WHAT'S FOR DINNER? NUTRITION AND EXERCISE 101

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DISCLOSURES

- Bariatric Advantage: Consultant
- GainingHealth.com: Founder and Owner

LEARNING OBJECTIVES

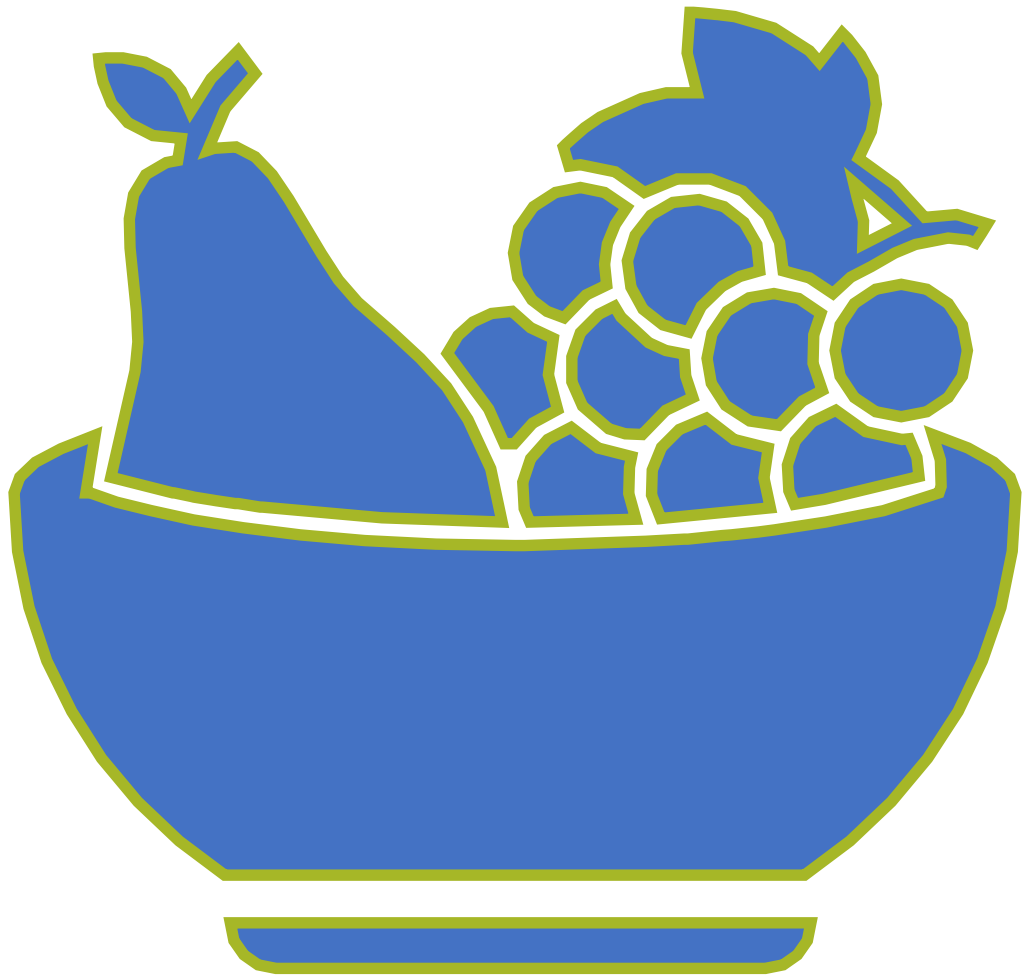
- Define macronutrients and understand the hormonal impact of various macronutrients
- Obtain a proper nutrition history
- Utilize various dietary patterns and understand how they may impact health
- Recognize the impact of physical activity on health
- Obtain a proper physical activity history
- Develop a physical activity plan

