

Obesity: Defining and Treating

James Cook MD FACOG
Assistant Professor of
OB/GYN
University of South Carolina
School of Medicine

Diplomate American Board
of Obesity Medicine

James.Cook@uscmed.sc.edu





Fed up with how her diet is going, Charlene takes a more serious aim at her target weight.

Please go to Kahoot.it
pin = XXXX



Question

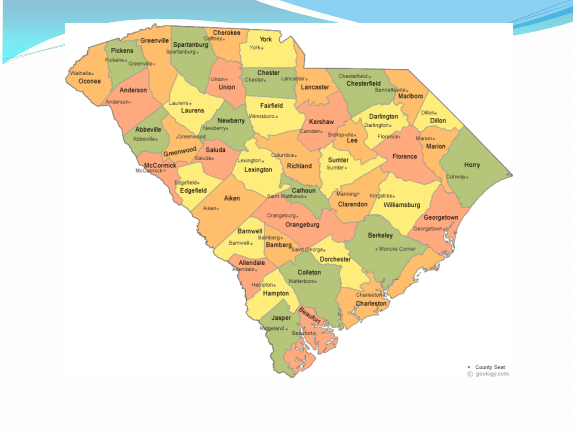
- 56 yo AA G1P1 whose PMH is complicated by HTN, DM, Obesity (BMI 42), insomnia and tobacco abuse presents for routine follow up. She reports she continues to gain weight since menopause
 - Current Meds: Labetalol, regular/NPH insulin BID
 - Over the counter meds: ZzzQuil
- Her recent labs (CMP, A1C, and UA are all normal) and her BP is reasonably controlled.

Question

- In addition to your exam you:
 - reviewing her exercise and food intake,
 - provide your patient with an exercise prescription and discuss food intake. She elects to see a RD and enrolls in a community sponsored "group walk".
 - discuss behavioral therapy, and elects to see a counselor

What would you do?

- Continue her on her Labetalol since JNC-7 states BB are an initial therapy option for DM, and she is well controlled
- Congratulate her on her well controlled DM and keep her current diabetic meds
- Advise her to keep smoking, because it will help keep the weight "in check"
- Inform her that her diphendramine is weight promoting



Community Questions

- 1. Is there an Obesity Medicine Specialist (surgical and/or non-surgery) in your county, if not whom is close?
- 2. What Registered Dieticians are available for consultation? Will they work on a sliding scale?
- 3. What community resources are available?
 - Exercise groups
 - Overeaters anonymous
 - Counseling for Behavioral Therapy

What would you do?

- A. Continue her on her Labetalol since JNC-7 states BB are an initial therapy option for DM, and she is well controlled
- B. Congratulate her on her well controlled DM and keep her current diabetic meds
- C. Advise her to keep smoking, because it will help keep the weight "in check"
- D. Inform her that her diphendramine is weight promoting

Complications of Obesity

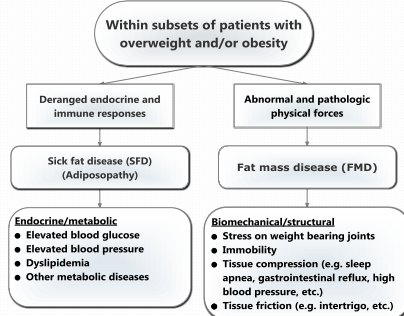
- Hypertension
- Hyperlipidemia
- Coronary heart Disease
- Type 2 DM
- Respiratory Disease (OSA)
- Gastrointestinal Disease (NAFLD and NASH)
- Cancer
- Rheumatologic diseases (Osteoarthritis , gout)
- Psychiatric

BMI 30 -35 = life expectancy is reduced by 2-4 years
 BMI 40 -45 = life expectancy is reduced by 8-10 years

Definition of Obesity

- National Institute of Health (NIH) and World Health Organization (WHO)
 - Recommend use of BMI
 - BMI 25-29.9 = overweight
 - BMI 30-34.9 = Class 1 obesity
 - BMI 35-39.9 = Class 2 obesity
 - BMI ≥ 40 = Class 3 obesity
 - Class 3 is also called "extreme" and "severe", replacing "morbid"

