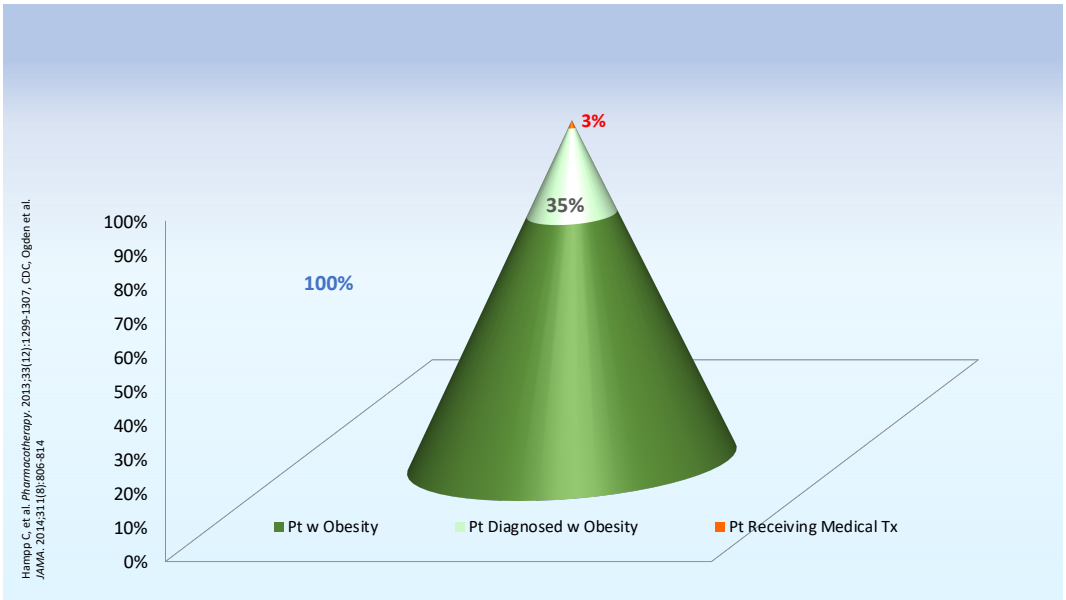
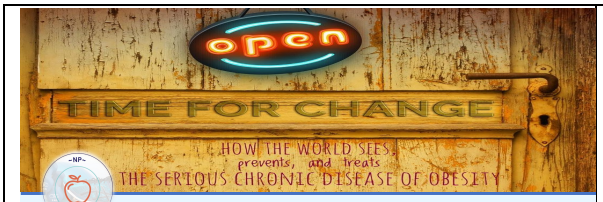
Treating Obesity:
A Workshop for Evidence Based Treatment Workbook

Presented by Dr. Angela Golden
Owner: NP Obesity Treatment Clinic
angie.golden@npobesitytreatment.org

Part 1:
Recognize the burden of obesity as a chronic disease, and the need to overcome barriers to its early diagnosis and treatment.





Angela Golden, DNP, FNP-C, FAANP

Your best weight is the weight you achieve while living the healthiest lifestyle you can truly enjoy.

Objectives

Recognize	• Recognize the burden of obesity as a chronic disease, and the need to overcome barriers to its early diagnosis and treatment
Explain	• Explain the pathophysiologic mechanisms by which excess adiposity occurs and causes obesity-related complications
Implement	• Implement evidence-based guidelines to direct the treatment for the management of obesity
Understand	• Understand basic coding for obesity management
Utilize	• Utilize case studies to apply the learned knowledge related to evidence based treatment for chronic disease of obesity

State of the State

- Current
  - 9 states have rates > 35% adults with obesity
  - 2015-2016 national adult obesity rate was 39.6 percent
  - Almost 50% of Latinos and African American adults have obesity
- Trend forecasts suggest that by 2030, 51% of the population will have obesity (Finkelstein, et al 2012)
- Look at your state
  - https://stop.publichealth.gwu.edu/coverage/medicaid

ARIZONA
Arizona Health Care Cost Containment System (AHCCCS) [9, 10, 11, 12]

Assessment & Counseling

Obesity is not explicitly mentioned

COVERAGE may include:

Preventive Counseling
99401-99404, 99411-99412, 99385-99387, 99395-99397

- AHCCCS covers adult physical examinations and well visits to determine disease risk, provide early detection, and establish a prevention or treatment plan.

Behavioral Assessment/Intervention
96150-96155, S0315-S0316, S9451

- **Health and behavioral assessment/intervention services** [96150-96155] must: (1) utilize cognitive, behavioral, social, and/or psychosocial procedures to address specific physical health problems/treatment; and (2) be delivered by a licensed psychologist, psychiatric nurse practitioner, clinical social worker, marriage/family therapist, or professional counselor.

Nutritional Consultation & Therapy
97802-97804, G0270-G0271

- **Nutritional assessments** are covered for members whose health status may be maintained/improved with nutritional intervention (provided by PCP or RD with referral).

Pharmacotherapy

NOT COVERED

- AZ Medicaid explicitly excludes anti-obesity agents from coverage under the outpatient pharmacy benefit and the FFS Drug List.

Bariatric Surgery

COVERAGE may include:

Gastric Bypass, Gastric Band, Sleeve Gastrectomy

- Prior authorization is required.
  - Determine eligibility and benefits by calling 1-888-788-4408.
  - Initiate a prior authorization request from the **Health Net** Access provider website or by calling 1-888-926-1736.
  - Plan documents indicate that BMI ≥ 35 w/ comorbidity may be required

Adults with obesity: **29%** [3]
Adults with diabetes: **9%** [4]

25% of residents covered by Medicaid/CHIP
$10.6 billion in total Medicaid spending (2015)

93% enrolled in managed care
7% enrolled in fee-for-service [4]

Resources & Contacts:

AZ Department of Insurance
Phone: 800-325-2548

AHCCCS
Phone: 602-417-4000

AZ Department of Health Services
Phone: 602-542-1886

THE GEORGE WASHINGTON UNIVERSITY WASHINGTON, DC

Arizona

STOP Obesity Alliance

Economic

- Estimated National Estimated Costs of Obesity
  - 2008 costs were estimated to be $147 billion (US)
  - 2010 costs were increased to $315.8 billion (US)
  - 2013 costs were $342.2 billion
  - 2014 - global economic impact of obesity was estimated to be US $2.0 trillion
  - 2030 estimates $550 billion billion a year in the U.S.
- Individual
  - $2,741 higher compared to those without obesity

https://www.cdc.gov/obesity/adult/causes.html, Biener, 2017)

Indirect Costs

- Loss of work
  - Absenteeism and presenteeism
  - Cost to productivity $3 – 6 billion/year
- Insurance costs
  - More paid for workers compensation
  - Higher costs d/t ORCs
- Wages
  - Lower for people with obesity

https://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/economic/

Engagement question

- What is bias?
- What is Stigma?

Bias

Courtesy of Canadian Obesity Network

- Weight bias and stigma can
  - impact approach clinically
  - limit reimbursement
- Can keep patients from seeking healthcare
  - resulting in increased morbidity and mortality

Fruh, S. M., Nadglowski, J., Hall, H. R., Davis, S. L., Crook, E. D., & Ziomke, K. (2016). Obesity Stigma and Bias. *The journal for nurse practitioners : JNP, 12*(7), 425–432. doi:10.1016/j.nurpra.2016.05.013
Pearl R L, Wadden TA, Hopkins C, et al (2017). Association between weight bias internalization and metabolic syndrome among treatment-seeking individuals with obesity. Obesity, 25: 317–322.
http://uconn.edu/2017/03/weight-based-stigma-obstacle-sustaining-weight-loss/

Stigma

"Experiencing weight stigma undermines health by contributing to obesity, metabolic disease, psychological disorders, and ultimately mortality."

Courtesy of World Obesity Federation

Himmelstein, M. Puhl , R., & Quinn, D. (2018). Weight stigma in men: What, when and by whom? *Obesity, 90*, 00, 1-9.

People First Language

- People First: Remove the Word "Obese" from Your Dictionary and Language
- Avoid labeling it = bias and discrimination

http://stopobesityalliance.org/wp-content/themes/stopobesityalliance/pdfs/STOP-Provider-Discussion-Tool.pdf

Language

Suggestions From Stop Obesity Alliance

Would it be okay if we discussed your weight?"

"Our measurement indicate that you are carrying excess weight. This can be unhealthy for you and strain your body. If you're interested, we can talk about creating a plan of action together."

Language to use[20]	Language to avoid
Overweight	Fat
Increased BMI	Obese
Unhealthy weight	Diet
Healthier weight	Exercise
Eating habits	
Physical activity	

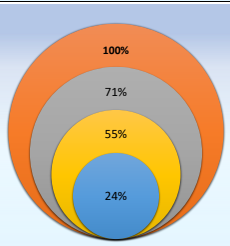
http://stopobesityalliance.org/wp-content/themes/stopobesityalliance/pdfs/STOP-Provider-Discussion-Tool.pdf

Starting that conversation

- "Susan, I am so glad you are here today for your well visit. I see in the chart that your weight has increased over the past few years. Could we talk about this? There are new treatments for the disease of obesity that may benefit you."
- "Hi Mark, it is great you are here today for your blood pressure check and updated visit. We have gone over your labs I would like to review your vital signs as well. One of the measurements shows that it could be impacting your elevated blood pressure. That measurement is your weight. Could we talk about how that can be treated?"
- "Martha, before we finish your visit today I noticed that your weight is increasing. This can be unhealthy for you and may be a part of your knee pain. If you are interested, we can talk about this and I can show you treatment options and we could create a plan of action together."

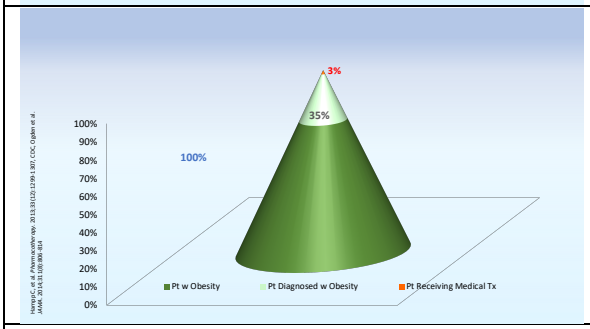
(adapted from http://stopobesityalliance.org/wp-content/themes/stopobesityalliance/pdfs/STOP-Provider-Discussion-Tool.pdf)

- 100% PwO
- 71% had a conversation in the past 5 years with an HCP about their weight
- 55% received a diagnosis
- 24% had a FU scheduled



ACTION STUDY

Kaplan LM, Golden A, Jinnett K, et al. Perceptions of barriers to effective obesity care: results from the national ACTION study. *Obesity (Silver Spring).* 2018;26(1):61-69.



Practice Concepts

- Consider taking the Harvard Implicit Bias test to evaluate yourself for bias. https://implicit.harvard.edu/implicit/Study?tid=-1

Polling question

Which of the following indicated person first language?

a. 28-year-old obese male has severe back pain
b. Experimental group were all overweight adolescents
c. Obese women have more incidence of breast cancer

- Do a scan of your own practice – is there anything that is stigmatizing for patients with obesity. http://www.uconnruddcenter.org/resources/bias_toolkit/toolkit/Module-4/4-02-ChecklistForAssessing.pdf
- Find your personal language for discussing obesity and treatment with weight loss

d. 62-year-old female with obesity arrives for a well woman visit

Explain the pathophysiologic mechanisms by which excess adiposity occurs and causes obesity-related complications.

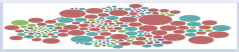
Obesity:
NOT a description. But a Disease *Craig Primack – OMA President 2020*

Definitions

- Obesity is a condition in which fat accumulates in the body to a point where it is a risk factor or marker for a number of chronic diseases including diabetes, cardiovascular diseases (CVDs) and cancer, and has adverse effects on overall health (Tremmel)
- Obesity is a chronic, relapsing, multi-factorial, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences. (OMA)

Tremmel, M., Gerdtham, U. G., Nilsson, P. M., & Saha, S. (2017). Economic Burden of Obesity: A Systematic Literature Review. *International journal of environmental research and public health*, *14*(4), 435. doi:10.3390/ijerph14040435)
https://obesitymedicine.org/what-is-obesity/

Chronic Disease and Obesity

Chronic Disease	Obesity
causes the entire body, an organ or system to malfunction overtime	Structural abnormalities: left ventricular hypertrophy, ectopic fat deposits, lymphedema, and excess or enlarged adipose tissue PwO have shorter lives
has stages and end organ dysfunction	
causes other diseases	236 OAC 
manifested by signs and symptoms.	hyperphagia and in severe disease hyperphagia and hypoventilation syndrome and exercise intolerance insulin resistance, dyslipidemia, chronic inflammation, joint changes, ectopic fat deposits

Diagnosis

Diagnosis

- BMI
  - Non-Asian ≥25 preobesity (overweight), ≥30 obesity
  - Asian ≥23 preobesity (overweight), ≥25 obesity
- Waist circumference
  - Non-Asian > 40 inches in men > 35 inches in women
  - Asian > 35 inches for men > 31.5 inches in women
- Fat percentage
  - Men > 25% defines obesity, 21-25% preobesity
  - Women > 33% defines obesity, 31-33% preobesity

BMI ranges

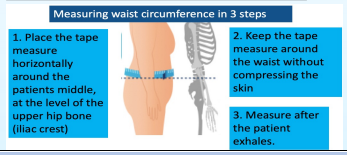
	BMI ranges	
Category	Non-Asian descent	Asian descent
Underweight	< 19 kg/m^2	<18.5 kg/m^2
Normal	20.0 -24.9 kg/m^2	18.5-23.0 kg/m^2
Pre-obesity/ overweight	25-29.9 kg/m^2	23 – 27.5 kg/m^2
Obesity	≥ 30 kg/m^2	≥ 27.5 kg/m^2

WHO staging system for obesity

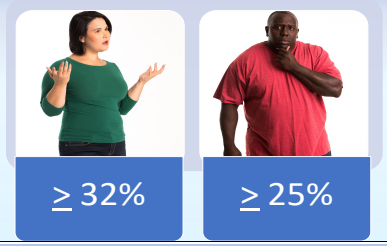
Class	BMI
1	25 to 29.9 kg/m^2
2	30 to 39.9 kg/m^2
3	BMI ≥ 40 kg/m^2

Waist Circumference

Men	Women
≥ 40 inches	≥ 35 inches
≥ 35 inches for Asian men	≥ 31.5 inches for Asian women



Fat Percentage



AACE Staging System for Obesity

Stage	BMI	Complications
0	≥ 25 kg/m^2 to 29.9 kg/m^2 or BMI ≥ 30 kg/m^2	no identified complications
1	≥ 25 kg/m^2	has one or more mild to moderate complications that can be treated effectively by treating obesity
2	≥ 25 kg/m^2	at least one severe complication and may require more aggressive treatment

Edmonton Obesity Staging System

Stage	Obesity Related risk factor	Physical symptoms	Psychological symptoms	Functional limitations
0	None	None	None	None
1	Subclinical risk factors	Mild – no medical treatment needed	Mild	Quality of life not impacted
2	Established ORC with medical intervention	Moderate	Moderate psychological sx (depression, anxiety, eating disorder)	Moderate – QoL is being impacted
3	Significant ORC with end organ damage (MI, heart failure, diabetes with complications)	Significant (incapacitating OA)	Significant (reduced mobility, unable to work or complete ADLs)	Significant – QoL is significantly impacted
4	Severe	or Severe	or Severe	or Severe

Practice Concepts

- Treating obesity can be different
  - First – bias and stigma around the disease, no other chronic disease has this much surrounding it
  - Second – lack of knowledge for patients and clinicians of obesity as a disease

Polling question

Which of the following indicates person with elevated level of adiposity?

a. Waist circumference in 28-year-old African American male of 34”
b. Waist circumference in 28-year-old Asian male of 34”
c. Fat percentage in a woman of 31%
d. Fat percentage in a man of 24%

Polling question

- 36-year-old woman has a BMI of 34.8 and T2DM. This level of obesity would be classified and staged (based on AACE) as:
  a. Class 1, Stage 3
  b. Class 2, Stage 2
  c. Class 3, Stage 0
  d. Class 4, Stage 1

Barriers to managing obesity in primary care

- Number of patients to treat
- Lack of education about what the disease is (and isn't) in your practice for individuals and the overall practice or healthcare system
- Being unaware of the available national guidelines to use to guide treatment
- Patients previous experience of bias and stigma in healthcare settings
- Lack of access to multidisciplinary teams
- Systematic process for making the diagnosis
- Opening the conversation

Physiology

Adipose Tissue

Most prevalent tissue in the body

- regulation of total body energy homeostasis
- temperature regulation
- reproduction
- glucose balance
- immune system

Role of adipose tissue

- storage of extra energy to be used as fuel later
- shock absorber around vital organs
- impacts the vascular system
- appetite regulation

Adipocytes

- release protein and lipids
- produce adiponectin
  - impacts insulin use in the liver
  - decreasing gluconeogenesis
  - antagonizes fat deposition in the liver
- unlimited growth potential throughout life
  - expand in size as they deal with triglyceride …. then…..
  - divide when they reach their maximum size

Hormones

Hunger

- Ghrelin
  - produced by stomach and epsilon cells in pancreas
  - receptors almost everywhere in body
    - especially endocrine tissues
  - Impacts arcuate nucleus among other areas of the brain

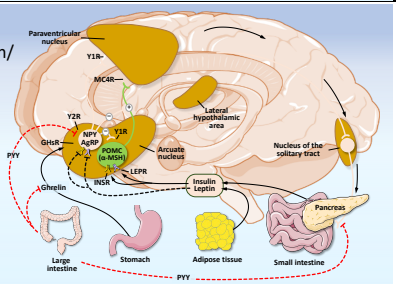
Satiety

- Leptin
  - major role in body weight regulation
  - signals hypothalamus about satiety
- Insulin
  - Messenger for adiposity
- Amylin
- CART, POMC
- NPY, PYY
- GLP-1
  - Produced in small intestine and hindbrain

Components of Appetite Regulation/ Dysregulation

The Hypothalamus Centrally Regulates Weight but is Influenced by Peripheral Signals

Dysregulation of Biosignaling = Obesity



α-MSH, α-melanocyte-stimulating hormone; GHsR, growth hormone secretagogue receptor; INSR, insulin receptor; LEPR, leptin receptor; MC4, melanocortin-4 receptor; POMC, pro-opiomelanocortin; Y1R, NPY Y1 receptor; Y2R, NPY Y2 receptor.

Apovian CM, et al. *J Clin Endocrinol Metab.* 2015;100(2):342-362.