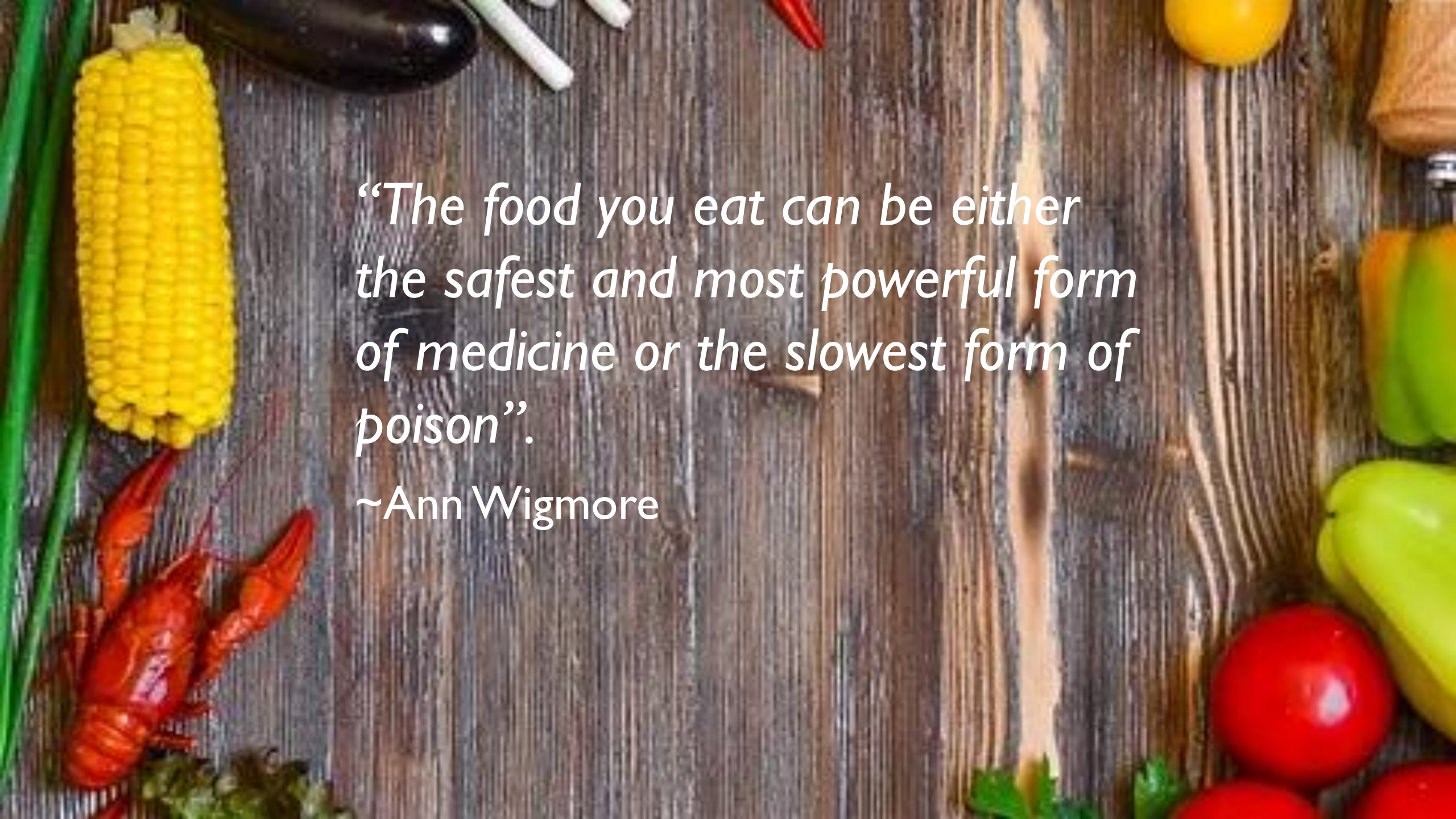
LIFESTYLE IS AT THE ROOT OF ALMOST ALL CHRONIC NON-COMMUNICABLE DISEASES

NUTRITION

"Let Thy Food Be Thy Medicine and Thy Medicine Be Thy Food"

Hippocrates




"The food you eat can be either the safest and most powerful form of medicine or the slowest form of poison".
~Ann Wigmore

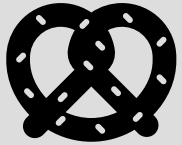
WHAT ARE MACRONUTRIENTS?

Nutrients that provide calories:

- Carbohydrates: 4 kcal/gram
- Protein: 4 kcal/gram
- Fat: 9 kcal/gram
- Alcohol: 7 kcal/gram

ORDER OF SUBSTRATE UTILIZATION

ALCOHOL < GLUCOSE < FAT < PROTEIN

CARBOHYDRATES

Sugars, starches, and fibers, which when digested become monosaccharides (glucose, fructose, galactose)

Energy, structure

Not a necessary macronutrient since liver and kidneys can make glucose

"Carbohydrate deficiency" does not exist

FIBER

Soluble fiber: dissolves in water—forms gel-like substance—feeds gut bacteria

Insoluble fiber: non-water soluble—structure, creates bulk

RDA

- Men: 38 g/day
- Women: 25 g/day

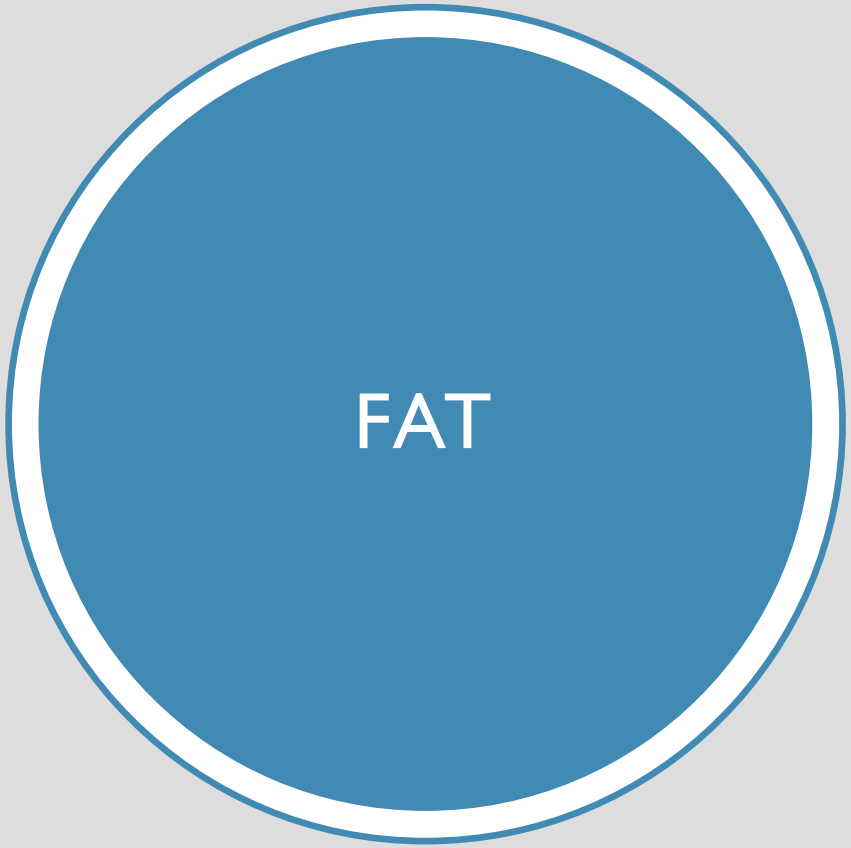
Net carbs = (total carbohydrate) – (fiber)