Obesity as a disease



Adiposopathy

fat tissue as an organ contribute to the following:

- (1) Promotion of blood vessel formation (angiogenesis)
- (2) fat cell recruitment and development adipogenesis
- (3) dissolving and reforming the structures around fat tissue (extracellular matrix)
- (4) generation, storage and release of fat
- (5) growth factor production
- (6) glucose metabolism
- (7) production of factors that affect blood pressure (such as those associated with the renin-angiotensin system)
- (8) fat and cholesterol metabolism
- (9) enzyme production
- (10) hormone production
- (11) steroid metabolism
- (12) blood clotting (hemostasis)
- (13) element binding
- (14) immune response

Obesity and Female Fertility/Pregnancy

- Prenatal
 - Miscarriage, GDM, Preterm Birth (both indicated and spontaneous), Post term, Multifetal pregnancy, UTI, Hypertensive D/O (risk of Pre-e doubles with each increase of 5 kg/m²)
- Intrapartum
 - Dysfunctional labor, Higher induction rates, TOLAC, CD, Shoulder dystocia, anesthesia management
- Postpartum
 - Infection, Postpartum Hemorrhage, breastfeeding, venous thromboembolism, contraception
- Perinatal Outcome
 - Congenital anomalies, Death, LGA, Asthma

Nuthalapaty, FS, Rouse DJ. The Impact of obesity on female fertility and pregnancy. UpToDate. literature review current through Jan 2015

Primary Causes of Obesity

- Monogenic Disorders
 - Melanocortin-4 receptor mutation
 - Leptin deficiency
 - POMC deficiency
- Syndromes
 - Prader-Willi
 - Bardet-Biedl
 - Cohen
 - Alström
 - Froehlich

Secondary Causes of Obesity

- Neurological
 - Brain Injury
 - Brain Tumor
 - Consequences of cranial irradiation
 - Hypothalamic obesity
- Psychological
 - Depression
 - Eating Disorders
- Endocrine
 - Hypothyroidism
 - Cushing Syndrome
 - GH Deficiency
 - Pseudohypoparathyroidism
- Drug Induced

Routine Laboratory

Adiposity-relevant Blood Testing

- Fasting blood glucose
- Hemoglobin A1c
- Fasting lipid levels
 - Triglycerides
 - Low-density lipoprotein (LDL) cholesterol
 - High-density lipoprotein (HDL) cholesterol
 - Non-HDL cholesterol
- Liver enzymes and other liver blood tests
 - Aspartate aminotransferase (AST)
 - Alanine aminotransferase (ALT)
 - Alkaline phosphatase
 - Total bilirubin
- Electrolytes (i.e., potassium, sodium, calcium, phosphorous, etc.)
- Renal blood testing (i.e., creatinine, blood urea nitrogen, etc.)
- Uric acid
- Thyroid stimulating hormone (TSH)
- Vitamin D levels

General Laboratory Testing

- Complete blood count
- Urinalysis
- Urine for microalbumin

Reference: [1] [55]

Treatment options and goals



Weight Loss Goals:

- 5-10 % can significantly reduce development of diabetes in those with pre-diabetes, reduce blood pressure and risk factors for Cardiovascular dz
- Goals of weight loss should be reduction in risk for coronary vascular disease and other co-morbidities. If this is the goal, in most patients a 10% reduction will accomplish this.

Recommendations by BMI

- diet, exercise, and behavioral modification = everyone >25
- pharmacotherapy
 - ≥ 27 with comorbidity or
 - ≥ 30
- bariatric surgery
 - ≥ 35 with comorbidity or
 - ≥ 40
- Drugs may
 - amplify adherence to behavior change and
 - improve physical functioning such that increased physical activity is easier in those who cannot exercise initially.
- "history of being unable to successfully lose and maintain weight"