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Practice Concepts

- Understand physiology to understand pathophysiology
- Adipose tissue is important to human survival
- Appetite and weight are tightly regulated just as temperature is regulated

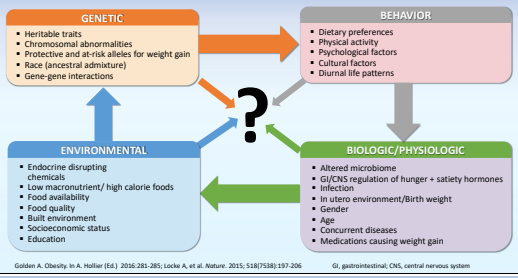
Polling question

Which of the following is the hormone that signals for hunger:

a. Ghrelin
b. Insulin
c. Leptin
d. GLP-1

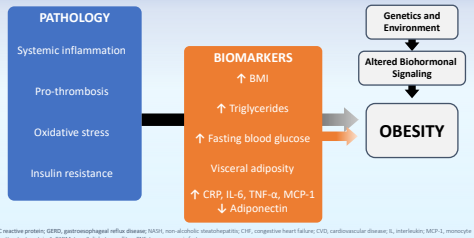
Pathophysiology

Multifactorial Etiology



Golden A. Obesity. In A. Hollier (Ed.) 2016:281-285; Locke A, et al. *Nature*. 2015; 518(7538):197-206 GI, gastrointestinal; CNS, central nervous system

Obesity is a Systemic Inflammatory, Metabolic Disorder



CRP, C reactive protein; GERD, gastroesophageal reflux disease; NASH, non-alcoholic steatohepatitis; CHF, congestive heart failure; CVD, cardiovascular disease; IL, interleukin; MCP-1, monocyte chemoattractant protein-1; T2DM, type 2 diabetes mellitus; TNF, tumor necrosis factor.
Adapted from: Mendrick D, et al. *Toxicol Sci*. 2018;162(1):36-42.

Adipokines

- Cytokines
- Over or underproduction of adipokines
- Examples of Adipokines
  - adiponectin, complement factor C, TNF-a, IL factors and leptin
    - All are pro-inflammatory except adiponectin

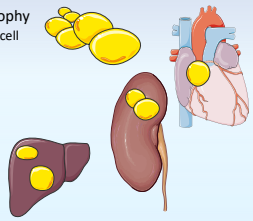
Two interconnected processes

1. Increase amount of adiposity
   - Intertwining of genetics, environment and biology
2. Biological defense of the increased adiposity
   - Evolve slowly over time to create a dysfunction of the adipose tissue

"Growing evidence suggests that obesity is a disorder of the energy homeostasis system". Dr. George Bray

Adiposopathy

- Adipocytes increase through hypertrophy
  - Greater storage of triglycerides in each cell
  - Increase in inflammatory response
  - Less responsive to insulin
- Saturation leads to hyperplasia
- **Deposits ectopically**
  - **Liver, muscles, kidneys and heart**



Weight Regain

- Physiologic response to weight loss = metabolic adaptation
- Weight loss = increased hunger, increased appetite, decreased satiety
  - 24-hour profile of circulating levels of the orexigenic hormone ghrelin and reductions in the levels of the anorexigenic hormones PYY, CCK, leptin, and insulin
- "…once weight has been lost our bodies are wired by the disease to regain the weight." Dr. Garvey

Sumitharin, 2011

Metabolic adaptation

- Hormonal changes that create an environment for weight regain
- Relapsing part of the disease
- Sumitharin (2011) pivotal study
  - Lower levels of satiety hormones and increased hunger hormone
  - Decreasing energy expenditure (adaptive thermogenesis)
- HOWEVER
  - Bluher et al (2012) showed long-lasting improvements even with weight regain after weight loss

"And in the absence of relevant trial data for an individual patient, skilled providers use tacit knowledge to care for people with diabetes."

Semenkovich 2017

The same is true for obesity…

Golden

Practice Concepts

- Need a 60 second prepared explanation of obesity as a disease
  - for patients
  - for your colleagues
- Obesity is heterogenous in its cause – due to multifactorial possible causes
- Inflammation underlies the process of obesity and its complications
- Visceral adiposity leads to ectopic deposits

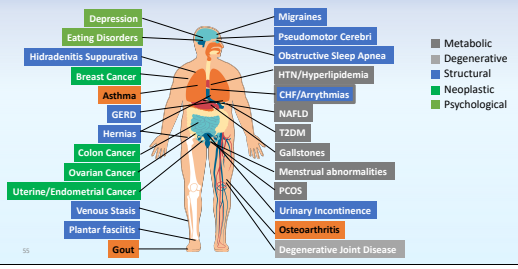
Polling question

Obesity's underlying process of pathophysiology causing complications is:

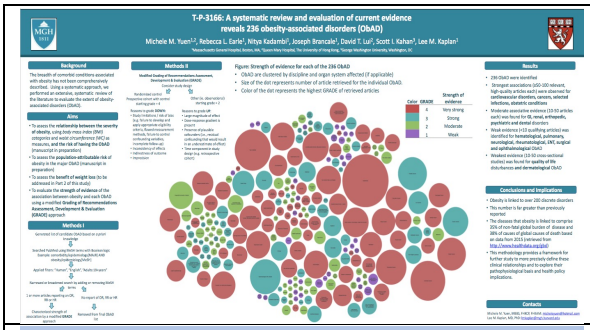
a. Hyperplasia
b. Inflammation
c. Ectopic deposit of fat
d. Increase in the adipokine adiponectin

Complications

Obesity Complications/Comorbidities



Seminal Study



All Cause Mortality

- Adults with obesity
  - die 3.7 years earlier from all causes
  - die 1.6 years earlier from CVD
  - Most at risk adults aged 45 years to 64 years with obesity
    - die up to 12.8 years earlier than those who are at normal weight
- Most, if not all, of these sequelae could be reduced w relatively mod. wt loss of just 5%-10%
  - Stage 2 and 3 obesity were both associated with significantly higher all-cause mortality
  - Overweight was associated with significantly lower all-cause mortality

Flegal, K., Kit, B., Orpana, H., & Graubard, B. (2013). Association of all-cause mortality with overweight and obesity using standard body mass index categories: A systematic review and meta-analysis. *The Journal of the American Medical Association*, *309*(1): 71-82.
Flegal, K., Graubard, B., Williamson, D., & Gail, M. (2007). Excess deaths associated with underweight, overweight, and obesity. *The Journal of the American Medical Association*, *298*(17): 2028-2037.

Obesity Related Cancers

- Pathophysiology: cytokines = chronic inflammation = influencing neoplastic process
- Study of interest:
  - Metabolic Dysregulation and the Risk of Obesity-related Cancers (2013)
    - 4615 participants
    - finding: IFG time exposure > risk of obesity-related cancers, particularly colorectal cancer
- 2004 Dr. Bray wrote about obesity and cancers relationships
- AACE guideline:
  - women with weight-related complications, any weight loss was associated with a 20% reduction in all-cause mortality due to reduced mortality from cancers and diabetes

Pareek, N., Lin, Y., Vadiveloo, M., Hayes, R., & Lu-Yao, G. (2013). Metabolic Dysregulation of the Insulin–Glucose Axis and Risk of Obesity-Related Cancers in the Framingham Heart Study-Offspring Cohort (1971–2008). *Cancer Epidemiology Biomarkers Prevention*, *22*(10), 1825-1836. last accessed August 11, 2017 http://cebp.aacrjournals.org/content/cebp/22/10/1825.full.pdf

IR/Prediabetes/DM

- adipose tissue overwhelmed with FFAs - leads to fatty acid deposition in muscle, liver and pancreatic beta cells
- Leads to decreased insulin sensitivity to glucose and insulin resistance
- Leptin from adipocytes – releases aldosterone causing increase in SNS – increasing angiotension II
- hyperaldosterone leads to insulin resistance
  - IR – prediabetes – DM… Continuum

Poddar, M., Chetty, Y., & Chetty, V. (2017). How does obesity affect the endocrine system? A narrative review. *Clinical Obesity*, *7*:136-144.

Insulin resistance

- Obesity Connection
  - dysfunctional insulin resistant adipocytes
    - diminished ability to store lipids
    - redistribution of fat to the intra-abdominal compartment
    - accumulation of lipid in muscle and hepatocytes
    - cornerstone factor affecting insulin insensitivity is the release of NEFAs

Al-Goblan, A. S., Al-Alfi, M. A., & Khan, M. Z. (2014). Mechanism linking diabetes mellitus and obesity. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, *7*, 587–591. http://doi.org/10.2147/DMSO.S67400

AFib

- Obesity Connection:
  - obesity is correlated with a greater frequency of developing AF
  - risk factors include structural and electrical remodeling of the atria – macro and micro level
- Epicardial Adipose Tissue (EAT) amount contributes thru structural and electrical remodeling of myocardium
  - worsens chronicity, recurrence after ablation and cardioversion and symptom burden
  - induces fibrosis of myocardium – profibrotic mediators (inflammatory cytokines)
  - increases the SNS tone
- Obesity induced hemodynamic changes as well as the low-grade inflammation and oxidative stress add to risk

Mahajan, R., Pathak, R., Thiyagarajah, A., Lau, D., Marchlinski, F., Dixit., S., Day, J., Hendriks, J., Carrington, M., Kalman, J., & Sanders., P. (2017). Risk factor management and atrial fibrillation clinics: Saving the best for last? . *Heart, Lung, and Circulation*, http://dx.doi.org/10.1016/j.hlc.2017.06.123 last accessed August 13, 2017.
Guglielmi, V. & Sbraccia, P. (2017). Epicardial adipose tissue: at the heart of the obesity complications. *Acta Diabetologica*, DOI 10.1007/s00592-017-1020-z

Hypertension

- Obesity connection
  - Excessive reactive oxygen species production
  - abnormal RAAS, especially aldosterone
  - pro-inflammatory signaling
    - monocytes promote the inflammatory response changing the vascular endothelium
    - MCP-1 is elevated and a possible target for treatment
  - reduced nitric oxide bioavailability and activity

Han, T. & Lean, M. (2016). A clinical perspective of obesity, metabolic syndrome and cardiovascular disease. *Journal of the Royal Society of Medicine Cardiovascular Disease*, *5*, 1-13.

Hypertension

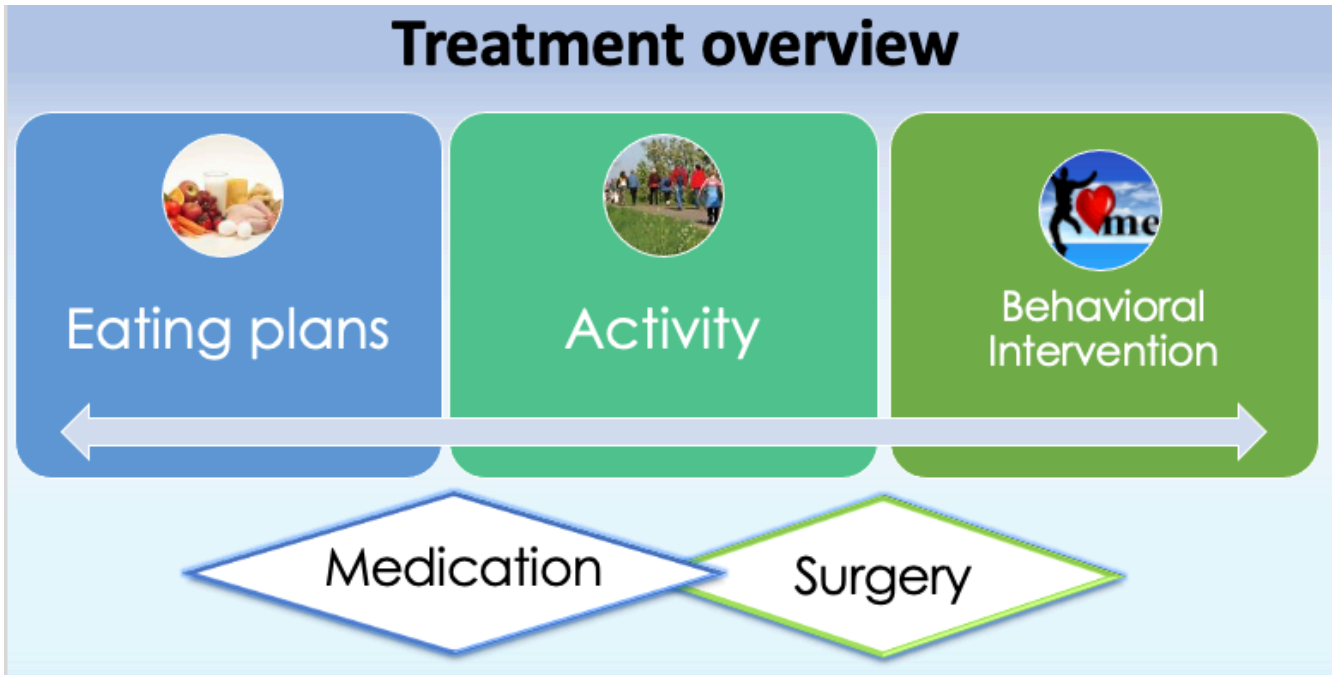
- Obesity connection
  - PVAT – layer of adipose tissue around blood vessels
    - with normal adiposity – primarily anti-contractile enhancing NO bioavailability within endothelium
    - with obesity – reduction in NOS expression in vascular tissues + increase in inflammation (TNF) = increase in oxidative stress and more inflammation so increase in contractile state of vascular bed
  - leptin elevation increases SNS activation in CNS as well as receptors in peripheral endothelium and smooth muscle vasculature – further promotion of inflammation = development of arterial wall stiffening

Polling question

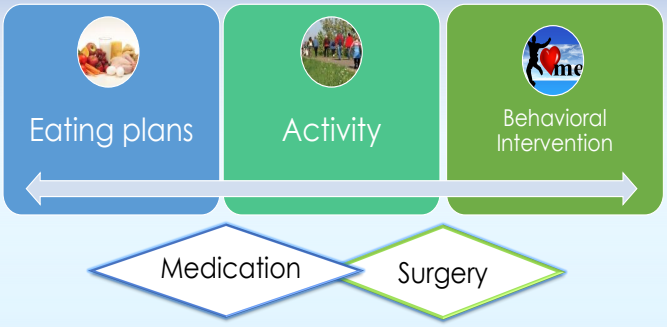
The following is a comorbidity of obesity

a. OA
b. NALFD
c. Depression
d. Dyslipidemia

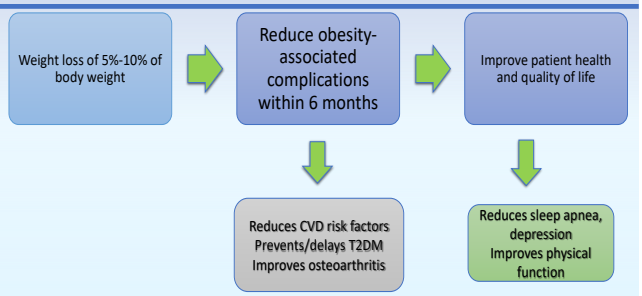
Part 2:
Implement evidence-based guidelines to
direct the treatment for the management of obesity



Treatment overview



Therapeutic Goals



Jensen MD, et al. Circulation 2014;129:S102-S138; Garvey WT, et al. Endocr Pract 2016;22 Suppl 3:1-203.; Yanovski SZ, et al. JAMA 2014;311:74-86; Apovian CM, et al. J Clin Endocrinol Metab 2015;100:342-62

Current Guidelines/Algorithm Comparison

ES	AACE/ACE	OMA	OC
▪ Mention of nutrition, activity, behavioral intervention ▪ Details on available pharmacology for antiobesity medications ▪ Obesogenic medications with options of other choices	▪ Complication-specific treatment guideline ▪ Prevention reviewed ▪ Staged recommendations for treatment ▪ ORC-centric obesity treatment based on pharmacology	▪ Annually updated clinician tool ▪ Review of bias and stigma implications ▪ Podcast companions ▪ Top 10 messages of each section ▪ Obesity myths section	▪ Living document updated with emerging evidence ▪ Created with sections for primary care professions, persons living with obesity, and policy holders ▪ Prevention and treatment ▪ Only 3 medications approved in Canada

ES, Endocrine Society; AACE/ACE, American Association of Clinical Endocrinologists/American College of Endocrinology; OMA, Obesity Medicine Association; OC, Obesity Canada, ORC, obesity-related complications and comorbidities.

5 Apovian CM, et al. *J Clin Endocrinol Metab.* 2015;100(2):342-362; Bays HE, et al. 2020. https://obesitymedicine.org/obesity-algorithm/ Accessed February 12, 2020; Garvey WT, et al. *Endocr Pract.* 2016;22(Suppl 3):1-203; Wharton S, et al. *CMAJ.* 2020;192(31):E875-E891.

Guidelines and components

- No one eating plan fits all – adherence is best predictor
- Physical activity – moves to 200-300 minutes each week for maintenance (150 minutes a week = 10,000 steps a day)
  - Aerobic and anaerobic improve overall health
- Behavioral intervention (intensive lifestyle intervention) – critical to success of first two components
- Medications
  - Review for obesogenic medications
  - Evaluate for use early in treatment

GUIDELINE OVERVIEW RELATED TO COMPONENTS OF TREATMENT

COMPONENT	PURPOSE	TAKE HOME MESSAGE
EATING	Guide to understand various eating plans, no one plan will work for everyone with obesity	When your patient is making a decision, it has to be the eating plan with the patient feels they have the best chance of staying with. This is a perfect example of shared decision-making.
PHYSICAL ACTIVITY	Goal during active treatment 150 minutes/week, increasing to 200-300 minutes/week in maintenance	The first step is getting your patient to move.
MEDICATION	Explain use and safety of medications, use with specific obesity related complications	Begin to evaluate the appropriate use of medication during the intake history and physical.