PROTEIN

- Essential and nonessential amino acids
- Enzymes, hormones, membranes, tissue (skin, muscle, organs): "building blocks"
- Protein deficiency: kwashiorkor
- USDA DRI: 0.8–2.0 g/kg/day, depending on gender, age, physical activity
  - 150 lbs = 68 kg (54.4g -136g)
- Weight loss: 1.2–1.5 g/kg/day

Adapted from 2019 Obesity Algorithm® e-book:

Steelman et al. (2010). *Obesity: Evaluation and treatment essentials*.



- Essential fats: omega-3, omega-6 (polyunsaturated fatty acids)
- Cell membrane, brain (60% fat), hormones, absorption of fat-soluble vitamins (K, A, D, E), energy, insulation, immune system
- USDA DRI: 30 g per day
- Many different kinds of fat: saturated, polyunsaturated, monounsaturated, trans-fat

HORMONAL CONSIDERATIONS

- Insulin is the hormone that controls fat metabolism
- Insulin promotes fat storage (lipogenesis) and prevents fat breakdown (lipolysis)
- Sugars and starches, and to some degree, amino acids, stimulate the secretion of insulin from the pancreas
- A nutrition plan that lowers the amount of insulin secreted is beneficial for weight reduction

HORMONAL CONSIDERATIONS

- Behaviors such as eating and activity are influenced by hormones
- Primary hunger hormone: Ghrelin (stomach)
- Satiety hormones: Leptin (adipose), insulin (pancreas), GLP-1, PYY, CCK, OXM (in gut)
- **GLP-1:** stimulated by monosaccharides, peptides, and amino-acids, monounsaturated and polyunsaturated fatty acids, as well as short chain fatty acids
  - Slows gastric emptying, stimulates satiety in hypothalamus, glucose regulation
  - Foods rich in these nutrients: high-fiber grain products, nuts, avocados, and eggs

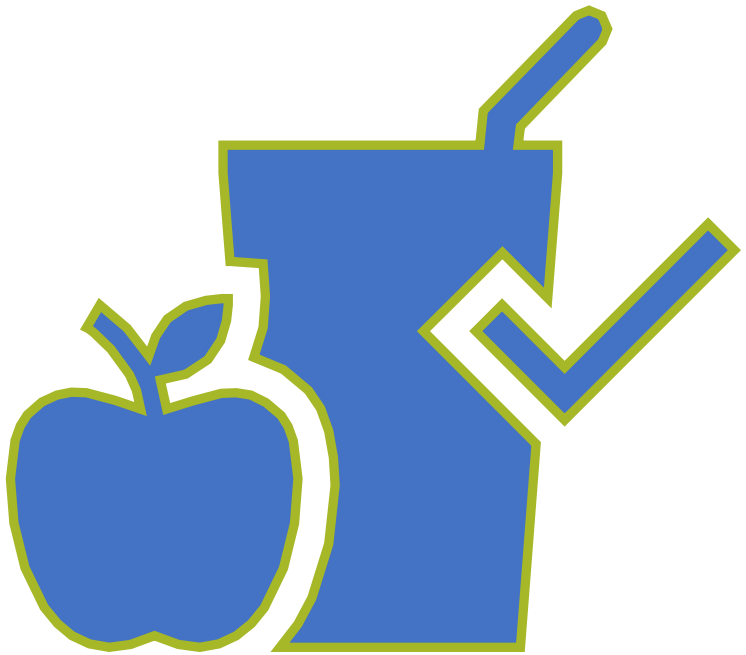
Bodnarus, A. et al. (2016). *Nutrition and Metabolism (London).*

HORMONAL CONSIDERATIONS

- CCK (cholecystokinin): secreted in small intestine in response to amino acids or fatty acids
  - Induces satiety in hypothalamus, stimulates gallbladder contraction, and also slows gastric emptying
- PYY (pancreatic peptide YY): secreted in small intestine in response to amino acids and fat, promotes satiety
  - Decreased PYY, GLP-1, decreased reduction in ghrelin in patients affected by obesity

Karra, E. (2009). *The Journal of Physiology*
https://www.britannica.com/science/cholecystokinin. Accessed 10/01/2019