Exercise Recommendations

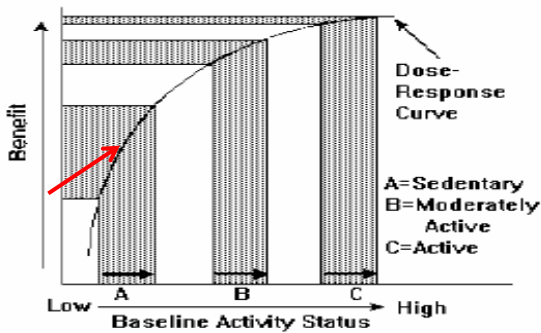
- Exercise as sole treatment has been shown very modest benefits in weight (1.6 kg in study)
 - Exercise alone does have benefits on body composition
 - Reduction in total body fat
 - Reduction in abdominal obesity and insulin resistance

Exercise Benefits

- Benefits of exercise for overweight/obese
 - Improve glycemic control and prevention of type 2 Dm
 - Benefits serum lipoprotein, aerobic capacity, improving hemostatic components of thrombosis
 - Blood pressure
 - Correlation with decreased cardiovascular risk

Scand J Med Sci Sports. 2006 Feb;16 Suppl 1:3-63.
Evidence for prescribing exercise as therapy in chronic disease.
 Pedersen BK, Saltin B.

Dose-response Curve for Exercise



ACSM & AHA 2007, HHS 2008

Healthy Adults age 18-64

- Aerobic Physical Activity for Maintenance
 - Moderate intensity: 150 minutes/wk, OR
 - Vigorous intensity: 75 minutes/wk (or a combo)
 - 10 min at least, preferably spread throughout week
- Aerobic Physical Activity for weight loss
 - Moderate intensity: 300 minutes/wk, OR
 - Vigorous intensity: 150 minutes/wk (or a combo)
- Muscle Strengthening Activity
 - 2 or more days/wk
 - 8-10 exercises
 - 8-12 reps (one set)

Physical activity and public health: Updated recommendation for adults from the ACSM and AHA. MSSE 2007. and HHS publication October 2008.

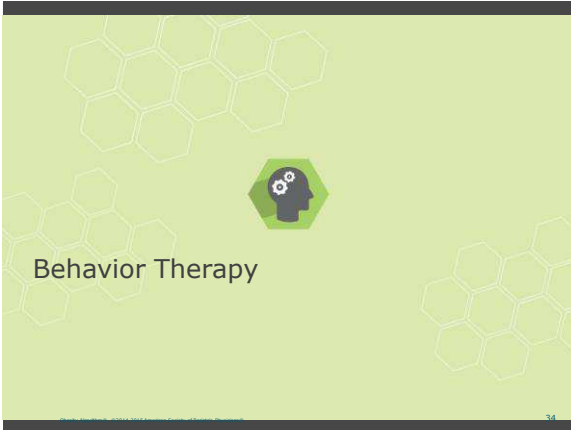


How to Write an Exercise Prescription



Rx: Be "FITT"

- Frequency
- Intensity
- Time (duration)
- Type



Behavior Therapy

34

- The goal of behavioral therapy is to help patients make long-term changes in their eating behavior by:
 - modifying and monitoring their food intake,
 - modifying their physical activity, and
 - controlling cues and stimuli in the environment that trigger eating.

Behavior Therapy Techniques

Elements for Optimal Success

- Doable**
 - Practical
 - Accessible
 - Frequency
 - Consistency
- Efficacious**
 - Evidence based
- Measurable**
 - Feedback
 - Trackable
 - Verifiable
- Self-ownership**
 - Anonymous stakeholder
 - Personal stakeholder
 - Positive reinforcement
 - Negative reinforcement

1

Behavior Therapy

Frequent Encounters with Medical Professional or Other Resources Free from Provider Bias

- Physician
- Dietitian
- Nurse educator
- Advanced practitioners
- Physical activity professional trainer (i.e., trainer, physiologist, etc.)
- Mental health professional
- Web-based programs
- Mobile access (i.e., text messages, applications, etc.)
- Multidisciplinary approach
 - Clinicians with professional expertise
 - Patient with self expertise

Education

- Medical health
- Mental health
- Nutrition
- Physical activity
- Establish healthy sleep habits
- Establish healthy eating habits (i.e., reduce speed of eating, drink water between meals, choose and have available healthy snacks, etc.)
- Recognize and anticipate inevitable weight-loss plateaus