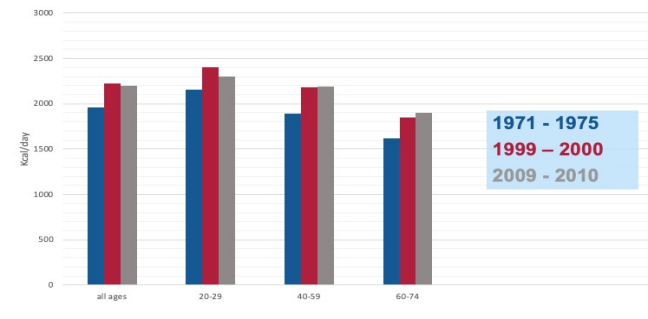
EATING PLANS

Energy balance versus quality aka quantity versus quality

- Academy of Nutrition and Dietetics – need negative energy balance
- OMA, AACE/ACE as organizations: – 500kcal deficit
- 3500 calories = 1 pound
  - from 1958 mathematical calculation (Wishnofsky)
  - nothing in the literature shows this is true (Thomas)

Wishnofsky M. Caloric equivalents of gained or lost weight. ***Am J Clin Nutr***. 1958;6(5):542-546.
Thomas, D. M., Gonzalez, M. C., Pereira, A. Z., Redman, L. M., & Heymsfield, S. B. (2014). Time to correctly predict the amount of weight loss with dieting. *Journal of the Academy of Nutrition and Dietetics, 114*(6), 857–861. https://doi.org/10.1016/j.jand.2014.02.003

TRENDS IN ENERGY INTAKE



Evidence: Ford, E. & Dietz, W. (2013). Trends in energy intake among adults in the United States: findings from NHANES. *American Journal of Clinical Nutrition, 97*(4), 848-853.

And to make it more confusing….

- The FDA allows a 20% margin of error on a label….. So 150 calories is 130-180 HMMMMM
- Macronutrients
  - Carbohydrates, Protein, Fat
- Atwater Factors was meant to be an estimate

Macronutrient	Heat of combustion	Availability	Available Energy
	Kcal/g	%	Kcal/g
Protein	5.65	92	4.0
Fat	9.40	95	8.9
CHO	4.10	97	4.0

https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-guide-developing-and-using-data-bases-nutrition-labeling
Novotny, J. A., Gebauer, S. K., & Baer, D. J. (2012). Discrepancy between the Atwater factor predicted and empirically measured energy values of almonds in human diets. *The American journal of clinical nutrition, 96*(2), 296–301. https://doi.org/10.3945/ajcn.112.035782

Calorie variant issues

- Variable net absorption dependent
  - specific foods eaten
  - how they are prepared
    - Leaving fiber intact versus chopping and/or cooking
    - Cooking increases more available calories from some foods (Groopman)

Groopman, E. E., Carmody, R. N., & Wrangham, R. W. (2015). Cooking increases net energy gain from a lipid-rich food. *American journal of physical anthropology, 156*(1), 11–18. https://doi.org/10.1002/ajpa.22622

Calorie deficit approach

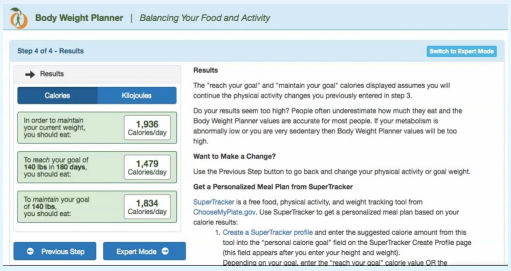
- Calorie deficit verses hormonal approach to obesity treatment
  - Calorie deficit
    - Assumes:
      - eating is all voluntary control
      - and that calories out can be controlled
    - Reducing caloric intake inevitably leads to reduced caloric expenditure ☹

Hormonal Approach

- Obesity as a hormonal dysregulation of adipose accumulation and dysregulation of signaling
  - Insulin
  - Cortisol
  - Leptin, ghrelin, cholecystokinin, peptin YY
  - Adiponectin
  - Hormone sensitive lipase, Lipoprotein lipase, Adipose triglyceride lipase
  - GLP-1

Energy balance versus quality aka quantity versus quality

- New energy balance models
- Trying to be more realistic
  - http://bwsimulator.niddk.nih.gov



Energy balance versus quality aka quantity versus quality

- Example: walk to use 100kcl (1 mile a day)
  - using the NIH – 10-pound loss over 5 years
  - Using 3500 kcal rule – 50lb loss over 5 years (WE WISH)

Evidence: Hall, K., et al. (2012). Consensus Statement: Energy balance and its components: Implications for body weight regulation. *American Journal of Clinical Nutrition, 95,* 989-94.

Energy history: Getting the data

- **24-hour diet recall**
  - PROS: detailed intake data, small burden to patient, literacy not required
  - CONS: requires recall, trained interviewer, possible interviewer bias, can be time consuming, need more than one day to get usual intake
- **3-day diary**
  - PROS: self administered, no interviewer required, no recall bias
  - CONS: large respondent burden, literacy and motivation, possible underreporting
- **Use of one-week application**
  - PROS: detailed intake data, no interview required, no recall bias
  - CONS: literacy, smart phone or computer requirement, later data for provider

Evidence **dietary self-report ….. adequate reliability for most…. regardless of which of the 3 dietary assessment procedures is utilized** Prentice, R. L., Mossavar-Rahmani, Y., Huang, Y., Van Horn, L., Beresford, S., Caan, B., Tinker, L., Schoeller, D., Bingham, S., Eaton, C., Thomson, C., Johnson, D., Ockene, J., Sarto, G., Heiss, G., & Neuhouser, M. (2011). Evaluation and Comparison of Food Records, Recalls, and Frequencies for Energy and Protein Assessment by Using Recovery Biomarkers. *American Journal of Epidemiology,* 174(5), 591–603. http://doi.org/10.1093/aje/kwr140

Assess Confidence

- What is Readiness level
- What is Confidence level
- Need to determine what she thinks is keeping confidence from being higher

Evidence

Macronutrients	Evidence
• Low Fat • Fat intake from to 15-20% of total calories • Example: DASH	shown to decrease total and LDL cholesterol by 10 to 20% Improvement in blood pressure +/- 5-10% weight loss
Low Carb • 20-60 grams of carbohydrates • Example: Ketogenic	Improves metabolic markers insulin levels Hypothesis – decreased carbohydrates causes body to burn stored fat for energy Improves cholesterol levels HDL triglycerides Weight loss of >10% in many studies Increase satiety

Low Fat: Gardner, C. D., et al R. (2016), Weight loss on low-fat vs. low-carbohydrate diets by insulin resistance status among overweight adults and adults with obesity: A randomized pilot trial. Obesity, 24: 79–86. doi:10.1002/oby.21331
Ma, C., et al. (2017). Effects of weight loss interventions for adults who are obese on mortality cardiovascular disease, and cancer: systematic review and meta-analysis. *TheBMJ,* 359:j4849 | doi: 10.1136/bmj.j4849Steinberg D, et al. The DASH Diet, 20 Years Later. *JAMA.* 2017;317(15):1529–1530. doi:10.1001/jama.2017.1628
Low carb Kosinski, C.,&Jornayvaz, F. R. (2017). Effects of Ketogenic Diets on Cardiovascular Risk Factors: Evidence from Animal and Human Studies. *Nutrients,* 9(5), 517. http://doi.org/10.3390/nu9050517

Evidence

• Meal Plans	• Evidence
• **Mediterranean** • Nine dietary components • **Do NOT have:** Sugar-sweetened beverages, added sugars, processed meat, refined grains, refined oils and other highly processed foods.	• **Proposed Benefits** • Improves heart disease • Anti-inflammatory • Protect against dementia, Alzheimer's, Parkinson's • Reduction in all cause death – including cancer • 50-70% reduction in second CV event Predimed Study: 7447 individuals CV risks reduced by 30% even w/o calorie reduction
• **Whole Food/Plant Based**	• Improves metabolic markers • Improves BP • May reduce premature all cause mortality • Decrease visceral adipose tissue

Mediterranean: Lyon Heart Study: 50-70% reduction in second CV event Predimed Study: 7447 individuals CV risks reduced by 30% even w/o calorie reduction
Whole Food/Plant Based:Kim H, Caulfield LE, Rebholz CM: Healthy Plant-Based Diets Are Associated with Lower Risk of All-Cause Mortality in US Adults. J Nutr 2018 148:624-631.

Evidence

Meal Patterning	Evidence

• Alternate Day Fasting
  • Varies from actual fasting to decreased caloric intake on alternate days
  • Zero calories
  • 25% of calorie needs
  • 500-750 calories
	• Decreased inflammatory markers
	• Decreased visceral adipose tissue
	• Improve metabolic profile – reductions in glucose and insulin levels
	• Improve lipid profile
	• Decreased BP
	• Particularly effective for weight loss among middle-aged people

• Intermittent Fasting • 16 hours fasting: 8 hours restricted feeding • 12 hours fasting: 12 hours restricted feeding • 18 hours fasting: 6 hours eating with early eating	• Decreased blood pressure and improved Insulin sensitivity, • Inflammation improved • Improved gut microbiota • Weight loss • Limited data linking intermittent fasting regimens with clinical outcomes, such as diabetes, cardiovascular disease, cancer, or other chronic diseases, such as Alzheimer's disease

ADF: Varady, K., et al. (2009). Short-term modified alternate-day fasting: A novel strategy for weight loss and cardioprotection in obese adults. *American Journal of Clinical Nutrition, 90*, 1138-43.
Intermittent Fasting Patterson, R. & Sears, D. (2017). Metabolic Effects of Intermittent Fasting. *Annual Review of Nutrition, 37*, 371-393. Vaughan, K. & Mattison, J. (2018). Watch the Weight, Not the Scale. *Cell Metabolism, 27*, 1159-1160

Evidence

Energy Focused	Evidence

• LCD
  • 800 – 1600kcal/day
  • Structure can be increased with the use of a meal plan
  • Can be a full meal replacement plan
  • More traditional "dieting" can
  • enhance dietary adherence via portion
  • control, limiting dietary variety, and convenience
  • decrease challenges with making decisions about what to consume
	• Diabetes remission (DIRECT trial)
	• Greater short-term weight loss

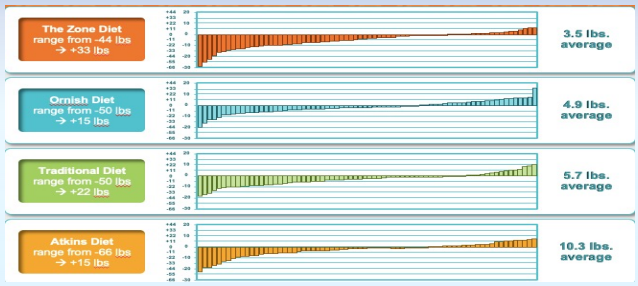
• VLCD
  • Very structured
  • 70-100 g protein/day
  • < 800 kcal/day
  • VLCD likely to need pharmacology support
	• VLCD in people with T2D was associated with significant weight loss, reduction in blood glucose profile and improvement in cardiovascular risk profile (decrease in blood pressure and total cholesterol)
	• VLCDs produce significantly greater weight loss in the short-term initial weight, there was no difference in weight loss between the diets in long- term follow-up

Luckni Sellahewa, Corniche Khan, Sindujah Lakkunarajah and Iskandar Idris, "A Systematic Review of Evidence on the Use of Very Low Calorie Diets in People with Diabetes", Current Diabetes Reviews (2017) 13: 35. https://doi.org/10.2174/1573399812666151005123431

So which for who

- No one plan is the best eating plan – **adherence is the key**
- VLCD
  - Evidence to reverse early Type 2 DM
- Low CHO
  - Lower HgBA1C
- Meal Replacement
  - Short term removal of choices
- Mediterranean
  - Improvement in Chronic Diseases

A – Z study



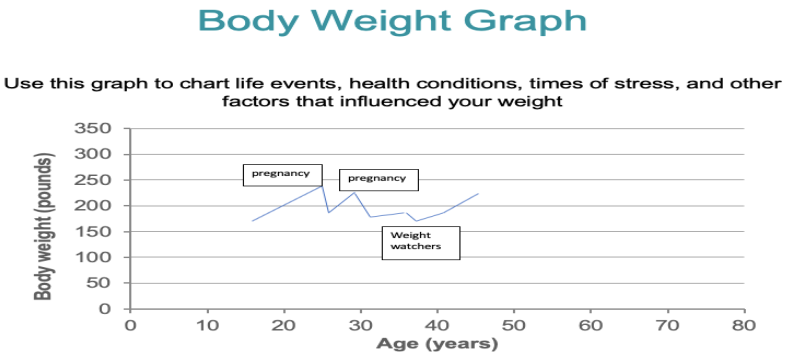
Gardner CD, Kiazand A, Alhassan S, Kim S, Stafford RS, Balise RR, Kraemer HC, King AC. Comparison of the Atkins, Zone, Ornish, and LEARN diets for change in weight and related risk factors among overweight premenopausal women: the A TO Z Weight Loss Study: a randomized trial. JAMA. 2007 Mar 7;297(9):969-77. doi: 10.1001/jama.297.9.969. Erratum in: JAMA. 2007 Jul 11;298(2):178. PMID: 17341711.

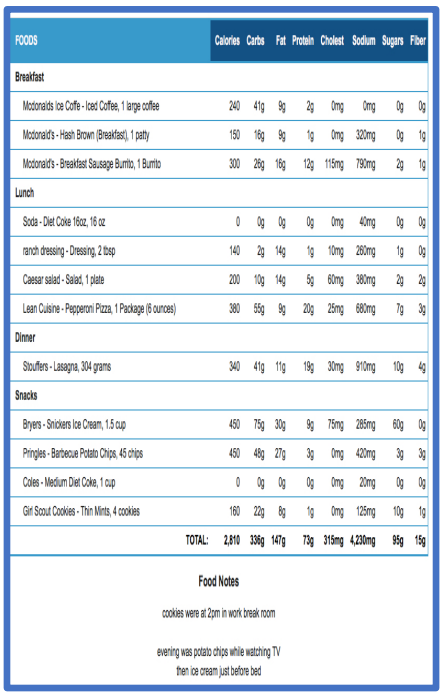
Guiding principles for starting nutrition as therapy in the management of obesity

- **Practice Concepts**From National Weight Control Registry
- Eat breakfast every day
- Watch less than 10 hours of TV
- Regular consumption of no calorie sweetened beverage consumption is common
- Eat 5 small meals a day

	• Eat high fiber, low processed foods • Breakfast • Start with 30 gm of protein to decrease ghrelin through the day

Case Study
46-year-old female
VS: 5'4" 212# 142/88 HR 78 RR 16 pOx 98
BMI: 36.30 kg/m^2 Body Fat 41.1%
Waist circumference: 42"
Neck circumference: 15"
Liver percussion 14 cm percussed at MCL
Most recent labs: triglycerides 174, TC 236, LDL 134, HDL 48, AST 67, ALT 102, Vit D 34
Additionally fasting insulin 18, glucose 94 – HOMA IR is 4.17 – QUICKI 0.31. HGBA1C 5.6
Staging of obesity
WHO Obesity Class II
EOSS – Stage 2
AACE/ACE – Stage 2



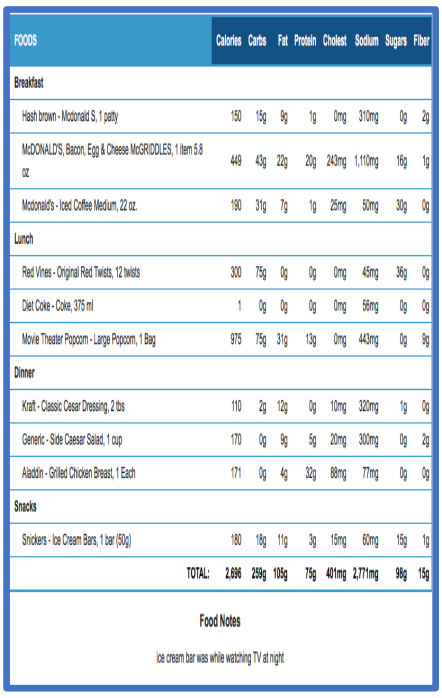


FOODS	Calories	Carbs	Fat	Protein	Cholest	Sodium	Sugars	Fiber
Breakfast								
Mcdonalds Ice Coffe - Iced Coffee, 1 large coffee	240	41g	9g	2g	0mg	0mg	0g	0g
Mcdonald's - Hash Brown (Breakfast), 1 patty	150	16g	9g	1g	0mg	320mg	0g	1g
Mcdonald's - Breakfast Sausage Burrito, 1 Burrito	300	26g	16g	12g	115mg	790mg	2g	1g
Lunch								
Soda - Diet Coke 16oz, 16 oz	0	0g	0g	0g	0mg	40mg	0g	0g
ranch dressing - Dressing, 2 tbsp	140	2g	14g	1g	10mg	260mg	1g	0g
Caesar salad - Salad, 1 plate	200	10g	14g	5g	60mg	380mg	2g	2g
Lean Cuisine - Pepperoni Pizza, 1 Package (6 ounces)	380	55g	9g	20g	25mg	680mg	7g	3g
Dinner								
Stouffers - Lasagna, 304 grams	340	41g	11g	19g	30mg	910mg	10g	4g
Snacks								
Bryers - Snickers Ice Cream, 1.5 cup	450	75g	30g	9g	75mg	285mg	60g	0g
Pringles - Barbecue Potato Chips, 45 chips	450	48g	27g	3g	0mg	420mg	3g	3g
Coles - Medium Diet Coke, 1 cup	0	0g	0g	0g	0mg	20mg	0g	0g
Girl Scout Cookies - Thin Mints, 4 cookies	160	22g	8g	1g	0mg	125mg	10g	1g
TOTAL:	2,810	336g	147g	73g	315mg	4,230mg	95g	15g

Food Notes

cookies were at 2pm in work break room

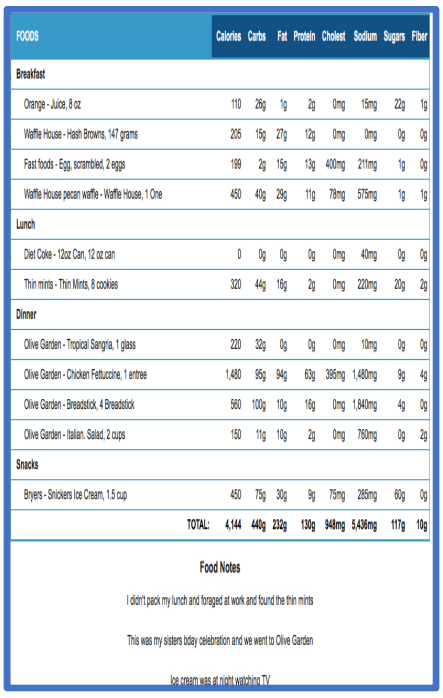
evening was potato chips while watching TV
then ice cream just before bed