NUTRITION HISTORY



5A'S OF BEHAVIOR CHANGE

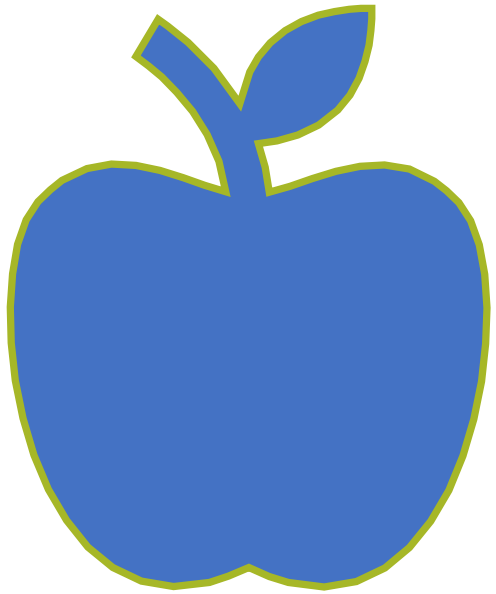
ASK

ASSESS

ADVISE

AGREE

ARRANGE/
ASSIST



ASK FOR PERMISSION TO DISCUSS NUTRITION

"Nutrition plays a very important role in our overall health. Is it okay if we discuss your nutrition today?"

"Nutrition is complex and can be very confusing with all of the things we hear in the media. Can we have a brief conversation about nutrition today?"

If permission granted: "How do you feel about your nutrition?'

"Do you have any questions of concerns about your nutrition?"

"Are there any areas of your nutrition that you struggle with?"

"Would you be interested in us working together on your nutrition?"

ASSESS: NUTRITION HISTORY

Meals and snacks

- Timing?
- Frequency?
- What and how much?
- Where? (location)
- Who prepares/shops for food?

Records

- 24-hour recall
- Food and beverage logs (3 days)
  - Electronic (MyFitnessPal, LoseIt, CarbManager, etc) vs. paper
- Food frequency questionnaires

NUTRITION HISTORY

Behavior

- Triggers: stress, hunger, boredom, lack of satiety or satiation, cravings, time of day
- Barriers: financial, lack of cooking skills, lack of time, cultural/familial, food desserts
- Disordered eating: binge eating, bulimia, night eating syndrome, sleep eating, anorexia

Past history

- Nutrition plans that have worked/not worked in the past
- Preferences
- Likes/dislikes
- Cultural/ Ethical considerations
- Food allergies/ intolerances
- Assess nutrition knowledge

ADVISE

Use Motivational Interviewing!!

Ask the patient how they feel about their nutrition and if there is anything they would like to change

NUTRITIONAL APPROACHES FOR WEIGHT REDUCTION

- Caloric manipulation of macronutrients: carbohydrates or fat
- Low Calorie nutrition plans
  - Women: 1,200–1,500 kcal/day
  - Men: 1,500–1,800 kcal/day
- Meal Replacements and VLCDs: MR can be used with any plan. VLCD = under 800 kcal per day—close medical supervision required

MACRONUTRIENT MANIPULATION

Carbohydrate Restricted

- Under 150 g carbohydrates per day
- Very Low Carbohydrate (LCHF): under 50 g carbohydrates per day
- Greater reduction in triglycerides, serum glucose, hemoglobin A1c, insulin; greater increases in HDL
- In first 6 months, greater weight loss. Usually not Calorie-restricted- reduced hunger
- May induce gout flares early on, May increase LDL
- May increase energy expenditure during weight reduction maintenance
- Examples: Atkins, South Beach, Ketogenic

Fat Restricted

- 10–30% calories from fat
- Under 10% saturated fat
- Greater reduction in LDL cholesterol, BP (DASH)
- May result in greater hunger. Usually Calorie restricted
- After 6 months, similar weight reduction as low carbohydrate
- Examples: DASH, Ornish

Adapted from 2019 Obesity Algorithm® e-book

ADVISE

Limit ultra-processed foods

People eat on average 500 kcals more per day when eating processed vs. whole foods

Encourage whole foods:

Vegetables, fruits, nuts, seeds, meat, poultry, fish, eggs, healthy fats—olive oil, avocado oil, avocados, nuts, unprocessed grains, legumes

Read labels vs. marketing claims

Give resources: websites, hand-outs

Often, people know what they should change, but they don't know HOW and need support, resources, and accountability

Hall et al. Cell Metab. 2019

AGREE

Use Motivational Interviewing and shared decision making to develop a nutrition plan together with your patient

ASSIST/ ARRANGE

- Resources: EatRight.org, NHLBI Portion Distortion, Nutrition.gov, DietDoctor.com, SkinnyTaste.com,Apps: MyFitnessPal, LoseIt, Carb Manager
- Referrals: Commercial plans, Online programs, Registered Dietitians, Obesity Medicine Provider, Community resources

CONCLUSION

- There is no one size fits all nutrition plan!
- Base your nutrition plan on your patient's metabolic profile, medical history, past nutrition history, dietary preferences, cultural and social background, and other factors that may influence their nutrition.
- Adherence is KEY
- Use motivational interviewing and shared decision making to facilitate nutrition behavior change.
- Make appropriate referrals or schedule follow ups if you are managing nutrition.

