primary benefit is that it accounts for the individual variability in a person's resting heart rate
    - Resting heart rate (RHR) is a person's heart rate over a minute calculated after a period of rest, hopefully after just waking, before getting out of bed
    - maxHR is the maximum number of heartbeats/min achieved during maximal effort
- *Describe basic anatomy and function of cardiorespiratory system*
    - Made up of cardiovascular and respiratory systems
    - The function of the cardiorespiratory system is to provide the tissues of the body with oxygen, nutrients, protective agents, and a means to remove waste products
    - The more physically fit you are, the more efficiently your cardiorespiratory system works
    - The cardiorespiratory system is comprised of the blood vessels, lungs, and heart
    - Vagus nerve: nerve fibers that control lungs, heart, throat, and intestinal tract; helps regulate pulse rate
    - Heart rate variability (HRV): interval between each heart beat
- *What is VO2max?*
    - VO2max is a measure of the max amount of oxygen a person can use in body tissue, such as working muscle, and is often expressed relative to an individual's body mass at mL*kg-1*min-1 (mL of oxygen per kilogram of body mass per minute)
- *Describe the connection between the mind and cardiorespiratory fitness*
    - Cognitive abilities can be improved through physical activities
    - Physical activity prevents the potential destruction of brain cells from disease and has even been shown to cause new brain cells to grow

LFIT Module 4: Functional Fitness

- *Define functional fitness*
    - The levels of fitness that allow you to perform real-life daily activities such as walking, bending, lifting, and climbing stairs
- *Identify why it is important to establish a functional fitness foundation*
    - The primary purpose of functional fitness is to enhance quality of life, reduce chronic pain, and avoid suffering
- *What does it mean to have good posture?*
    - Good posture is the proper alignment of the musculoskeletal system that allows the body to move according to its designs
    - Normal standing posture involves lining up the eyes, shoulders, hips, knees, and ankles with the right and left sides balanced
- *Understand the benefits of functional fitness*
    - Reduce or eliminate pain
    - Prevent chronic conditions
    - Create your own natural energy
    - Enhance your mental health
    - Future advantages
    - Improve the cardiorespiratory system
    - Increase muscular strength and endurance
    - Become more flexible
- *Understand the neurogenesis process*

    - Neurogenesis is the process of developing new neurons and has been linked to regular physical activity and exercise
- *How to measure the level of functional fitness*
- *Identify practices that best exemplifies functional fitness*
- *Explain where you stand on ethical issues relating to personal fitness*
    - I personally think that natural paths are best for me. I don't disagree that we should experiment to push our natural boundaries through science, but for me my performance isn't as important as my long term health and my desire to live without side effects
- *Know the benefits of flexibility and concerns if muscles become inflexible*
    - Flexibility
        - Facilitates movements needed for everyday activities
        - Required to maintain posture
    - Inflexible muscles
        - Chronic pain, dysfunction, increased risk of injury

LFIT Module 5: Muscular Endurance and Strength/Muscular Fitness