FOODS	Calories	Carbs	Fat	Protein	Cholest	Sodium	Sugars	Fiber
Breakfast								
Hash brown - Mcdonald S, 1 patty	150	15g	9g	1g	0mg	310mg	0g	2g
McDONALD'S, Bacon, Egg & Cheese McGRIDDLES, 1 Item 5.8 oz	449	43g	22g	20g	243mg	1,110mg	16g	1g
Mcdonald's - Iced Coffee Medium, 22 oz.	190	31g	7g	1g	25mg	50mg	30g	0g
Lunch								
Red Vines - Original Red Twists, 12 twists	300	75g	0g	0g	0mg	45mg	36g	0g
Diet Coke - Coke, 375 ml	1	0g	0g	0g	0mg	56mg	0g	0g
Movie Theater Popcorn - Large Popcorn, 1 Bag	975	75g	31g	13g	0mg	443mg	0g	9g
Dinner								
Kraft - Classic Cesar Dressing, 2 tbs	110	2g	12g	0g	10mg	320mg	1g	0g
Generic - Side Caesar Salad, 1 cup	170	0g	9g	5g	20mg	300mg	0g	2g
Aladdin - Grilled Chicken Breast, 1 Each	171	0g	4g	32g	88mg	77mg	0g	0g
Snacks								
Snickers - Ice Cream Bars, 1 bar (50g)	180	18g	11g	3g	15mg	80mg	15g	1g
TOTAL:	2,696	259g	105g	75g	401mg	2,771mg	98g	15g

Food Notes

ice cream bar was while watching TV at night



FOODS	Calories	Carbs	Fat	Protein	Cholest	Sodium	Sugars	Fiber
Breakfast								
Orange - Juice, 8 oz	110	26g	1g	2g	0mg	15mg	22g	1g
Waffle House - Hash Browns, 147 grams	205	15g	27g	12g	0mg	0mg	0g	0g
Fast foods - Egg, scrambled, 2 eggs	199	2g	15g	13g	400mg	211mg	1g	0g
Waffle House pecan waffle - Waffle House, 1 One	450	40g	29g	11g	78mg	575mg	1g	1g
Lunch								
Diet Coke - 12oz Can, 12 oz can	0	0g	0g	0g	0mg	40mg	0g	0g
Thin mints - Thin Mints, 8 cookies	320	44g	16g	2g	0mg	220mg	20g	2g
Dinner								
Olive Garden - Tropical Sangria, 1 glass	220	32g	0g	0g	0mg	10mg	0g	0g
Olive Garden - Chicken Fettuccine, 1 entree	1,480	95g	94g	63g	395mg	1,480mg	9g	4g
Olive Garden - Breadstick, 4 Breadstick	560	100g	10g	16g	0mg	1,840mg	4g	0g
Olive Garden - Italian. Salad, 2 cups	150	11g	10g	2g	0mg	760mg	0g	2g
Snacks								
Bryers - Snickers Ice Cream, 1.5 cup	450	75g	30g	9g	75mg	285mg	60g	0g
TOTAL:	4,144	440g	232g	130g	948mg	5,436mg	117g	10g

Food Notes

I didn't pack my lunch and foraged at work and found the thin mints

This was my sisters bday celebration and we went to Olive Garden

Ice cream was at night watching TV

Assess Confidence

- Need to determine what she thinks is keeping her from being an 8 in confidence
  - Lack of previous success
    - Talk about weight regain as physiology
    - Evidence of program support
  - Ask again – now a 6

- What is Readiness level
  - Susan answered 8

- What is Confidence level

  - Susan answered 4

Polling question What changes would you recommend first a. Limit portions b. Reduce eating out c. Decrease carbohydrates d. Decrease energy dense (processed) foods e. Make substitution choices at restaurants	What plan will you recommend to this patient? Why? a. Low Fat b. Mediterranean c. Low carbohydrate d. Plant Based Whole Food e. Alternate day fasting f. Intermittent fasting g. Low Calorie Diet (LCD) h. Very Low-Calorie Diet (VLCD) i. Modifications of current eating
What goals would you set for the next visit?	

Physical Activity

Physical Activity Pillar

- Physical activity may not be integral to the active phase of obesity treatment
- Many benefits
  - increases metabolic health
  - supports maintenance of weight loss
  - improves body composition
  - improves insulin sensitivity
- Exercise without eating changes is ineffective
- Wiklund (2016) showed physical activity has not declined since the 1980s
- **Clearly this is not a sole answer to the treatment of obesity**

Wiklund P. The role of physical activity and exercise in obesity and weight management: Time for critical appraisal. J Sport Health Sci. 2016 Jun;5(2):151-154. doi: 10.1016/j.jshs.2016.04.001. Epub 2016 Apr 8. PMID: 30356545; PMCID: PMC6188737.

Pre-Activity Assessment

- Before prescribing an activity plan
  - Pre-exercise physical assessment
    - **Physical Activity Readiness Questionnaire (PARQ)**
      - 7-question screening tool
      - Symptoms of heart disease and MS issues
      - Yes to any question – MAY need further evaluation
    - **Mobility Assessment**
      - Assess mobility, balance and gait
      - Any concerns refer to PT for evaluation

	Yes	No
Has your MP or provider said that you have a heart condition OR high blood pressure	X	
Do you feel pain in your chest at rest, during your daily activities of living OR when you do physical activity		X
Do you lose balance because of dizziness OR have you lost consciousness in the last 12 months? (answer no if your dizziness was associated with over-breathing – including during vigorous exercise)		X
Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? Please list condition(s) here: _____		X
Are you currently taking prescribed medications for a chronic medical condition? Please list conditions and medications here: _____		X
Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? Please answer NO if you had a problem in the past, but it **does not limit your current ability** to be physically active. **Please list conditions here:** _____		X
Has your MP or physician ever said that you should only do medically supervised physical activity?		X

Pre-exercise physical assessment

- **Medical testing**
  - Possible cardiac stress test, pulmonary function test, or MS assessment
- **Access Evaluation**
  - Ask about barrier to physical activity: ex: safe areas, financial ability for classes
- **Readiness to Change**

Physical Activity Pillar

- Assessing current physical activity
  - Describe physical activity at work or school and leisure
  - Could also check on pedometer for step counts

Activity	Description leisure	Description – work
Very Light	Almost no activity at al	Sitting at the computer most of the day, or sitting at a desk.
Light	Walking, non-strenuous cycling or gardening approximately once a week.	Light industrial work, sales or office work that comprises light activities.
Moderate	Regular activity at least once a week, e.g., walking, bicycling (including to work) or gardening.	Cleaning, kitchen staff, or delivering mail on foot or by bicycle.
Heavy/Active	Regular activities more than once a week, e.g., intense walking, bicycling or sports.	Heavy industrial work, construction work or farming.

Activity

- **Active treatment**
  - Guidelines: All have activity at 150 minutes/week despite the lack of evidence for significant weight loss
  - 10-minute walks immediately after meals (vs 30 minutes a day)
    - Decrease in BS post prandial esp. after dinner
    - Increases insulin sensitivity

Activity for Maintenance

250-400 minutes a week may be needed above baseline
So important to start early to increase

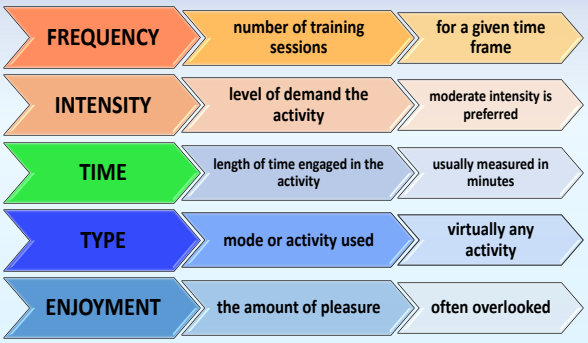
Reynolds, A.N., Mann, J.I., Williams, S. et al. Diabetologia Advice to walk after meals is more effective for lowering postprandial glycaemia in type 2 diabetes mellitus than advice that does not specify timing: a randomised crossover study (2016) 59: 2572. https://doi.org/10.1007/s00125-016-4085-2

Resistance training

- Pros
  - Improves lean mass
    - May decrease visceral adipose tissue
  - Possibly improve glycemic control, blood lipids
- Cons
  - Time consuming
  - Requires equipment
  - Can cause harm if not done correctly

Evidence:
- Strasser, B. & Schobersberger, W. (2011). Evidence for Resistance Training as a Treatment Therapy in Obesity. *Journal of Obesity*, 2011, Article ID 482564, 9 pages, 2011. doi:10.1155/2011/482564. *RT is considered a potential adjunct in the treatment of metabolic disorders by decreasing known major risk factors for metabolic syndromes. As such, RT is recommended in the management of obesity and metabolic disorders*
- Bales, C. W., Hawk, V. H., Granville, E. O., Rose, S. B., Shields, T., Bateman, L., Willis, L., Piner, L., Slentz, C., Houmard, J., Gallup, D., Samsa, G., & Kraus, W. E. (2012). Aerobic and Resistance Training Effects on Energy Intake: The STRRIDE AT/RT Study: Exercise Training Effects on Energy Intake. *Medicine and Science in Sports and Exercise*, *44*(10), 2033–2039. http://doi.org/10.1249/MSS.0b013e318259479a. *Balancing time commitments against health benefits, it appears that AT is the optimal mode of exercise for reducing fat mass and body mass, while a program including RT is needed for increasing lean mass in middle-aged, overweight/obese individuals.*

Physical Activity Prescription – F.I.T.T.E.



Practice Concepts

- Assessing patient's physical ability and safety is the 1st step
- Next assess baseline of activity, increase slowly with the goal of long term being 200-300 minutes a week
- Write the physical activity as a prescription for the patient using F.I.T.T.E.
- In my clinical practice I generally start with simple step counting. Most everyone can afford a pedometer, or their phone can track steps. If they don't have a safe place or they have inclement weather many malls allow walkers and often there are places at their work sites they can walk
- Increase physical activity through shared decision making so that it is ENJOYABLE and the patient will have a greater chance of sticking with the plan. Listening to a book may make a walk enjoyable for someone that

Susan's Perspective

Reminder
VS: 5'4" 212# 142/88 HR 78 RR 16 pOx 98

	Yes	No
Has your NP or provider said that you have a heart condition OR high blood pressure	X	
Do you feel pain in your chest at rest, during your daily activities of living OR when you do physical activity		X
Do you lose balance because of dizziness OR have you lost consciousness in the last 12 months? (answer no if your dizziness was associated with over-breathing – including during vigorous exercise)		X
Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? Please list condition(s) here: _____		X
Are you currently taking prescribed medications for a chronic medical condition? Please list conditions and medications here: _____		X
Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? Please answer NO if you had a problem in the past, but it **does not limit your current ability** to be physically active. **Please list conditions here:** _____		X
Has your NP or physician ever said that you should only do medically supervised physical activity?		X

Polling question

Which of the following would you recommend at this point for the foundational component of activity for Susan?

a. Nothing, she isn't ready
b. Get a baseline with a step counter
c. Ask if there are any activities she enjoys
d. Nothing, she needs referred to cardiology

Behavioral Intervention

What is behavioral intervention

- Education, goal setting, evaluation of successes and any difficulties
- Intensive Behavior Therapy (IBT) or Intensive Lifestyle Intervention (ILI)
- Evidence for primary
  - LookAhead trial (LookAhead Research Group, 2006)
  - Diabetes Prevention Program (CDC, 2018)
  - Canadian Obesity Network (Obesity Canada, 2021.).

So is there a problem?

- 32,519 records reviewed
- Weight loss counseling for patients with obesity patients declined from 39.9% to 29.9%, a 41% decrease from 1995-96 to 2007-08
- Just looking at counseling for "diet and exercise" for any reason
  - declined 16.3% to 11.3% significantly between 1995–1996 and 2007–2008

- Evidence: Kraschnewski, J.., Sciamanna, C., Stuckey, H. Chuang, C., Lehman, E., Hwang, K., Sherwood, L., & Nembhard, H. (2013). A silent response to the obesity epidemic: Decline in US physician Weight counseling, *Medical Care*, *51*, 186-192.

Foundational component of behavioral treatment

- **Eating plan prescription**
  - Evidence: **All diets will produce weight loss, regardless of their macronutrient composition, if consistent** (POUNDS Lost Study https://www.nhlbi.nih.gov/research/resources/obesity/completed/pounds-lost.htm)
- **Physical activity prescription**
  - Gradually increase physical activity over 6 months for maintenance phase of high levels

Pillar of behavioral treatment

- **Self Monitoring**
  - Identifies patterns, targets for changes, progress in meeting goals
  - Evidence: **More frequent monitoring = greater weight loss**
    (Wing RR, Tate DF, Gorin AA, et al. A self-regulation program for maintenance of weight loss. N Engl J Med 2006;355:1563–71.)
- **Guided Goal Setting**
  - Objective, measurable goals
- **Problem solving**
  - Analyze challenges – look for solutions and reset goal

Behavioral Interventions - Motivational Interviewing

- 5 As
  - Counseling for obesity
    - Ask, assess, advise, agree and assist
  - Medicare IBT
    - Assess, advise, agree, assist, arrange
- Evidence: **Motivational interviewing was associated with a greater reduction in body mass compared to controls**

Armstrong et al. (2011), Motivational interviewing to improve weight loss in overweight and/or obese patients: a systematic review and meta-analysis of randomized controlled trials. Obesity Reviews, 12: 709–723. doi: 10.1111/j.1467-789X.2011.00892.

Motivational interviewing

Not at all ready	1	2	3	4	5	6	7	8	9	10	Very Ready

- collaborative conversation style
- strengthening a person's own motivation and commitment to change.
- **not** to convince people to do what you think is best for their health

- discover and activate the patient's motivations
- not the provider's motivations

Behavioral Interventions – Goal Setting

Mindfulness

- Cultivates awareness of present-moment experience with a non judging attitude
- Promote adaptive self-regulation
- Maintaining long-term eating habits, particularly in the face of stress
- Improve eating behaviors, weight management, and metabolic health
- Evidence: **Helpful instructors led to 5.4 kg weight loss over 18 months, decrease in triglycerides, fasting glucose, c-reactive protein and HOMA**

Daubenmier, J., et al. (2016). Effects of a mindfulness-based weight loss intervention in adults with obesity: A randomized clinical trial. *Obesity (Silver Spring, Md.)*, *24*(4), 794–804. http://doi.org/10.1002/oby.21396.

Mindful Eating Strategies

1. Take five deep breaths prior to each meal.
2. Sit down while eating.
3. Place your food on an attractive plate or bowl.
4. Eat slowly and taste each bite.
5. Take small bites.
6. Honor your hunger cues, and do not fear hunger.
7. Pay attention to satiety cues.
8. Once you begin to feel satisfied, stop eating.
9. Eat without distraction.
10. Carry foods with you that you like and that support your health, in the event that you become hungry when you are out.
11. Sip warm tea or water prior to a meal to calm your body.

adapted from Obesity Action Coalition

Tracking of eating or activity

- How
  - Eating: Apps/paper/bite counter
  - Activity: Worn devices/logging
- Advantage
  - Self Efficacy
  - Goal attainment reinforcement
- Tools to track activity
  - Pedometers
  - Wearables
  - Smart phone apps
- Data
  - 1 in 6 adults have a "wearable"
  - pedometers has been associated with significant increases in physical activity
  - 32% of users stop wearing these devices after six months, and 50% after one year

- Evidence:
  - Physical Activity app uses did more intentional activity and had a lower BMI at 6 months than those with app monitoring
  - Eating monitoring did not differ in frequency between paper, app or website, however app users consumed less at the 6-month ending.

Goldstein, C. M., Thomas, J. G., Wing, R. R.,&Bond, D. S. (2017). Successful weight loss maintainers use health-tracking smartphone applications more than a nationally representative sample: comparison of the National Weight Control Registry to Pew Tracking for Health. *Obesity Science&Practice*, *3*(2), 117–126. http://doi.org/10.1002/osp4.102
Piwek, L., Ellis, D. A., Andrews, S.,&Joinson, A. (2016). The Rise of Consumer Health Wearables : Promises and Barriers. *PLoS Medicine*, *13*(2), e1001953. http://doi.org/10.1371/journal.pmed.1001953
Turner-McGrievy, et al. (2013). Comparison of traditional versus mobile app self-monitoring of physical activity and dietary intake among overweight adults participating in an mHealth weight loss program. *Journal of the American Medical Informatics Association : JAMIA*, *20*(3), 513–518. http://doi.org/10.1136/amiajnl-2012-001510

Self weighing

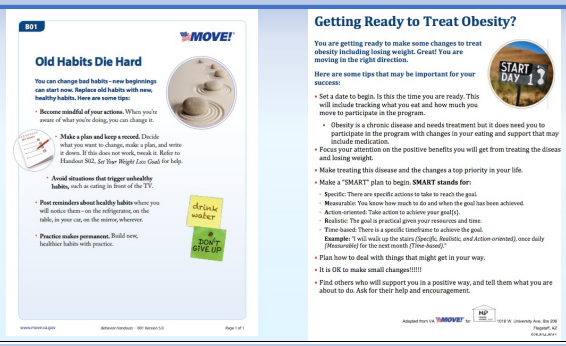
- Daily
  - Evidence: individuals who weighed every day achieved clinically meaningful weight loss that was significantly greater than among those weighing less than daily
  - Weight maintenance
  - Evidence: 75% weigh themselves at least once a week http://www.nwcr.ws/research/default.htm

Steinberg, D. M., Bennett, G. G., Askew, S.,&Tate, D. F. (2015). Weighing everyday matters: Daily weighing improves weight loss and adoption of weight control behaviors. *Journal of the Academy of Nutrition and Dietetics*, *115*(4), 511–518. http://doi.org/10.1016/j.jand.2014.12.011

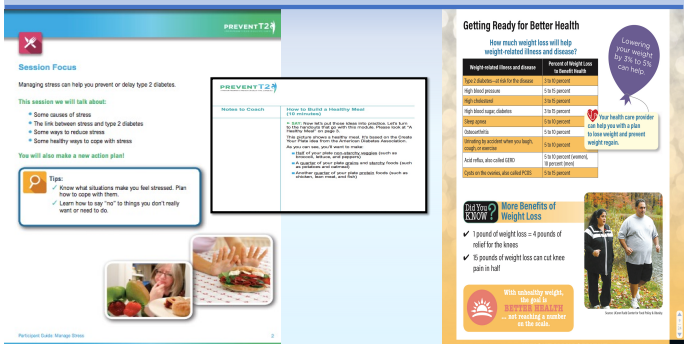
- Packaged programs for educational pieces

- VA MOVE example and adapted example
  - https://www.move.va.gov/docs/NewHandouts/BehavioralHealth/B01_OldHabitsDieHard.pdf
- DPP example
  - https://www.cdc.gov/diabetes/prevention/pdf/t2/Participant-Module-9_Manage_Stress.pdf
- AANP flipchart – iPad at https://www.aanp.org/practice/clinical-resources-for-nps/clinical-resources-by-therapeutic-area/obesity-and-weight-management

Behavioral Interventions



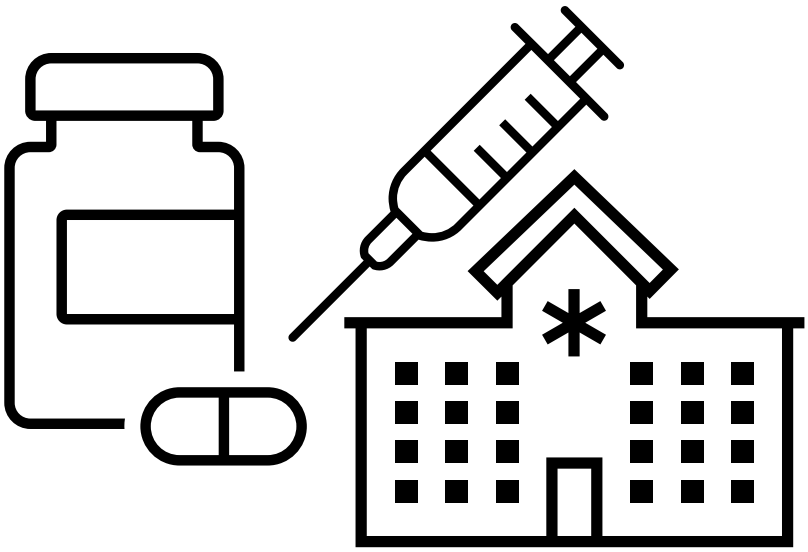
Behavioral Interventions



Practice Concepts

- Behavioral modification is a cornerstone of treatment that creates long term success
- Resources are readily available to use in your practice
- ILI on frequent basis are the most successful, they do not have to be hour long classes, 10 -15 minutes will create success

Part 3
Implement evidence-based guidelines to
direct the treatment for the management of obesity

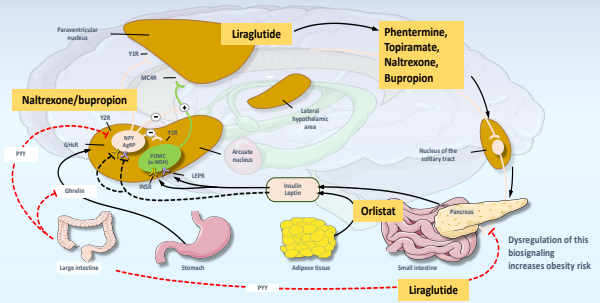


Why Use Medication With Obesity Treatment?