PHYSICAL ACTIVITY

ACCORDING TO WHO: RISKS OF SEDENTARY LIFESTYLES

2 million deaths per year are attributed to physical inactivity

Among the **10 leading causes of death and disability** in the world

Increases all causes of mortality

Doubles the risk of cardiovascular diseases, diabetes, and obesity

Increases the risks of colon cancer, high blood pressure, osteoporosis, lipid disorders, depression, and anxiety

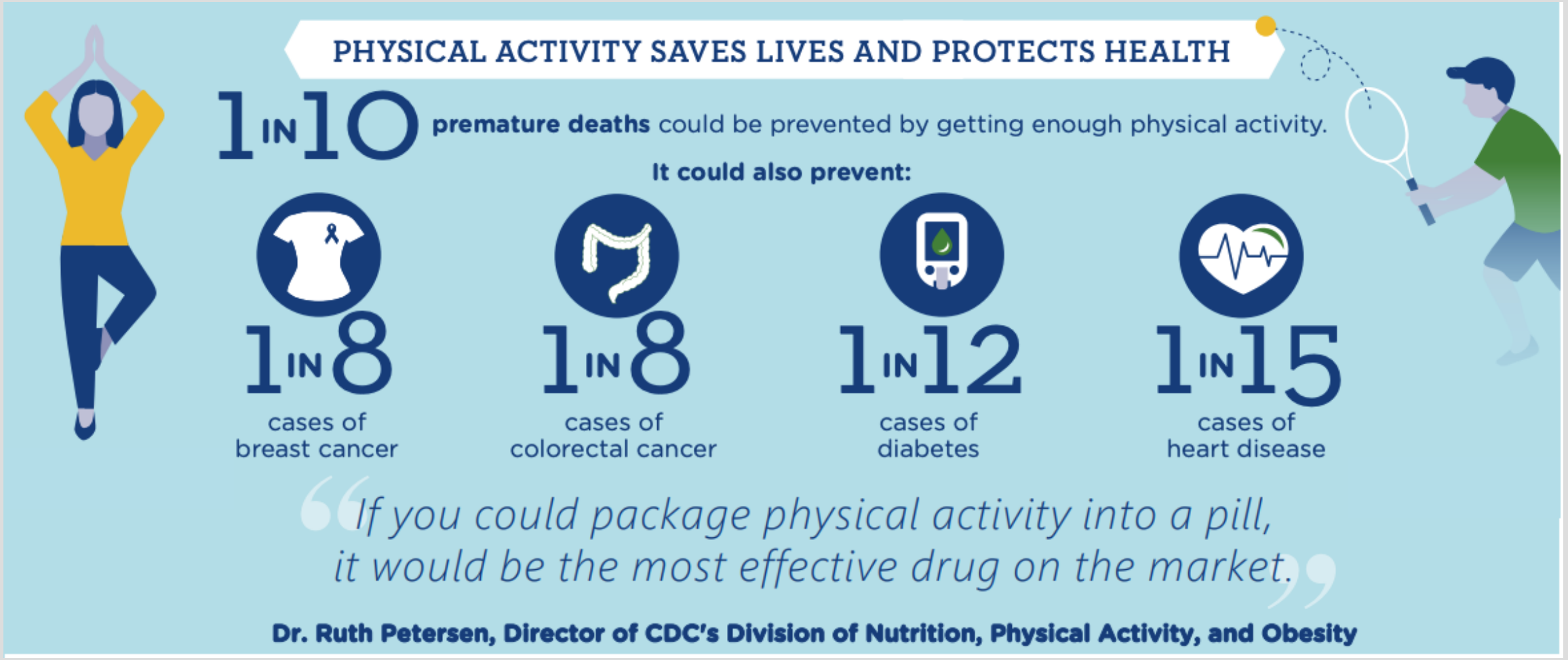
60 to 85% of people in the world lead sedentary lifestyles, making it one of the more serious yet ***insufficiently addressed*** public health problems of our time

CARDIORESPIRATORY FITNESS AND PREMATURE DEATH

- Low cardiorespiratory fitness number one predictor of premature death
  - Smoking, obesity, HTN, hyperlipidemia, diabetes
- High cardiorespiratory fitness is protective against CVD mortality even at high BMIs
- Low cardiorespiratory fitness with low BMI: higher risk for CVD mortality than high BMI with high fitness