- Weight loss evokes a complex set of neuroendocrine physiologic adaptations that become more intense with greater weight loss
  - These work to slow, then eventually halt weight loss, and eventually may induce weight gain
- Patients who have lost weight find it very difficult to resist neuroendocrine physiology with diet and behavior modification alone
- Anti-obesity medications help offset the physiologic adaptations that resist weight loss and promote weight regain

Greenway FL. *Int J Obes (Lond).* 2015;39(8):1188–1196.

Impact on Hormonal Signaling of Medication



α-MSH, α-melanocyte-stimulating hormone; GHsR, growth hormone secretagogue receptor; INSR, insulin receptor; LEPR, leptin receptor; MC4, melanocortin-4 receptor; POMC, pro-opiomelanocortin; Y1R, NPY Y1 receptor; Y2R, NPY Y2 receptor.
Apovian CM, et al. *J Clin Endocrinol Metab.* 2015;100(2):342-362.

FDA-Approved Short-Term (Anti) Obesity Therapies

Generic Drug*	Dose	Contraindications	Side Effects
Phentermine	8mg-37.5mg	Anxiety disorder, CVD, hypertension, MAO inhibitors, glaucoma, hyperthyroidism, seizures, pregnancy/ breastfeeding, drug abuse history	Insomnia, palpitations, tachycardia, dry mouth, taste alterations, dizziness, tremors, headache, diarrhea, constipation, vomiting, gastrointestinal distress, anxiety, restlessness, increased blood pressure
Diethylpropion	25 mg or 75 mg, SR		
Phendimetrazine	17.5-70 mg or 105 mg, SR		
Benzphetamine	25-50 mg		

https://dailymed.nlm.nih.gov/dailymed/index.cfm; Bray GA, et al. *Circulation* 2012;125:1695-703
Apovian CM, et al. *J Clin Endocrinol Metab* 2015;100:342-62

*Mechanism of action = Sympathomimetic—noradrenergic causing appetite suppression

Phentermine

- US Drug Enforcement Agency scheduled IV drug
  - Risk for addiction
- Not indicated for long term use
  - 13 weeks by label

Endocrine Society allows for possible long-term use:

- No CVD
- No psychiatric/substance abuse history
- Has been informed about therapies that are approved for long-term use
- Document off-label use in patient's medical record
- No clinically significant increase in pulse/BP when taking phentermine
- Demonstrates significant weight loss with phentermine
- Start at 7.5 or 15 mg/d—dose escalate if not achieving significant weight loss
- Monitor monthly during dose escalation

Phentermine Study of Interest

- PC-II
  - 269 participants
  - 37.5 mg phentermine use longer than 2 years with abrupt withdrawal
  - Conclusions:
    - Phentermine abuse or psychological dependence (addiction) does not occur in patients treated with phentermine for obesity.
    - Amphetamine-like withdrawal does not occur upon abrupt treatment cessation even at doses much higher than commonly recommended and after treatment durations of up to 21 years

Hendricks EJ, Greenway FL. A study of abrupt phentermine cessation in patients in a weight management program. *Am J Ther*. 2011;18(4):292-299. doi:10.1097/MJT.0b013e3181d070d7

FDA-Approved (Anti) Obesity Therapies

Generic listed alphabetically	Mechanism of Action
liraglutide (subcutaneous injection)	GLP-1 receptor agonist
naltrexone/bupropion ER (oral)	Opioid receptor antagonist; dopamine and noradrenaline reuptake inhibitor
orlistat (oral)	Pancreatic lipase inhibitor—impairs gastrointestinal energy absorption, causing excretion of approximately 30% of ingested triglycerides in stool
phentermine/ topiramate-ER (oral)	Noradrenergic + GABA-receptor activator, kainite/AMPA glutamate receptor inhibitor causing appetite suppression
semaglutide (subcutaneous injection)	GLP-1 receptor agonist

https://dailymed.nlm.nih.gov/dailymed/index.cfm

Long-Term Efficacy for (Anti) Obesity Medications

Therapy (listed alphabetically)	Length of Trial	Mean Weight Loss
Liraglutide	≥1 year	-7.4% (full dose)
Naltrexone/bupropion	≥1 year	-5.4%
Orlistat	≥1 year	-6.1%
Phentermine/topiramate	≥1 year	- 9.8% (full dose)
Semaglutide	≥ 1 year	14.9% (full dose

Bray GA, et al. *Lancet* 2016;387(10031):1947-1956.
Kushner, R et al. (2020). *Obesity (Silver Spring, Md.)*, *28*(6), 1050–1061.

General Considerations in Pharmacologic Initiation

Pharmacologic interventions may be helpful as adjuvant therapy with lifestyle interventions for patients 18 years and older* with BMI ≥30 kg/m^2 or ≥27 kg/m^2 with comorbidities.

- Different patients respond to different medications
  - If one option does not work, consider others
- Discontinue medication in patients who do not respond with weight loss of at least 5% at 12 weeks after maximum dose**
- Avoid in pregnancy
  - Pregnancy tests at baseline
  - Consider a disclosure signature

* 12/2020 liraglutide label change for 12–17-year-old with body weight of 60kg an initial BMI corresponding to 30kg/m^2 or greater for adults
**by label Liraglutide requires only 4% weight loss at 12 weeks after maximum dose
**semaglutide does not have a % on the label

Orlistat

Dose Frequency	Efficacy	Contraindications/Precautions/ Warnings	Side Effects
60 mg OTC 120 mg TID within 1 h of fat-containing meal	• Mean weight loss ranged from 3.9%-10.2% at year 1 in 17 RCTs (120mg TID) • ↓ BP, TC, LDL-C, fasting glucose at 1 year • Slows risk of progression to T2DM	Chronic malabsorption syndrome, pregnancy, breastfeeding, cholestasis, some medications (ex. warfarin, antiepileptic agents, levothyroxine, cyclosporine)	Oily spotting, cramps, flatus with discharge, fecal urgency, fatty oily stool, increased defecation, fecal Incontinence

Practical Considerations
- Consider fat-soluble multivitamin
- Limit fat intake to 30% of calories
- Counsel on risk of GI adverse events

Lexicomp
Bragg R, et al. *J Am Assoc Nurse Pract* 2016;28:107-15; Kahan S. *Am J Manag Care.* 2016;22:S186-S196

Orlistat – Study of Interest

XENDOS
- Randomized study for prevention of DM2 in patients w obesity (2004)
- 4-year study of 3,305 patients with BMI ≥30 and normal or impaired glucose tolerance
- Conclusion: "Compared with lifestyle changes alone, orlistat plus lifestyle changes resulted in a greater reduction in the incidence of type 2 diabetes over 4 years and produced greater weight loss in a clinically representative obese population. Difference in diabetes incidence was detectable only in the IGT subgroup; weight loss was similar in subjects with IGT or NGT."
- DM 9% in placebo and 6.2% with orlistat – risk reduction of 37.3%

Torgerson, J. (2004) XENDOS study, Diabetes Care, 27(1), 155-161.

Phentermine/Topiramate ER

Dose Frequency	Efficacy	Contraindications/Precautions/ Warnings	Side Effects
• Initiate treatment at 3.75 mg/23 mg for 2 weeks • Increase to 7.5 mg/46 mg • Escalate to 11.25mg/69mg for 2 weeks then to max 15 mg/92 mg	• 10% weight loss with treatment vs 2% placebo • Improved cardiometabolic markers • Reduced progression to T2DM	Pregnancy and breastfeeding, hyperthyroidism, glaucoma, use of monoamine oxidase inhibitors	Paresthesias dizziness, taste alterations, insomnia, constipation, dry mouth, elevation in heart rate, memory or cognitive changes

Practical Considerations
- Titrate dose at initiation and discontinuation
- Drug Enforcement Agency Schedule IV drug
- Risk Evaluation and Mitigation Strategy
- Counsel about risk for mood disorders, suicidal thoughts
- Taper highest dose every other day for 1 week if discontinuation is necessary
- Women of childbearing age – pregnancy prevention plan and monthly pregnancy testing

Lexicomp
Bragg R, et al. *J Am Assoc Nurse Pract* 2016;28:107-15; Kahan S. *Am J Manag Care.* 2016;22:S186-S196

Phentermine/Topiramate ER Study of Interest

- Qsymia as an Adjunct to Surgical Therapy in the Superobese
  - Study done at Wake Forest University Health Sciences
  - ClinicalTrials.gov Identifier: NCT02301416
- This study tests the efficacy of the medication, Qsymia, as an adjunct therapy in superobese individuals planning to undergo weight loss surgery.
- There was a significant increase in the odds of achieving BMI less than 40 for the experimental group compared with controls at 6 months

source: https://clinicaltrials.gov/ct2/show/NCT02301416

Liraglutide

Dose Frequency	Efficacy	Contraindications/ Precautions/ Warnings	Side Effects
▪ Weekly titration by 0.6mg over 5 weeks to target dose of 3.0mg	▪ Mean weight loss 9% at 1 year ▪ Reduced progression to T2DM in patients with prediabetes ▪ Reduced risk of weight regain at 1 year	Medullary thyroid cancer history, multiple endocrine neoplasia type 2 history, history of pancreatitis, pregnancy, breastfeeding	Nausea, vomiting, diarrhea, constipation, hypoglycemia in patients with T2DM, increased lipase, increased heart rate, pancreatitis

Practical Considerations

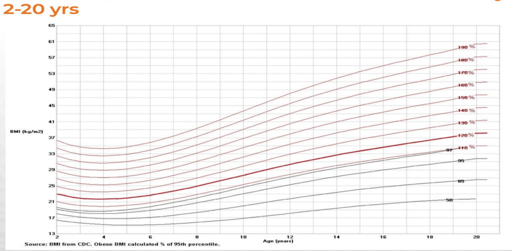
- Injectable administration
- FDA approved for use in adults with BMI ≥ 30kg/m² or BMI ≥ 27 kg/m² with at least one complication.
- Approved 12/2020 label change: treatment of obesity in adolescents aged 12 to 17 years with a body weight of at least 60 kg and an initial BMI corresponding to 30 kg/m² or greater for adults

Lexicomp
Bragg R, et al. *J Am Assoc Nurse Pract* 2016;28:107-15; Kahan S. *Am J Manag Care*. 2016;22:S186-S196

BMI Updated Graph

Assessment | Weight Assessment in Children with Obesity

Body Mass Index Charts for Children with Severe Obesity ages 2-20 yrs



Courtesy of OMA – Pediatric Algorithm 2020 - E-book Citation: Cuda S, Censani M, O'Hara V, Browne N, Paisley J. Pediatric Obesity Algorithm eBook, presented by the Obesity Medicine Association. www.obesitymedicine.org/childhood-obesity. 2020-2022. www.obesitymedicine.org/childhood-obesity (Accessed = 1/11/2021)

Liraglutide Study of Interest

- SCALE Obesity and Prediabetes trial (2017)
- 2,254patients
  - 80% less likely to develop diabetes than placebo group
  - 60% reverted to normoglycemia
  - of those that did go on to DM2 – took 2-7 times longer

leRoux, C., Astrup, A., Fujioka, K., Greenway, F., Lau, D., Gaal, L,. Ortiz, R., Wilding, J,. Skioth, T., Manning, L., & Pi-Sunyer, X. (2014). 3 years of liraglutide versus placebo for type 2 diabetes risk reduction and weight management in individuals with prediabetes: a randomised, double-blind trial, *The Lancet, 389*(10077), 1399-1409.

Naltrexone/Bupropion ER

Dose Frequency	Efficacy	Contraindications/ Precautions/ Warnings	Side Effects
▪ Initiate 8mg/90mg x 1 week ▪ Weekly escalation to target dose of 32mg/360 mg (2 tablets BID)	▪ Weight loss of 8.2% vs 1.4% (placebo) ▪ Improved cardiometabolic parameters ▪ Fewer cravings ▪ Lowered HbA1c in patients with T2DM	Uncontrolled hypertension, seizure disorder, anorexia or bulimia, drug or alcohol withdrawal, chronic opioid use, monamine oxidase inhibitors, caution with renal/hepatic impairment	Nausea, constipation, headache, dizziness, vomiting, insomnia, dry mouth Transient increase in blood pressure

Practical Considerations

- Titrate dose on initiation
- Monitor blood pressure
- Monitor closely for depression

Lexicomp

Naltrexone/Bupropion ER Studies of Interest

- CORI and II
  - COR II 1,496 participants
  - COR 1 1742 participants
    - Active treatment in the COR-I and COR-II trials was associated with significant improvements in eating control.
- LIGHT
  - Cardiovascular outcome study with 8900 participants
  - Crashed and burned
    - data was released through a patent and securities filing without knowledge from the study's clinical-trial leaders
    - interim analysis was agreed on by the FDA but was intended only to show the medication did not double the risk of cardiovascular events, due to the reports of increased blood pressure
    - DSMB performed an analysis of data that included 50% of the enrolled patients. When this analysis was performed, investigators found no reduction in cardiovascular events

Greenway, F. et al. (2010). Effect of naltrexone plus bupropion on weight loss in overweight and obese adults (COR-1): a multicenter, randomized, double-blind, placebo-controlled, phase 3 trial. Lancet, 376(741), 595-605.
Apovian, C. et al (COR-II Study Group (2013). A randomized, phase 3 trial of naltrexone SR/bupropion SR on weight and obesity-related risk factors (COR-II). Obesity (Silver Spring, Md.), 21(5), 935–943. doi:10.1002/oby.20309

Semaglutide

Dose Frequency	Efficacy	Contraindications/ Precautions/ Warnings	Side Effects
Weekly injections with titration every four weeks, 0.25 mg, 0.5 mg, 1 mg, 1.7 mg or 2.4 mg dose of 2.4 mg	Mean weight loss 14.9% at 68 weeks (STEP 1)	Medullary thyroid cancer history, multiple endocrine neoplasia type 2 history, suicidal behavior and ideation, pregnancy, breastfeeding, acute gallbladder disease, diabetic retinopathy, acute kidney injury	Nausea, vomiting, diarrhea, constipation, hypoglycemia in patients with T2DM, increased lipase, increased heart rate, pancreatitis

Practical Considerations

- Injectable administration
- FDA approved for use in adults with BMI ≥30kg/m² or ≥27 kg/m² with at least one obesity related comorbid condition
- Approved 6/2021
- Clinician determined end point
- Nausea most common issue – slow titration

https://www.novo-pi.com/wegovy.pdf

Semaglutide Study of Interest

STEP 1 (Semaglutide Treatment Effect in People with obesity)

- 86.4% lost at least 5% of their baseline bodyweight
- 69.1% lost at least 10% of their baseline bodyweight
- 50.5% lost at least 15% of their baseline bodyweight
- 32.0% lost at least 20% of their baseline

Kushner, R. F., Calanna, S., Davies, M., Dicker, D., Garvey, W. T., Goldman, B., Lingvay, I., Thomsen, M., Wadden, T. A., Wharton, S., Wilding, J., & Rubino, D. (2020). Semaglutide 2.4 mg for the Treatment of Obesity: Key Elements of the STEP Trials 1 to 5. Obesity (Silver Spring, Md.), 28(9), 1663–1671. https://doi.org/10.1002/oby.22794

Rare Genetic Cause of Obesity Treatment

Uncommon Obesity

>20 rare genetic disorders

Common symptoms

- Early onset of severe obesity, often less than one year of age
- Insatiable hunger (hyperphagia)

Genetic testing is critical (free)

Patient eligibility criteria:

- ≤18 years of age, BMI ≥97th percentile or
- ≥19 years of age, BMI ≥40 kg/m², and a history of childhood obesity before age 10

Uncommon Obesity. https://www.uncommonobesity.com/. Accessed February 23, 2021. Rhythm Pharmaceuticals. https://www.rhythmtx.com/science-overview/. Accessed February 23, 2021.

Setmelanotide – Imcivree™

- Approved in November 2020 for patients with obesity due to POMC, PCSK1, or LEPR deficiency
  - Impaired MC4 receptor pathway
  - Adults and pediatric patients 6 years of age and older with deficiency confirmed by genetic testing
- Action: MC4 receptor agonist
  - Restore impaired MC4 receptor pathway activity arising due to genetic deficits upstream of the MC4 receptor
- Rare pediatric disease priority review voucher, breakthrough therapy designation, orphan drug designation

PCSK1, proprotein convertase subtilisin/kexin type 1.
Uncommon Obesity. https://www.uncommonobesity.com/. Accessed February 23, 2021. Rhythm Pharmaceuticals. https://www.rhythmtx.com/science-overview/. Accessed February 23, 2021.

Setmelanotide - Study of Interest

- Setmelanotide for the Treatment of LEPR Deficiency Obesity
  - 11 participants
  - Open label one year trial in patients with early onset Leptin Receptor (LEPR) deficiency obesity due to Bi-Allelic loss-of-function LEPR genetic mutation
  - Results
    - 45% (5) had at least 10% weight loss

https://clinicaltrials.gov/ct2/show/NCT03287960 and https://www.thelancet.com/journals/landia/article/PIIS2213-8587(20)30364-8/fulltext

Gelesis 100/Plenity

- Hydrogel matrix – cellulose and citric acid
- Mechanism of Action: capsule releases non-aggregating particles that absorb water
  - Increase the volume and elasticity of stomach and small intestines
- Dosing: three capsules taken before lunch and dinner with 16-20 ounces of water
- Indication: BMI >25 kg/m^2 < 40kg/m^2
- Side Effects: GI: diarrhea, abdominal distension, constipation, nausea, abdominal pain
- Caution: patients with severe reflux or ulcers
- NO RESTRICTION on how long it can be used

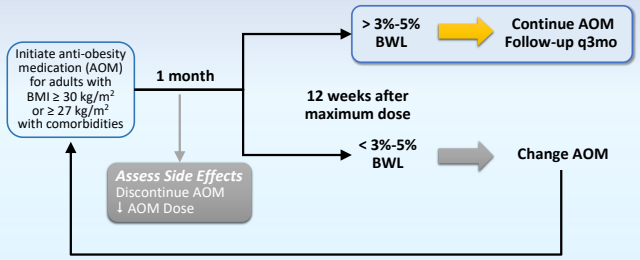
https://www.myplenity.com/static/pdfs/hcp-isi.pdf

Gelesis - Study of Interest

- Gelesis Loss of Weight (GLOW) study
- 52 patients
  - with or without diabetes
  - 300kcal/d calorie deficit
  - 30 minutes of walking/day
  - Aged 22 to 65
- Amount of loss: 59% lost at least 5%, 27% lost at least 10%
-

Greenway, et al. (2018). A Randomized, Double-Blind, Placebo-Controlled Study of Gelesis100: A Novel Nonsystemic Oral Hydrogel for Weight Loss. https://www.ncbi.nlm.nih.gov/pubmed/30421844

Initial Management with Anti-Obesity Medications: Continue only in Responders



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Bray GA, et al. *Lancet*. 2016;387:1947-56. Apovian CM, et al. *J Clin Endocrinol Metab*. 2015;100:342-362.

Obesogenic Medications

Evaluate for Obesogenic Medications

Diabetes		
Weight positive	**Weight neutral**	**Weight negative**
Insulin	DPP-IV	Metformin
Sulfonylurea		Pramlintide
Pioglitazone		GLP1
Rosiglitazone		SGLT2i
Hypertension		
Weight positive	**Weight neutral**	**Weight negative**
Beta blocker	ACEi, ARBs	
	Alpha blockers	
	CCBs	

Antidepressants		
Weight positive	**Weight neutral**	**Weight negative**
Mirtazapine	Fluoxetine	Bupropion
Citalopram	Escitalopram	
Paroxetine	Sertraline	
Amitriptyline	Vortioxetine	
Rheumatic Disease		
Weight positive	**Weight neutral**	**Weight negative**
Corticosteroids		

ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; CCB, calcium channel blocker; DPP, dipeptidyl peptidase.
Wharton S, et al. *Diabetes Metab Syndr Obes*. 2018;11:427-438.

Future of AOMs

Medication name or class	
tirzepatide	GIP/GLP-1 agonist, phase 3 trial, improved beta cell function and insulin sensitivity and 11% weight loss.
GLP-1/ glucagon receptor agonists	phase 2 trials with 5kg weight loss and improved HgbA1C
empatic (zonisamide/bupropion)	dopamine and norepinephrine -reuptake inhibitor, phase IIb trial, average 14% weight loss at 48 weeks
tesofensine	presynaptic inhibitor of norepinephrine, dopamine, and serotonin: induces weight loss by promoting the satiety feeling and slightly increasing metabolic rate

Future of AOMs

Medication name or class	
Amylin/leptin	pramlintide/metreleptin (showed promise but stopped in 2011)
cannabinoid-1 receptor (CB1) antagonists	stimulates anorexigenic signaling
SGLT2-I with phentermine	clinical trial completed 2016, demonstrated > 5% weight loss with reductions in systolic BP
GLP1 with…..	SGLT2I or PYY3-36 or CCK or setmelanotide all being investigated in early trials
glucogon-GIP-GLP1 agonist	tri-agonist
ghrelin antagonist or vaccine	inhibition of ghrelin receptor

Polling question

- Which (if any) of this list of medications is potentially obesogenic?
  a. Metoprolol
  b. Omeprazole
  c. Vortioxetine

Practice Concepts

- Intensify treatment with pharmacology
- Evaluate medication success at “12 weeks”
- If one medication doesn’t work, try another

d. More than 1 medication is obesogenic
e. None are obesogenic

- Obesity is a chronic disease so expect to treat it long term (possibly with medication support for life – just like HTN and diabetes

Bariatric Surgery

BMI ≥40 kg/m² if surgical risk is acceptable

BMI ≥35 kg/m² if >1 obesity-related disease

BMI 30-34.9 kg/m² for T2DM and/or metabolic syndrome

Inability to achieve + sustain healthy weight loss with prior weight loss efforts

Photo courtesy of Obesity Action Coalition

Apovian CM, et al. *J Clin Endocrinol Metab* 2015;100:342-62 Rubino F, et al. *Diab Care* 2016;39:861-877 Aminiam, A. et al. (2018) ASMBS updated position statement on bariatric surgery in class I obesity. *Surgery for Obesity and related Diseases, 14, 1071-1087*

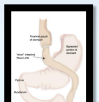
Bariatric Surgical Procedures*

(*ASMBS approved)

Sleeve Gastrectomy VSG/LSG (53%)
25-30% Total Weight Loss

Adjustable Gastric Band AGB/LAGB (10%)
15-25% Total Weight Loss

Gastric Bypass RYGB/LRYGB (37%)
35-40% Total Weight Loss



Duodenal Switch DS/LDS (3-4%)
>40% Total Weight Loss

Neff KJH, LeRoux C. J Clin Pathol 2013;66:90-8.

Beyond Restriction or Malabsorption

- Surgeries appear to lower the defended level of body-fat mass, presumably through effects involving the gut–brain axis
- Appetite decreased
  - Alteration of communication of the "gut–brain axis"
  - Signals:
    - gastric hormones, ex. ghrelin
    - intestinal hormones, ex GLP-1, peptide tyrosine tyrosine
    - alterations in the level and composition of bile acids and/or the intestinal microbiome

Michael W Schwartz, Randy J Seeley, Lori M Zeltser, Adam Drewnowski, Eric Ravussin, Leanne M Redman, Rudolph L Leibel, Obesity Pathogenesis: An Endocrine Society Scientific Statement, *Endocrine Reviews*, Volume 38, Issue 4, 1 August 2017, Pages 267–296, https://doi.org/10.1210/er.2017-00111

Benefits of Surgery

- Resolution or improvement of many ORCs
  - Examples
    - T2DM
    - Sleep apnea
    - HTN
    - PCOS
    - GERD
    - NALFD

Contraindications to Bariatric Surgery

- Active Substance abuse
- Active psychiatric disease
- Active binging/bulimia
- Noncompliance
- Poor competence

***Not a contraindication:**
- **HgbA1c > 8%**
- **Age**
- **New Cancer diagnosis**

American Society for Metabolic and Bariatric Surgery (2016). Who is a Candidate for Bariatric Surgery. https://asmbs.org/patients/who-is-a-candidate-for-bariatric-surgery
Johnson RJ, Johnson BL, Blackhurst DW, Bour ES, Cobb WS 4th, Carbonell AM 2nd, Lokey JS, Scott JD. Am Surg. 2012 Jun;78(6):685-92.

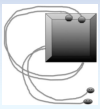
Follow-up post surgery

- Nutrient assessment 3-6 months the first year, then annually
  - What nutrients to screen for?
    - Thiamine
    - Vitamins B12, D, A, E, K
    - Folate
    - Iron
    - Calcium
    - Zinc
    - Copper (GBP & DS)
- One year post op, then every two years – Bone Density

Vitamin supplementation lifelong post surgery

Devices

- Is there a role for temporary devices to treat obesity if it is a long term chronic disease?
- Safety is high, efficacy better than behavior modification but less than more traditional surgery
- Removable and repeatable
- Affordable?
- Like other surgical treatments, they can be divided into physiologic vs. mechanical effects
  Physiologic – neural Blocking device
  Mechanical – space occupying or narrowing of stomach



Practice Concepts

- All patients that meet criteria should discuss intensifying therapy for surgery
- Primary care is often responsible for long term follow-up post bariatric surgery

Case Study - Meet Ellen

38-year-old woman presents today to discuss possible assistance with her increasing weight.

PMH**:**

Class 2, AACE Stage 2 obesity
Gastroesophageal reflux disease (GERD) – *omeprazole OTC once daily*
Hypertension – *metoprolol 20 mg/day*
LBP – occasionally takes hydrocodone
Metabolic Associated Fatty Liver Disease (MAFLD)
Migraines – 3-4 x month, uses OTC acetaminophen, aspirin, caffeine combination and rest
Insulin resistance – *metformin 2000 mg/day*

SH: Tubal Ligation

Family History:

HTN, DM (father, mother, sister) and all are “heavy”; no history of thyroid cancer

Social History:

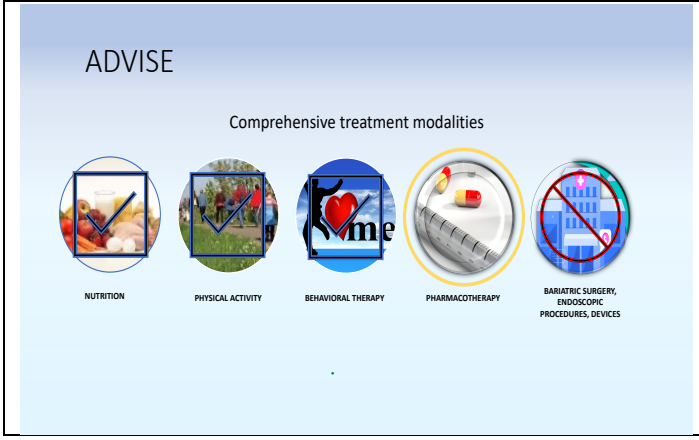
Married with two teenagers at home
Works outside the house as a nurse
ETOH 1x/week
No history of tobacco use or drug abuse
Has no AOM coverage on insurance

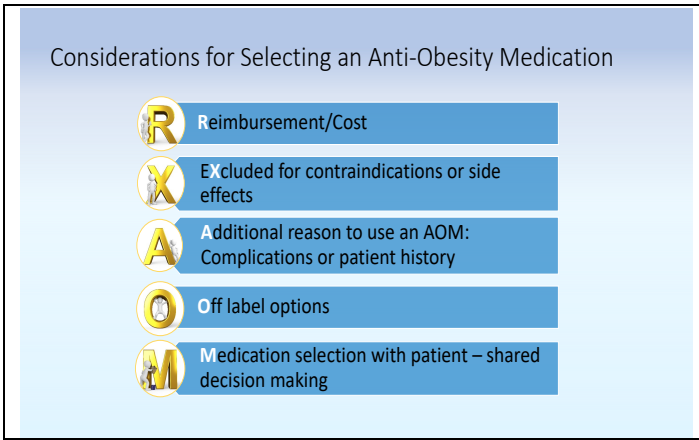
Eating/weight history
Feels hungry all the time
Wants to impact other diseases and feel better
Used orlistat OTC with SE

ASSESS: Physical Exam, Labs

Height	Weight	BMI	BP
5'6"	216 lbs	34.50 kg/m^2	132/84

Pertinent Physical Exam Findings
- Neck circumference: 15 inches
- Waist circumference: 42 inches
- Screening tools: PHQ9 (4), BED7 (negative), STOP-BANG (2)

Polling question You are considering whether to start Ellen on pharmacotherapy. What are the criteria for starting pharmacotherapy?	a. Initiate AOMs only for adults with BMI ≥30 kg/m^2 b. Initiate AOMs for adults with BMI ≥30 kg/m^2 or ≥27 kg/m^2 with comorbidities c. Initiate AOMs for adults with BMI ≥35 kg/m^2 or ≥30 kg/m^2 with comorbiditie d. Initiate AOMs for adults with BMI ≥25 kg/m^2 who are unable to lose weight with lifestyle changes
	

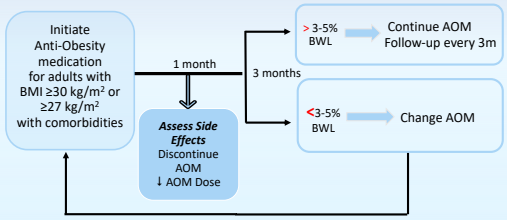


Using RXAOM for shared decision making

	R	X	A	O	M
Liraglutide					
naltrexone bupropion					
orlistat					
phentermine					
phentermine topiramate					
Semaglutide					

Initial Management with Anti-Obesity Medications

Continue Only in Responders



Ellen: Measuring Efficacy

Begin therapy with phentermine/topiramate	Initiate 3.75mg IR/23mgER mg tablet once/day, increasing to 7.5mgIR/46mgER once a day (can increase more if not losing weight
Effective response to therapy	>5% weight loss from baseline 12 weeks
Improvement in CV risk markers	Improvement in BP and insulin resistance

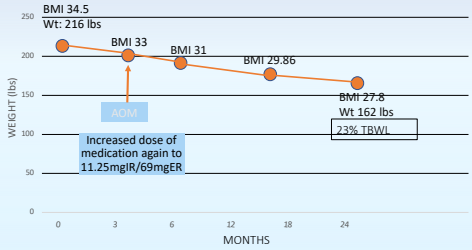
Continue to See Patient Every 2-4 Weeks

- ✓ **Intensive Lifestyle Intervention**
  - Can be done by other providers as well, e.g., dietitians, physical therapy/exercise physiologist, health coaches
- ✓ **Monitoring: BP, weight**

Image: © Obesity Action Coalition

Ellen's Weight History

Medical Management



Improvement in Medical Conditions

- Obesity Class II → Improved, now with pre-obesity
- Insulin resistance → Resolved, off metformin
- GERD → Resolved
- HTN → Resolved (BP 116/72), Off Medication
- LBP → Resolved
- Metabolic Associated Fatty Liver Disease (MAFLD) → Resolved
- Migraines → Improved, 1 headache a month
- Depression → Improved (PHQ9-0), remains on vortioxetine

Part 4
Understand basic coding for obesity management

Routine Billing

- E&M coding of office visits
  - New Patients 99201-205
  - Existing Patients 99211-215
  - Nothing different than usual
    - History
    - PE
    - Medical Decision Making

https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNEdWebGuide/Downloads/97Docguidelines.pdf

MDM in 2021

- Medical Decision Making
  - Number and complexity of problems addressed
    - Higher the applicable level of decision-making
    - Ranges from straightforward to low, moderate, and high.
  - Amount and/or complexity of data reviewed and analyzed
  - Risk of complications and/or morbidity or mortality

MDM in 2021

- Medical Decision Making
  - Ranges from straightforward to low, moderate, and high.
    - Low
      - Chronic Stable Illness
    - Moderate
      - Chronic illness that is worsening, poorly controlled, uncontrolled or progressing (requiring additional supportive care or attention to side effects but does not need hospitalization)
      - Undiagnosed with high risk of morbidity without medical intervention
    - High
      - Chronic with severe exacerbation, progression or side effects of treatment

Medical Decision Making – adapted from AMA Coding

Code	Level of MDM needs 2 out of 3 elements of MDM	Number and complexity of problems addressed	Amount &/Or complexity of Data reviewed or analyzed	Risk of complication &/or morbidity or mortality
99202 99212	Straightforward	Minimal – a self limited or minor problem	Minimal or no data reviewed	
99203 99213	Low	2 or more self-limited or minor problems 1 stable chronic illness 1 acute, uncomplicated illness or injury	Need at least 1 of the two categories Category 1: Any combination of 2 of the following: • Review of prior external note (can do two from unique sources0 • Review of results of unique test OR • Ordering of unique test Category 2: Assessment requiring independent historian	Low risk of morbidity from additional diagnostic testing or treatment
99204 99214	moderate	1 or more chronic illnesses with exacerbation, progression or side effects of treatment OR 2 or more stable chronic illnesses OR 1 undiagnosed new problem with uncertain prognosis OR 1 acute illness with systemic symptoms OR 1 acute complicated injury	Need at least 1 of the 3 categories Category 1: Any combination of 3 of the following • Review of prior external notes from unique sources • Review of results of unique test • Ordering of unique test OR • Assessment requiring an independent historian Category 2: Independent interpretation of tests performed by another health care professional (not separated reported) Category 3: Discussion of management or test interpretation with external health care professional/appropriate source	Moderate risk of morbidity from additional diagnostic testing or treatment Ex prescription drug management, decision regarding minor surgery with patient or procedure risk factors, decision regarding elective major surgery without risk factors, diagnosis or treatment limited by social determinants of health
99205 99215	High	1 or more chronic illnesses with severe exacerbation, progression, or side effects of treatment OR 1 acute or chronic illness or injury that poses a threat to life or bodily function	Need at least 2 of the 3 categories Category 1: Any combination of 3 from the following: • Review of prior external note(s) from each unique source • Review of the result(s) of each unique test • Ordering of each unique test OR • Assessment requiring an independent historian Category 2: Independent interpretation of tests performed by another health care professional (not separated reported) Category 3: Discussion of management or test interpretation with external health care professional/appropriate source	High risk of morbidity from additional diagnostic testing or treatment *Examples only:* Drug therapy requiring intensive monitoring for toxicity, decision regarding elective major surgery with identified patient or procedure risk factors, decision regarding emergency major surgery, decision regarding hospitalization, decision not to resuscitate or to de-escalate care because of poor prognosis.