Reference: Blair, S .N., 1999; Blair, 2009

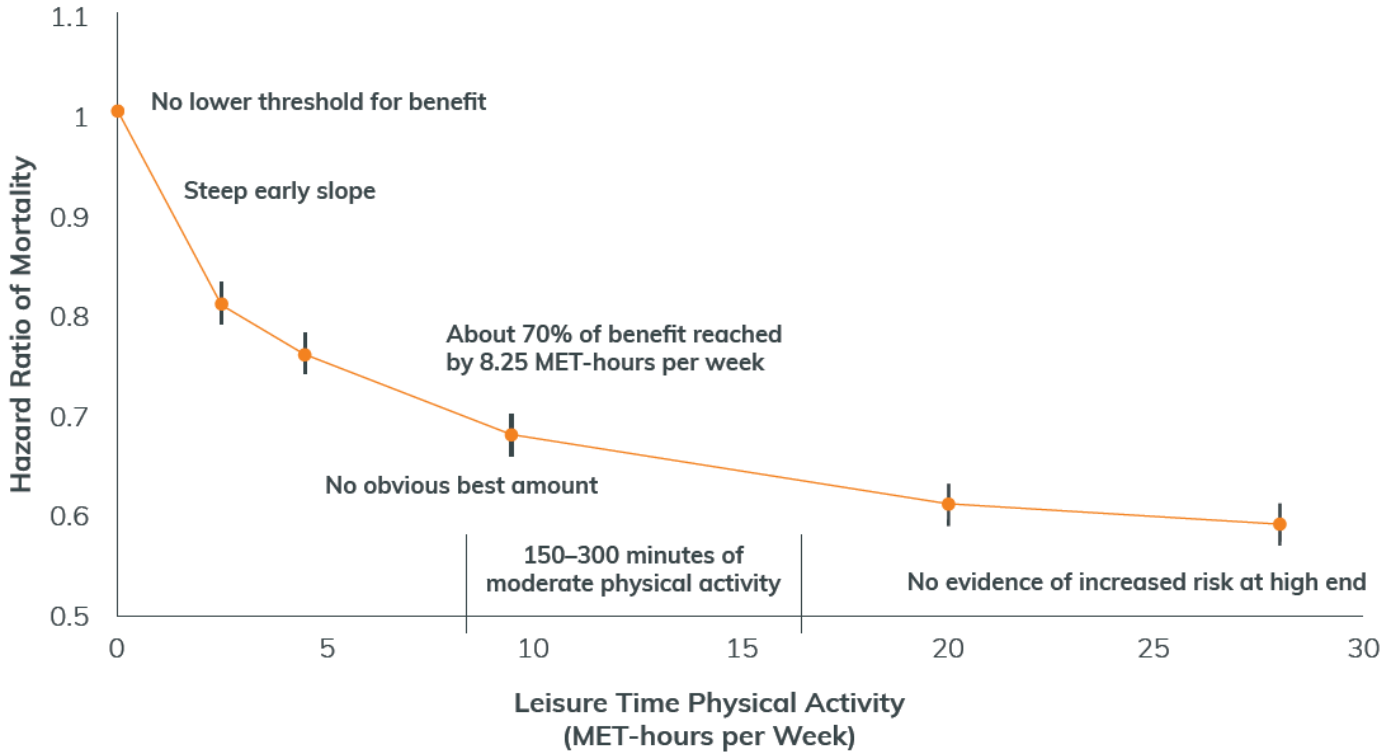
ACCORDING TO THE CDC



https://www.cdc.gov/physicalactivity/about-physical-activity/pdfs/healthy-strong-america-201902_508.pdf

PHYSICAL ACTIVITY AND ALL CAUSE MORTALITY

Figure 2-1. Relationship of Moderate-to-Vigorous Physical Activity to All-Cause Mortality



Source: Adapted from data found in Moore SC, Patel AV, Matthews CE. Leisure time physical activity of moderate to vigorous intensity and mortality: a large pooled cohort analysis. PLoS Med. 2012;9(11):e1001335. doi:10.1371/journal.pmed.1001335.

Source: Physical Activity Guidelines, 2nd Edition, 2018

IMPACT OF SEDENTARY BEHAVIOR

- 80% of adults do not meet the government's national physical activity recommendations for aerobic activity and muscle strengthening.
- Twice as many adults in the United States are physically inactive than smoke cigarettes.
- Approximately 35% of coronary artery disease mortality is due to physical inactivity.
- $117 billion in healthcare costs are associated with inadequate physical activity.
- Regular PA has a profound effect on the expression of our genome and thus on our overall functioning and health.

Resource: The State of Obesity (2016): Physical Inactivity in the Unites States. Retrieved from: https://stateofobesity.org/physical-inactivity/

EXECUTIVE SUMMARY OF SCIENTIFIC REPORT

Benefits

- ***Strong evidence***
  - Improves sleep
  - Improves executive function
  - Reduces depression and depressive symptoms
  - Reduces anxiety
  - Improves perceived quality of life
  - Improves physical function
  - Improves insulin sensitivity

EXECUTIVE SUMMARY OF SCIENTIFIC REPORT

- Prevents or minimizes excessive weight gain in adults and preventing obesity
- Reduces risk of excessive increases in body weight and adiposity in children ages 3 to 17 years
- Pregnancy: less likely to gain excessive weight, develop gestational diabetes, or develop postpartum depression than their less active peers
- Reduces the risk of breast cancer, colon cancer, cancers of the bladder, endometrium, esophagus, kidney, lung, and stomach
- Reduces the risk of developing a new chronic condition, reduces the risk of progression of the condition they already have, and improves their quality of life and physical function

2018 Physical Activity Guidelines Advisory Committee Scientific Report

KEY PHYSICAL ACTIVITY GUIDELINES FOR ADULTS

- At least 150 minutes (2 hours and 30 minutes) to 300 minutes (5 hours) a week of **moderate-intensity**

  Or

- 75 minutes (1 hour and 15 minutes) to 150 minutes (2 hours and 30 minutes) a week of **vigorous-intensity** aerobic physical activity
- Additional health benefits beyond the equivalent of 300 minutes (5 hours) of moderate-intensity physical activity a week
- Spread out throughout the week
- Adults should also do muscle-strengthening activities 2 or more days a week

Adapted from the Physical Activity Guidelines for Americans, 2nd Edition. Available at health.gov/PAGuidelines

HORMONAL REGULATION OF PHYSICAL ACTIVITY

- The hypothalamus plays a central role in the control of physical activity and NEAT (Non-Exercise Activity Thermogenesis).
- Orexin neurons in the hypothalamus integrate physiological and metabolic information and modulate physical activity (also modulate sleep and appetite).
- Overall effect is to increase activity, wakefulness, and appetite.
- Function of the orexin system varies with lifestyle and age, generally decreasing with advancing age.