Time in 2021

- May include all related activities **on the day of encounter**
  - Examples – not all inclusive
    - Preparing to see the patient (eg, review of tests)
    - Obtaining and/or reviewing separately obtained history
    - Performing a medically appropriate examination and/or evaluation
    - Counseling and educating the patient/family/caregiver
    - Ordering medications, tests, or procedures
    - Referring and communicating with other health care professionals (when not separately reported)
    - Documenting clinical information in the electronic or other health record

Time in 2021

New Patient	Total Time	Established Patient	Total Time
99201	deleted	99211	
99202	15 - 29 minutes	99212	10 - 19 minutes
99203	30 - 44 minutes	99213	20 - 29 minutes
99204	45 - 59 minutes	99214	30 - 39 minutes
99205	60 - 74 minutes	99215	40 - 54 minutes

For prolonged services use 99417 for 15 minutes (>75 minutes new patient, >55 minutes established patient)

Documentation of Time

- Best practice – start and stop for each component
- 99215
  - 9:05-9:10 reviewed labs and patient food logs prior to visit
  - 9:10-9:40 patient in room for visit and education
  - 9:40-9:50 completed clinical information, ordered lab tests and medication refill
  - 45 minutes total spent

Codes

Obesity Codes

Code	Explanation
E66.0	Obesity due to excess calories*
E66.01	Morbid or severe obesity due to excess calories*
E66.1	Drug-induced obesity
E66.2	Morbid or severe obesity with alveolar hypoventilation
E66.3	Overweight
E66.8	**Obesity, other**
E66.9	Obesity, unspecified

Code (ex)	BMI
Z68.30	30.0-30.9kg/m^2
Z68.34	34.0-34.9kg/m^2
Z68.38	38.0-38.9kg/m^2
Z68.43	50.0-59.9kg/m^2 (changes after BMI 40)

PEARL – with so many complications and comorbidities I rarely use the BMI except if using counseling codes with E&M

Other Codes

Screening	
Z13.1	Encounter for screening for diabetes mellitus
Z13.2	Encounter for metabolic & other endocrine disorders
Z13.21	Encounter for screening for nutritional disorder
Z13.29	Encounter for screening for other suspected endocrine disorder(includes screening for thyroid disorder)
Z13.228	Encounter for screening for lipoid disorders

Counseling	
Z71.89	Other specified counseling - Exercise counseling
Z71.3	Dietary counseling and surveillance

Example charting

- **Assessment:**
  - Obesity E66.8 A/E BMI of 38.4 and waist circumference 51" Stage 2 based on BMI and obesity related complications
  - E11.65 Diabetes A/E by HgbA1c 6.8 – treating with management of obesity and metformin and SGLT2
  - I10.0 Hypertension, controlled A/E by BP today of 128/86 – treating with management of obesity and medications (ACE-I)
  - F33.0 Depression – in remission A/E by PHQ9 of 4, continuing the antidepressant vortioxetine
  - E78.1 Hypertriglyceridemia (new onset) – A/E by triglyceride of 230. Treating with management of obesity – will monitor with repeat level in 6 months.

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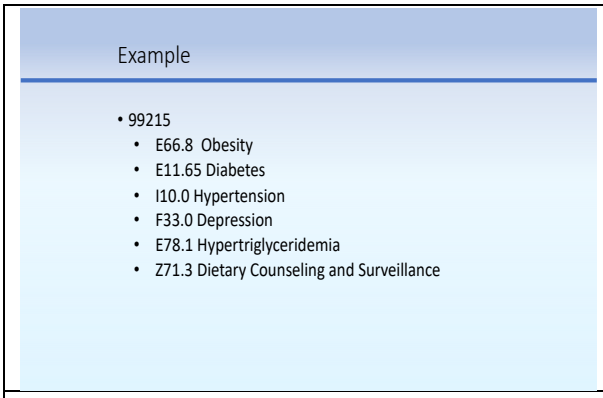
<tr><td> 
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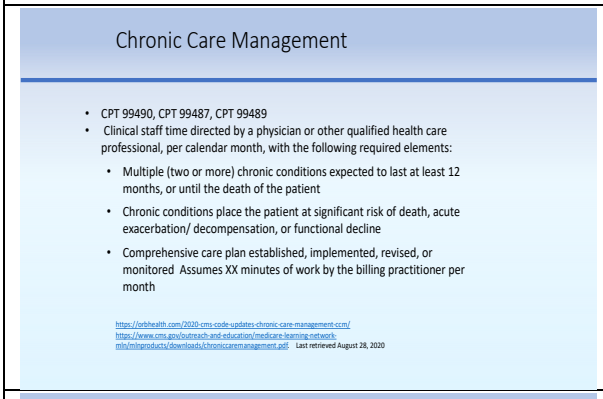
<tr><td> 
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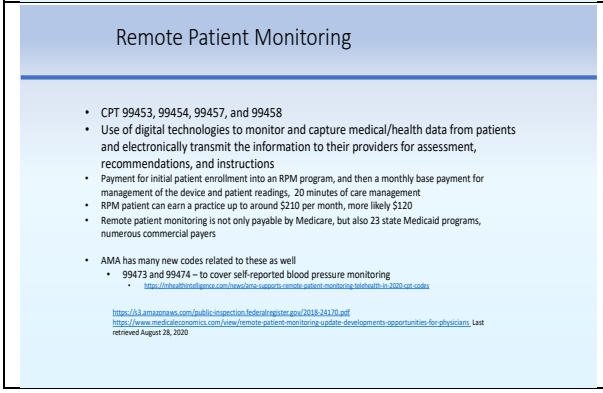
<tr><td> 
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Medicare only

- Does not cover obesity for medical management as primary insurance (maybe
- Does cover surgical management
- With Medicare Advantage SOME pay medical management

Definition of IBT For Obesity

- Screening for obesity in adults using measurement of BMI
- Dietary (nutritional) assessment
- Intensive behavioral counseling and behavioral therapy to promote sustained weight loss through high intensity interventions on diet and exercise

- *Department of Health and Human Services Centers for Medicare and Medicaid. IBT for obesity. ICN 907800. January 2014.*

Office Visit Frequency Reimbursement Schedule Established by Medicare

- One face-to-face visit every week for the first month;
- One face-to-face visit every other week for months 2-6;
- One face-to-face visit every month for months 7-12, if the beneficiary meets the 3kg weight loss requirement during the first 6 months
  - Total of 22 visits
  - Repeat of benefits annually
- Limited to outpatient and specific providers – primary care providers.

Documentation Required for IBT

- Document BMI and weight changes over multiple visits (at beginning at at 6 months as a minimum)
- Code **G0447** is for face-to-face behavioral counseling for obesity (15 minutes) - individual
  - Document BMI Z68.XX
  - Document Z counseling code(s) Z71.X
- Can be done in groups up to 10 people
  - Code is G0473 and is for 30 minutes
  - For much more information: Electronic Code of Federal Regulations. Title 42: Public Health. Part 410:Supplementary Medical Insurance Benefits; Subpart B: Medical and Other Health Services.
    - https://www.ecfr.gov/cgi-bin/text-idx?SID=21d56c5acb0a61e6455127609a642c2a&mc=true&node=se42.2.410_126&rgn=div8

Documentation and billing example Medicare

- Documentation example in the follow-up visit plan of care:
  - Chief Complaint: Here for IBT based on initial BMI of 33kg/m^2
  - Subjective:
    - Patient states he tracked food for past week and has been walking for 5 minutes each day. Was able to increase vegetable servings to two times a day without any problems
- Assessment: BMI 33
- Plan: 15 minutes face-to-face spent with patient for IBT. Reviewed patient's food tracking and activity for the past week; found patient increasing intake of processed foods on Wednesday and Sunday with new job at church. Advised patient on healthier choices. Patient agreed to try new options at church social events. Patient will increase walks to 10 minutes 3 days a week and continue at 5 minutes the other days. Next IBT appointment in one week. 15 minutes spent with patient

  - G0447
  - Z68.33
  - Z13.89
  - Z71.3

Case Study

You reviewed an established patient's labs (5 minutes) prior to the patients visit.

Patient was in the room (15 minutes), addressed obesity (BMI 33), diabetes (controlled no changes in therapy), and depression (PHQ9 14) at this visit

Phone call with patient's psychiatric provider later that afternoon (20 minutes)

Ordered two new medications with one requiring a prior authorization (15 minutes).

Called the patient to discuss the updates in medication management (10 minutes). Documentation that evening (20 minutes).

E66.8 Obesity
E11.65 Diabetes
I10.0 Hypertension
F33.0 Depression
E78.1 Hypertriglyceridemia

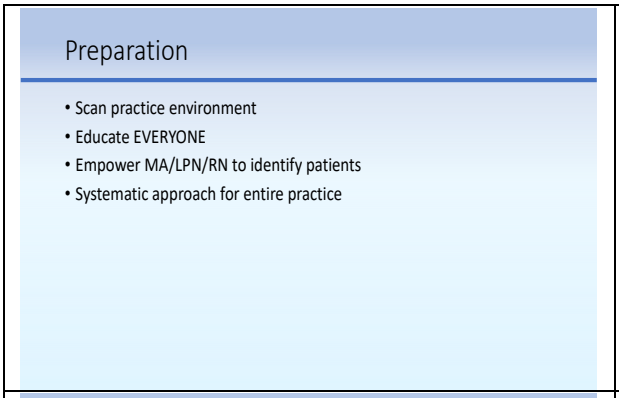
What E & M code(s) did you use for this visit?

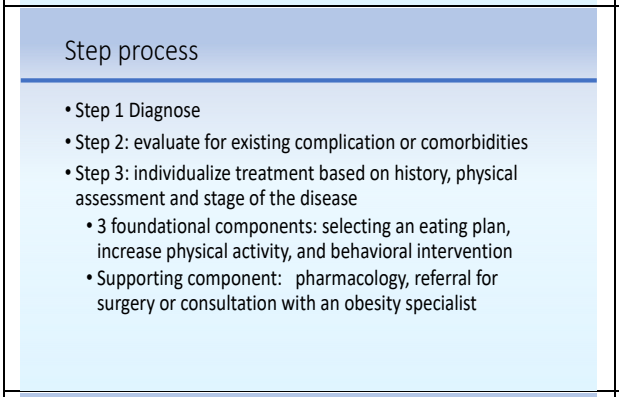
Polling question • Which of the following codes did you use for your case study a) 99214 based on MDM b) 99215 based on MDM c) 99215 based on time d) 99215, 99417 x 2 based on time	

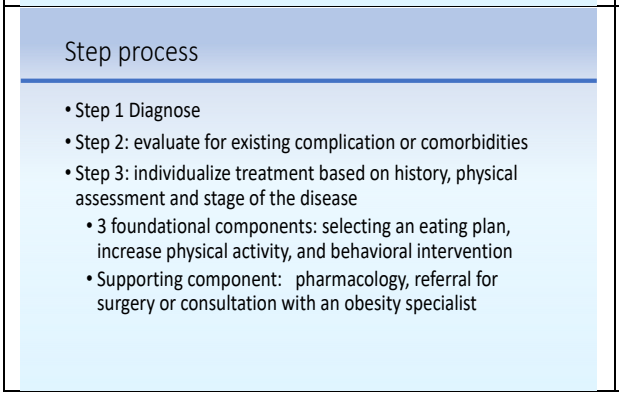
Practice Concepts	**Polling question**
• Insurances do pay for the treatment of obesity, not all yet but the majority • Coding doesn't have to be complicated and using known E&M coding is perfectly fine • Work with your billers and coders to determine if preventative codes are available	• Which of the following codes could imply bias around obesity a) E66.2 Severe obesity with alveolar hypoventilation b) E66.0 obesity due to excess calories c) E66.2 Drug-induced obesity d) E66.8 Obesity, unspecified

Part 5

Utilize case studies to apply the learned knowledge related to evidence based treatment for chronic disease of obesity







Visit 0 – Meet John

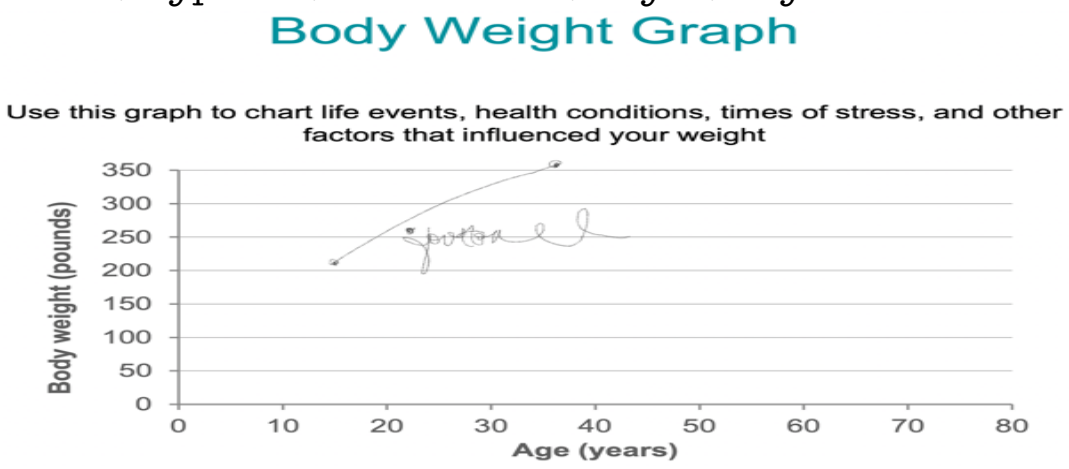
- John arrives at the office for a commercial drivers license (CDL) visit.
- He is sitting in a wide comfortable chair in the waiting room and has this month's Weight Matters from the Obesity Action Coalition among other health and outdoor magazines to choose from.
- MA notes a BMI of 43 from a previous visit.
- She gets a measured height on the patient and the weight and VS.

Height	Weight	BMI	BP
6'2"	352 lbs	45.19 kg/m^2	138/86

- Then in the room explains to the patient that a new "vital sign" has been added to well visits and she will be doing a waist circumference. Today's BMI is 45 with a waist circumference of 56".
- After the CDL visit John is given a brochure on obesity and treatment and recommendation to make an appointment for follow-up.
- John made a FU appointment with you for obesity.

Visit One

- Weight History
  - Has tried multiple times to lose weight, started gaining after college and although occasionally loses 20 pounds it never stays off.
  - Has not tried any anti obesity medications but has tried says he has tried every OTC found at the local health food store.
  - current eating habits; as a truck driver eats at truck stops for most meals 5 days a week but is very interested in making a change if it will help his health
  - current physical activity – nothing specific – "walk a lot at work unloading the truck and moving items"
  - He would like to stop medications, wants to be able to walk easier and feel better, and he doesn't want to progress to insulin as he would lose his job
- Current diagnosis and medications
  - sleep apnea: reports daily use of her BiPAP
  - GERD: omeprazole daily
  - knee pain and back pain: takes ibuprofen and acetaminophen
  - depression and anxiety: escitalopram
  - Prediabetes: metformin
  - HTN: losartan
- PMH: Denies history of stroke, cardiovascular disease, arteriosclerosis, valvular heart disease, glaucoma, hyperthyroidism, seizures, renal disease, pulmonary hypertension, or pancreatitis.
- Social History:
  - Lives with wife and two daughters
  - drinks socially maybe one beer per week and denies any illicit drug use
  - no history of use of tobacco
  - Patient has AOM coverage for his insurance
- Family History: Both parents alive. "everyone in my family is heavy" and his mother and older sister both have diabetes that came in adult years. His father has hypertension. He denies any history of cancer in the family.



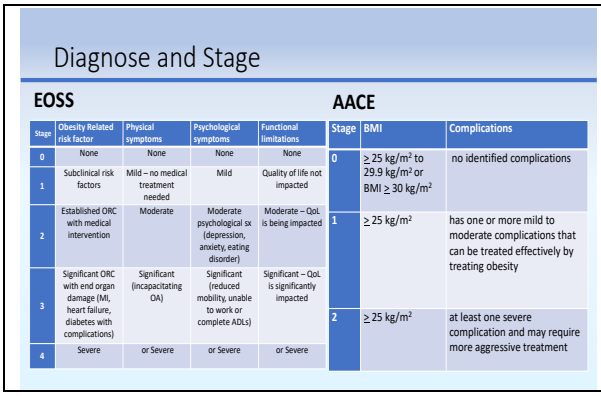
- VS: BP 132/82 HR 78 RR 16 pOx 98% 6'2" 351# BMI 45 kg/m^2.
- Objective
  - General: patient in NAD, cooperative with examiner, well groomed, alert and oriented x 4.
    Eyes: PERRL, Eyes: conjunctivae clear, no discharge. Ears: Canals clear bilaterally, TM's normal bilaterally. Nose: Moist, pink mucosa without lesions or mass. Throat: no exudates, no erythema.
    Neck: Supple, no masses, no thyromegaly, no bruits, no lymphadenopathy
    Chest: BSCTA = bil, no rales, no rhonchi, no wheezes, speaking in full sentences, respirations non labored
    Heart/CV: RR, no rubs, no gallops; Radial and pedal pulses 2+ = bil
    Abdomen: bowel sounds normal, percussion tones nl, SNT without rebound, no masses, no splenomegaly.
    Neuro: A&O x 4, CN II-XII grossly intact, stable gait, romberg negative, DTR's 2+ and = bilaterally, recent and distant memory grossly intact.
    Extremities: Warm, well perfused, no edema, grips and pushes 2+ = bilaterally.
    Screenings completed: BED- 7 SCORE: negative. STOPBANG: Not done as patient has diagnosis of Sleep Apnea PHQ9 Score of 4 PARQ negative
  - Recent labs show CMP, CBC, TSH, FT4, FT3 are within normal range. Total cholesterol is 188, LDL is 98, triglycerides 250, HDL 33 and hemoglobin A-1 C is 6.1.

Screening tools

PHQ9	evaluate for depression since many AOMs can have an impact and is a comorbidity – presence of either worsens the other
BED-7	evaluations for binge eating, 30% of patients with obesity have BED as well and will require treatment for this psychiatric disorder with obesity treatment. At this time assess for eating disorders screening for purging behaviors
STOP BANG	screening for sleep apnea a comorbidity with obesity, they each worsen the other
PARQ	Screening for inappropriate physical activity without further evaluation
Recent labs	CBC, CMET, TSH with FT4 and FT3, Vitamin D, lipid panel, fasting insulin (or cpeptide) and fasting glucose. Fasting insulin or cpeptide with the fasting glucose will be placed into the HOMA-IR2 calculator to evaluate for insulin resistance IF the patient does not have established prediabetes or diabetes

Visit One

Physical exam specific to obesity	Finding	Indicates possibility of:
Skin	Rashes in skin folds	Possible fungal infections
	Hirsutism in women	Excess testosterone or possible PCOS
	Acanthosis nigricans	Insulin resistance
CV	Irregular heart rate	Possible arrhythmias like afib
	PMI shifted	Cardiomegaly
	Peripheral edema or varicosities	
Respiratory	Decreased diaphragmatic excursion	Respiratory insufficiency
Abdomen	Enlarged liver measurement	NAFLD possibility
	Striae	Excess cortisol
Extremities	Peripheral edema or varicosities	CHF, PVD
	Joint deformities	Pressure alterations, arthritis
General	Lipodystrophic fat distribution	Insulin resistant



Stage	Obesity Related risk factor	Physical symptoms	Psychological symptoms	Functional limitations
0	None	None	None	None
1	Subclinical risk factors	Mild – no medical treatment needed	Mild	Quality of life not impacted
2	Established ORC with medical intervention	Moderate	Moderate psychological sx (depression, anxiety, eating disorder)	Moderate – QoL is being impacted
3	Significant ORC with end organ damage (MI, heart failure, diabetes with complications)	Significant (incapacitating OA)	Significant (reduced mobility, unable to work or complete ADLs)	Significant – QoL is significantly impacted
4	Severe	or Severe	or Severe	or Severe

Stage	BMI	Complications
0	$\geq$ 25 kg/m^2 to 29.9 kg/m^2 or BMI $\geq$ 30 kg/m^2	no identified complications
1	$\geq$ 25 kg/m^2	has one or more mild to moderate complications that can be treated effectively by treating obesity
2	$\geq$ 25 kg/m^2	at least one severe complication and may require more aggressive treatment

- Plan
  - Make any referrals that need to be made.
    - Examples include clearance for activity, sleep study, or physical therapy.
  - Additional assessment for next visit - ask the patient to track their intake and current physical activity.
  - Make the next several follow-up appointments within 1-2 weeks of each other

Polling question What class of obesity does John have a. Class 0 b. Class 1 c. Class 2 d. Class 3	Polling question Based on AACE staging, what stage of obesity is John classified as a. Stage 0 b. Stage 1 c. Stage 2 d. Stage 3
Polling question What data do we need for the next visit a. Food tracking b. His choice of an eating plan c. Number of steps he takes in a day d. Which medication he would like to start	

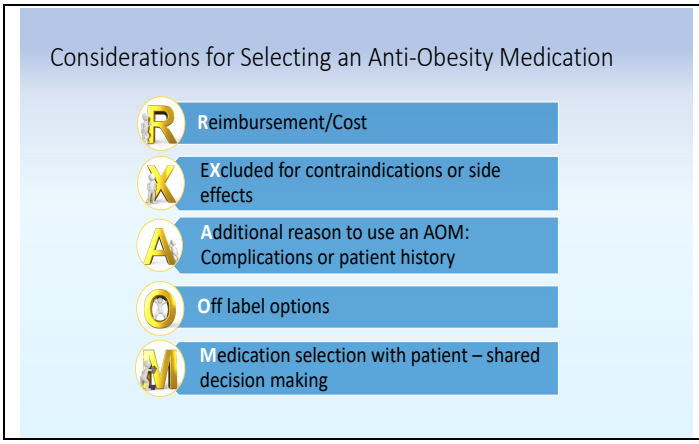
Visit Two

- History
  - Review food tracking
  - Review physical activity tracking
- Physical Examination
  - VS

    - Minimal physical is needed
- Assessment and diagnosis
    - Identify obesity code and any ORCs
- Plan
    - Set short term and long-term goals of treatment
    - Select an eating plan or begin making modifications of eating (ex: decreasing fast food intake) – make a SMART GOAL
    - Monitor hunger
    - Discuss possibility of intensification of treatment with medication and or surgery
    - Educational handout related to obesity and treatment

Visit Three

- History
    - Review food tracking and SMART GOAL from previous visit – any roadblocks to meeting the goal
    - Review any needed information related to ORCs (ex: patient has HTN and may review BP logs
- Physical Examination
    - VS
    - Minimal physical is needed
- Assessment and diagnosis
    - Identify obesity code and any ORCs
- Plan
    - Revisit eating decisions – modifications with smart goals versus meal plan
    - Create new SMART GOAL around eating for next two week
    - Complete RXAOM or referral to bariatric surgery program
    - Evaluate if any plan is needed for any ORCs you assessed
    - ILI – select an education handout for today – 5-minute



	R	X	A	O	M
Liraglutide					
naltrexone bupropion					
orlistat					
phentermine					
phentermine topiramate					
Semaglutide					

Visit Four

- History
    - Review food tracking and SMART GOAL from previous visit – any roadblocks to meeting the goal – if so ask patient what prevented them from meeting their goal
    - Review any needed information related to ORCs (ex: depression – new PHQ9 to assure still in remission)
- Physical Examination
    - VS

    - Minimal physical is needed
- Assessment and diagnosis
    - Identify obesity code and any ORCs
- Plan
    - Revisit eating decisions – modifications with smart goals versus meal plan – problem solve for any roadblocks and create new SMART GOAL around eating for next two week
    - Two options
        - Start Activity discussion (if doing this then set a SMART goal) or
        - Select medication and order (or start prior authorization)
    - Evaluate if any plan is needed for any ORCs you assessed
- ILI – select an education handout for today – 5-minute review of the handout

Visit Five

- History
    - Review food tracking and SMART GOAL from previous visit – any roadblocks to meeting the goal – if so ask patient what prevented them from meeting their goal
    - Check for S.E. of medication – evaluate hunger on the beginning dose – if not improved then increase dose if medication selected has dose changes
    - Review any needed information related to ORCs (ex: depression – new PHQ9 to assure still in remission)
- Physical Examination
    - VS
    - Minimal physical is needed
- Assessment and diagnosis
    - Identify obesity code and any ORCs
- Plan
    - Revisit eating decisions – modifications with smart goals versus meal plan – problem solve for any roadblocks and create new SMART GOAL around eating for next two week
    - Monitor medication
    - Start activity discussion if not already doing so
    - Evaluate if any plan is needed for any ORCs you assessed
    - ILI – select an education handout for today – 5-minute review of the handout

Visit Six and on…

- evaluating patients' SMART goals
    - help determine behavior changes needed

- evaluate patient if losing weight
    - on medication, as you approach week 12 at the maximum dose, assure the 4-5% weight loss
        - if not will need to change medication
- evaluate impact on quality of life
- evaluate impact on ORCs prepared to change any ORC medication

Visit as Obesity with Integrated Primary Care
Intake

- Susan, 36-year-old woman, arrives at the office for her a new patient intake. She is new to the area and is establishing for primary care
    - All new patients have a measured height
- The MA notes a BMI of 34 – this triggers the system in place
    - In the room the MA explains to the patient that a new "vital sign" has been added - a waist circumference
    - BMI is 34 with a waist circumference of 40"

Visit Zero
History

- PMH
    - migraines, DM, HTN, osteoarthritis, asthma
- SH: married with one child 8 years old. Works as an accountant part time.
- Pregnancy prevention plan: husband had vasectomy
- FH: all of family are heavy and most have DM, HTN, dad had an MI, no cancer history
- Medications
    - sumatriptan prn (uses 10-15 times a month)
    - propranolol 80 mg ER for headache prevention (started two months ago before leaving previous practice
    - losartan 50mg, HCTZ 12.5mg
    - ibuprofen daily 800mg bid, albuterol inhaler as needed, uses 5-6 times a month
    - montelukast 10 mg daily
    - metformin 2000mgER
    - empagliflozin 10mg qam (started two months ago)
- ROS
    - General: generally able to accomplish all activities of daily living - works as a medical assistant, no change in strength or exercise tolerance.
    - Head: No headaches, no vertigo.
    - Eyes: Normal vision, no diplopia.
    - Chest: No dyspnea. Has not used inhaler in past four weeks
    - Heart: No chest pains, no palpitations, no syncope, no orthopnea.

    - Abdomen: no dysphagia, no abdominal pains, no bowel habit changes, no emesis.
    - Neurologic: No weakness, no tremor, no seizures, no changes in mentation. Has not needed sumatriptan in past month
    - Endocrine: no changes in skin, no excessive thirst or urination
    - Psychiatric: No depressive symptoms, no changes in sleep habits, no changes in thought content.
    - Sleep – wakes feeling tired everyday
    - Pain – knees are painful when walking daily.
- Objective
    - VS: 130/88 HR 80 RR 16 66" 260# BMI 42
    - General: patient in NAD, cooperative with examiner, well groomed, alert and oriented x 4.
    - Eyes: PERRL, conjunctivae clear, no discharge, . Ears: Canals clear bilaterally, TM's normal bilaterally. Nose: Moist, pink mucosa without lesions or mass. Throat: no exudates, no erythema. Fundoscopic exam: Disc margins are sharp, cup to disc ration <50%, no AV nicking, no exudates or hemorrhages noted
    - Neck: Supple, no masses, no thyromegaly, no bruits, no lymphadenopathy
    - Chest: BSCTA = bil, no rales, no rhonchi, no wheezes, speaking in full sentences, respirations non labored
    - Heart/CV: RR, no rubs, no gallops; Radial and pedal pulses 2+ = bil
    - Abdomen: bowel sounds normal, percussion tones nl, SNT without rebound, no masses, no hepatomegaly
    - Neuro: A&O x 4, CN II-XII grossly intact, stable gait, romberg negative, DTR's 2+ and = bilaterally, recent and distant memory grossly intact.
    - Extremities: Warm, well perfused, no edema, grips and pushes 2+ = bilaterally.
    - Skin: no noted acanthosis nigricans, no striae
- Next steps
    - ask permission to discuss weight/obesity
    - explain the disease (your 2-minute spiel – not a longer version)
    - provide your brochure
    - ask her to make an appointment with you for this

Visit 1

- VS 136/82 HR 82 RR 16
- Weight history
    - patient has been as high as 300 #, 5'6
    - has been attending WW for past four months – did this previously and then regained

    - Finds she has cravings for food most evenings, especially sweets
- No specific activity – walks about 3000 steps a day using her watch to monitor, but can't walk more as it is too painful
- Review labs from previous provider done 2 months ago
    - Dyslipidemia (patient unaware) Total cholesterol is 245, LDL is 134, triglycerides 273, HDL 38
    - DM: HBGA1C 8.4
    - Liver enzymes: AST 82 and ALT 92
- Medications: sumatriptan, propranolol, losartan, ibuprofen, albuterol inhaler, montelukast, metformin, empagliflozin
- Screening tools: PHQ9 3, BED-7 0, STOP Bang 5, PARQ – pain in knees
- PE: Patient is alert and oriented x 4, recent and remote memory intact. Breathing is non labored, patient speaking in full sentences. Radial pulse has RRR. Skin is normal color, cap refill is < 2 seconds. Gait is normal.
- Assessment: migraines, DM, HTN, osteoarthritis, asthma, hyperlipidemia, elevated liver enzymes, obesity

Polling question What class and stage would Susan's obesity be classified as:	a. Class 1, Stage 2 b. Class 2, Stage 1 c. Class 2, Stage 2 d. Class 3, Stage 3

- Assessment: migraines, DM, HTN, osteoarthritis, asthma, hyperlipidemia, elevated liver enzymes, obesity
- Medications: sumatriptan, propranolol, losartan, ibuprofen, albuterol inhaler, montelukast, metformin, empagliflozin
- Screening tools: PHQ9 3, BED-7 0, STOP Bang 5, PARQ – pain in knees
- PE: Patient is alert and oriented x 4, recent and remote memory intact. Breathing is non labored, patient speaking in full sentences. Radial pulse has RRR. Skin is normal color, cap refill is < 2 seconds. Gait is normal.

Polling question All of the following are likely referrals at this point except:	a. Physical therapy b. Sleep specialist c. Orthopedics d. Cardiologist

- Next steps
    - WHY? – why is patient being treated – drill down on this
    - Track food until next visit
    - Stop propranolol, monitor BP and migraine incidence
    - May need to add medication for diabetes, ask patient to monitor fasting glucose and three 2 hour post prandial
    - Referrals

        - sleep study (STOPBANG score and neck circumference)
        - physical therapy if patient unable to walk without pain
    - Follow-up visit 2 weeks
    - Handouts provided: mindfulness and meal planning

Visit 2

- History
    - Review food log – eats fast food 3-4 times a week, drinks NSS beverage – 32 ounces a day, CHO 330 average, PRO – 35, calories 1500-2800 range
    - Review physical activity – averaging 3000 steps a day
    - ROS: no changes, has not had to use albuterol or sumatriptan
- VS: 128/82 HR 78 RR 16 pOx 98% 207# BMI 33.41
- PE: Patient is alert and oriented x 4, recent and remote memory intact. Breathing is non labored, patient speaking in full sentences. Radial pulse has RRR. Skin is normal color, cap refill is < 2 seconds. Gait is normal
- FBS: range 98-168, 2PP 200-210
- Assessment
    - migraines, DM, HTN, osteoarthritis, asthma, hyperlipidemia, elevated liver enzymes, obesity
- Plan
    - Has patient got appointments with referrals?
    - Handouts – protein grams and protein snacks, hunger scale, medication handout
    - Determine food plan
        - Selecting a plan or modification process
            - 30 grams of protein with breakfast
            - Decrease CHO to less than 200 – use log to teach what a CHO is
        - CREATE SMART GOAL related to food for next visit
            - Reduce carbohydrates to under 200gms/day
        - Needs to monitor hunger for next visit
    - Discuss AOM for intensification of obesity treatment

Visit 3

History

- Go over tracking of food and water intake
- Had 30 grams protein 5 day of 7 – not on weekends
- Review SMART GOAL – any roadblocks
    - CHO under 200gms every day
- Revisit eating decisions – modifications with smart goals versus meal plan
- Continue with modifications

    - Could decrease fast food or continue to decrease carbohydrate load
- VS: 126/84 HR 80 RR 16 pOx 97% 204# BMI 32.92
- Plan
    - ILI – select an education handout for today – 5-minute review of the handout
    - Create SMART GOAL around eating for next two week
        - Continue to decrease carbohydrates – new goal 150 gms – use diary to find more places to decrease CHO
- Evaluate patient hunger and discuss the use of medication to impact the hormonal dysregulation
    - Patient reports hunger especially at night still high
- Ask about asthma – any use of rescue inhaler? (no)
- Ask about migraines – any need for Imitrex (once in past week)
- Evaluate blood sugars – FBG range 94-136, 2PP 180-200 (have improved with change in eating), but still elevated, increase empagliflozin to 25mg

	R	**X**	**A**	**O**	**M**
Liraglutide					
naltrexone bupropion					
orlistat					
phentermine					
phentermine topiramate					

Semaglutide					

Polling question What medication is your first choice for Susan?	a. liraglutide b. naltrexone/bupropion c. phentermine d. phentermine/topiramate e. semaglutide

Visit 4

- Go over tracking of food and water intake
    - Continues adding protein at breakfast
- Review SMART GOAL – any roadblocks
    - Met CHO goal 10 of 14 days
        - Stop here and determine the issues on the other 4 days – help patient look for solutions
- Revisit eating decisions – modifications with smart goals versus meal plan
- Medication decision for antiobesity medication – opted for phentermine/topiramate ER
- Sleep specialist study results back – patient has OSA and beginning fitting or BiPAP
- VS: 128/82 HR 78 RR 16 pOx 98% 202# BMI 32.60
- BS after increase empagliflozin to 25mg
    - FBG range 88-98, 2PP 150-168 (have improved with change in eating)
- Plan
    - Create SMART GOAL around eating for next two week
        - Same goal of 150 gm/day or less, increase protein to 80gms/day
    - Handout – medication, pregnancy prevention, informed consent
        - Pregnancy prevention is monogamous relationship and husbands' vasectomy
    - ILI – select a VAMove education handout for today – 5-minute review of the handout

Visit 5

- Check for S.E. of medication – evaluate hunger on the beginning dose – if not improved then increase dose
- Go over tracking of food and water intake
    - CHO under 150 each day

        - 30 gms protein daily for breakfast and averaging 50 gms/day
    - Review SMART GOAL – any roadblocks
        - Difficulty getting protein gms higher
    - Revisit eating decisions – modifications with smart goals versus meal plan
        - Increase protein to 1-1.2gm/kg
    - Create SMART GOAL around eating for next two week
        - Increase protein to 80 mg/day – refer to protein handouts given previously
        - SMART Goal
            - Increase steps by 500 each day to 4000 total
    - Evaluate migraine incidence, use of asthma rescue inhaler and BS logs
    - ILI – select a VAMove education handout for today – 5-minute review of the handout

Visit 6

- Check for S.E. of medication for obesity – evaluate hunger on the beginning dose – if not improved then increase dose
- Check on use of rescue inhaler, use of migraine medication
- Go over tracking of food and water intake
    - CHO under 150 each day
    - 80 gms protein daily
- Review SMART GOAL – any roadblocks
    - none
- Create SMART GOAL around eating for next two week
    - Increase protein to 80 mg/day – refer to protein handouts given previously
    - Protein at 65 gms per day – need to work on the roadblocks to increase protein.
- ILI – select a VAMove education handout for today – 5-minute review of the handout

Visit 7-22 continues

- Food
- Activity
- Weight
- Goals for QOL
- Other diseases intermittently during these visits

Practice Concepts	• During the history and physical you are also looking for secondary causes of obesity; Cushings, genetic syndromes, obesogenic medications, recent smoking cessation, and don't forget to test for pregnancy as it is a cause of weight gain
	• Recognize other providers that can support the obesity treatment team
	• This is a journey in a chronic, relapsing, AND treatable disease, so partner with your patient to provide long term care
	• Obesity must be treated in primary care
	  • The numbers demand it
	• Evidence Based Treatment as a chronic disease in primary care could impact
	  • US economy
	  • Workforce productivity
	  • Military readiness
	• Listen to the patient, be empathetic, this will go a long way towards building a relationship the patient trusts and can provide a good base for continuing treatment.
	• Having a chronic care model does not require a large health system, you can create one using your own practice and community services.
	• Adipose tissue has many roles beyond lipid storage and vital organ protection
	• Adipose cells are endocrine in nature producing protein, cytokines, and hormones
	• Hormones and peptides must be in harmony to control appetite and energy regulation effectively
	• Obesity has different causes for different people and is not one disease.
	• Acknowledge that patients with a diagnosis are more likely to get treatment.
	• Staging the disease has value for morbidity and mortality
	• Treating obesity treats many other diseases seen and treated in primary care
	• Recognizing that there is greater urgency with the need for more aggressive therapy if the patient has complications and/or comorbidities with obesity.
	• No eating plan is THE plan for everyone