OREXIN

People with obesity have lower circulating levels of orexin and impaired orexin receptor activity in adipose tissue

Orexin-producing cells are inhibited by leptin and glucose, activated by ghrelin and hypoglycemia

Important link between metabolism and sleep regulation

Adam et al., 2002; Digby et al., 2006; Brisbare-Roch et al., 2007; Inutsuka et al., 2013; Sakurai, 2007

INCORPORATING PHYSICAL ACTIVITY INTO PRACTICE

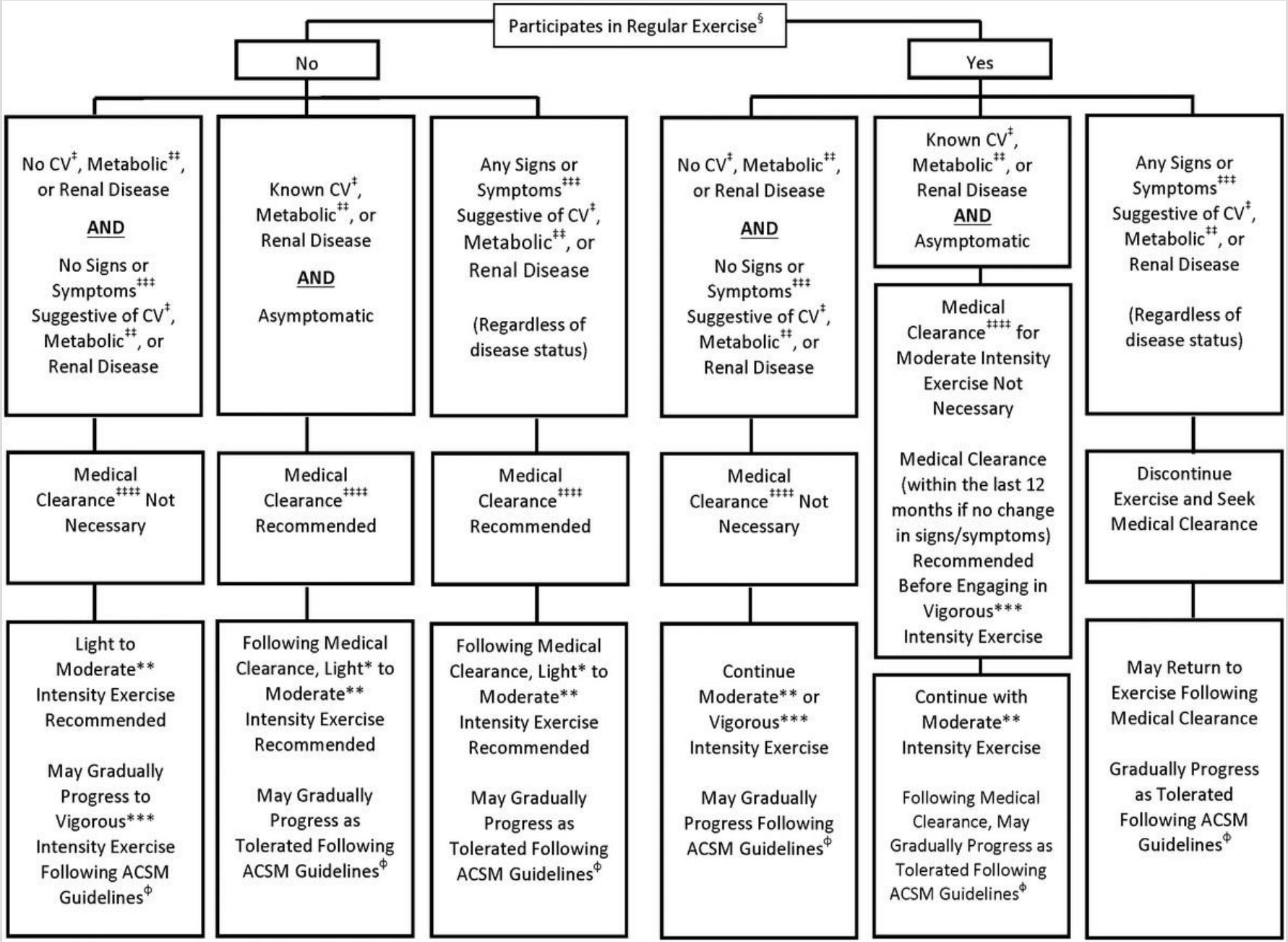
- Ask: "Physical activity is an important component of your overall health. Is it okay if we talk about your physical activity today?"
- Assess: PAVS (physical activity vital sign)
- The PAVS consists of two questions:
  1. "On average, how many days per week do you engage in moderate to strenuous exercise like a brisk walk?"
  2. "On average, how many minutes do you engage in exercise at this level?"

American College of Sports Medicine. (2018). Exercise is medicine. Retrieved from: http://www.exerciseismedicine.org/

PHYSICAL ACTIVITY HISTORY

- Current activity: FITTE (Frequency, Intensity, Type, Time, Enjoyment)
- Previous activities: likes/dislikes
- Reason for discontinuing: When? What? Why?
- Perceived barriers
- Readiness?
- Access to safe places to be active

Image: © Obesity Action Coalition


Participates in Regular Exercise§
No
Yes
No CV‡, Metabolic‡‡, or Renal Disease
AND
No Signs or Symptoms‡‡‡ Suggestive of CV‡, Metabolic‡‡, or Renal Disease
Known CV‡, Metabolic‡‡, or Renal Disease
AND
Asymptomatic
Any Signs or Symptoms‡‡‡ Suggestive of CV‡, Metabolic‡‡, or Renal Disease
(Regardless of disease status)
No CV‡, Metabolic‡‡, or Renal Disease
AND
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Any Signs or Symptoms‡‡‡ Suggestive of CV‡, Metabolic‡‡, or Renal Disease
(Regardless of disease status)
Medical Clearance‡‡‡‡ Not Necessary
Medical Clearance‡‡‡‡ Recommended
Medical Clearance‡‡‡‡ Recommended
Medical Clearance‡‡‡‡ Not Necessary
Medical Clearance‡‡‡‡ for Moderate Intensity Exercise Not Necessary
Medical Clearance (within the last 12 months if no change in signs/symptoms) Recommended Before Engaging in Vigorous*** Intensity Exercise
Discontinue Exercise and Seek Medical Clearance
Light to Moderate** Intensity Exercise Recommended
May Gradually Progress to Vigorous*** Intensity Exercise Following ACSM Guidelines$^{\Phi}$
Following Medical Clearance, Light* to Moderate** Intensity Exercise Recommended
May Gradually Progress as Tolerated Following ACSM Guidelines$^{\Phi}$
Following Medical Clearance, Light* to Moderate** Intensity Exercise Recommended
May Gradually Progress as Tolerated Following ACSM Guidelines$^{\Phi}$
Continue Moderate** or Vigorous*** Intensity Exercise
May Gradually Progress Following ACSM Guidelines$^{\Phi}$
Continue with Moderate** Intensity Exercise
Following Medical Clearance, May Gradually Progress as Tolerated Following ACSM Guidelines$^{\Phi}$
May Return to Exercise Following Medical Clearance
Gradually Progress as Tolerated Following ACSM Guidelines$^{\Phi}$

PHYSICAL ACTIVITY PRESCRIPTION

Based on: readiness to change, medical conditions, barriers, mobility, preferences, etc.

Use Motivational Interviewing!

Agree on SMART goals

FITTE-VP principles

EXAMPLE OF A PA PRESCRIPTION

FITTE-VP: frequency, intensity, type, time, enjoyment, volume, progression

Walk at a brisk pace for 20 minutes

Three times a week: Monday, Wednesday, Friday at 7:00 a.m.

Listen to favorite podcast

Volume: 60 minutes moderate intensity PA per week

Increase by 5 minutes every 2 weeks

ASSIST/ ARRANGE

- Resources:
- https://www.exerciseismedicine.org/
- https://www.nutrition.gov/topics/exercise-and-fitness
- https://www.hhs.gov/fitness/resource-center/physical-activity-resources/index.html
- https://www.cdc.gov/nccdphp/dnpao/state-local-programs/physicalactivity.html
- https://www.nih.gov/health-information/physical-wellness-toolkit-more-resources

DEVELOP YOUR LIST OF LOCAL REFERRALS

- Physical therapists
- Aquatic programs
- Online programs/DVDs
- Community programs
- Exercise physiologists
  - EIM credential program: http://certification.acsm.org/exercise-is-medicine-credential
- Exercise professionals
  - Certified through an NCCA-accredited association

Image: © Obesity Action Coalition

NON-EXERCISE ACTIVITY THERMOGENESIS (NEAT)

- Be aware of **compensation**
- Reduce sedentary time, break up sedentary time
- Promote movement at work, home, active hobbies
- Tracking devices (pedometers, step trackers, fitness trackers, smart watches, smart phones, etc)

CONCLUSION

- Physical activity and physical fitness are crucial components of overall health
- The effects of physical activity are far-reaching and very complex
- Our job as providers
  - Educate our patients on the impact of physical activity
  - Help our patients set realistic goals and expectations
  - Support our patients where they are in their journey in their activity and provide guidance, accountability, and resources

TAKE HOME POINTS

- Nutrition and Physical Activity play a crucial role in health and should be assessed and discussed with patients (with permission).
- Use the 5As as a framework to address health behaviors
- Use Motivational Interviewing and shared decision making when developing a plan and set SMART goals
- When you address lifestyle, you are addressing the root of most chronic medical conditions, and you can **reverse, resolve, and prevent disease**
- This saves you and your patient time and money, while improving your patients' quality and quantity of life and your job satisfaction.
- PEARL from an obesity specialist: Learn how to treat obesity comprehensively with the pillars of obesity treatment: Nutrition, Physical Activity, Behavior Modification, Pharmacotherapy, and Metabolic and Bariatric Surgery

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