Reference/s: [50] [51] [52]

37

Behavior Therapy

Stimulus Control

- Avoid eating for reasons other than hunger
- Avoid frequent snacking
- Avoid binge eating
- Utilize portion control
- Environmental removal of foods identified as especially tempting for the individual patient

Cognitive Restructuring

- Address matters of body image
- Identify and establish a plan to counteract unhelpful or dysfunctional thinking leading to unhealthy behaviors and actions
- Emphasize rationale of aggressive yet realistic weight-loss expectations through an emphasis on weight loss as a matter of medical and mental health
- Encourage patient to:
 - Acknowledge he/she is capable of positive thoughts and behaviors
 - Replace unhelpful thoughts and behaviors with more productive ones
 - Practice behavior therapy skills between clinician encounters

Reference/s: [54] [55]

38

Behavior Therapy

Behavioral Contracting

- Tokens of reward
- Financial incentives

Problem Solving, Social Support, and Other Reinforcement Contingencies

- Stress management
- Establish alternative back-up procedures to engage during times that challenge adherence to agreed upon plans (e.g., stressful periods, life changes, etc.)
- Health care team support
- Mental health professional
- Other group or social support
- Commercial weight loss/maintenance programs
- Encourage interactions with others that may provide positive recognitions for successes

39

Behavior Therapy

Goal Setting

- Patients are given step-by-step instructions to accomplish goals (i.e., nutrition and physical activity prescriptions)
- SMART
 - Specific
 - Measurable
 - Assignable
 - Realistic
 - Time-related
- Goals beyond body weight alone may include overall improvement in physical and mental health, possibly resulting in reduction of concurrent medications

Self Monitoring

- Daily or weekly body weights
- Other routine self-anthropometric measurements (i.e., calipers for percent body fat, tape measure for waist circumference, myotape for muscle mass, etc.)
- Food diaries (including online services or mobile applications)
- Physical activity logs
- Pedometer/accelerometer measures
- Changes in clothing size
- Photo journaling

Cognitive Behavioral Therapy

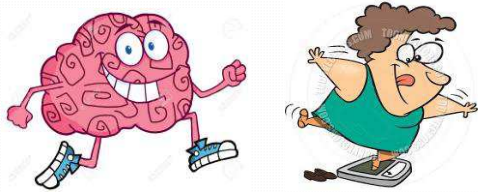
- "Cognitive Behavioral Therapy (CBT) is a blend of cognitive therapy and behavioral therapy and aims to help a patient modify his/her insight and understanding of thoughts and beliefs concerning weight regulation, obesity and its consequence"
- directly addresses behaviors that require change for successful weight loss and weight loss maintenance.
- based on the idea that our **thoughts** cause our feelings and behaviors, not external things, like people, situations, and events. The benefit of this fact is that we can change the way we think to feel / act better even if the situation does not change.
- Briefer and quicker to complete than most forms of therapy
- Homework is an important component

Bariatric Surgery Referral

- National Institutes of Health (NIH) Consensus Development Panel :
 - Have a BMI ≥ 40 kg/m²
 - Have acceptable risk for surgery
 - Have failed previous non-surgical weight loss
 - Be well-informed and motivated
 - BMI ≥ 35 kg/m² who have serious comorbidities such as severe diabetes, sleep apnea, or joint disease

Review of concurrent MEDS

- Pharmacological Management of Obesity: An Endocrine Society Clinical Practice Guideline
 - C. Apovian et al. J Clin Endocrinol metab 2015, 100(2):342-362



Use **weight-losing and weight-neutral** medications as **first- and second-line agents** with T2DM who is overweight or obese.

- Weight Losing or neutral DM Meds:
 - metformin
 - mediates a phenotypic shift away from lipid accretion through AMP-activated Protein Kinase-Nicotinamide phosphoribosyltransferase-Sirtuin 1-mediated changes in metabolism supporting treatment for obesity
 - GLP-1 (liraglutide, exenatide, dulaglutide)
 - POMC stimulation (reduced food intake), enhancement of glucose-dependent insulin secretion, slowed gastric emptying, reduction of post-prandial glucagon
 - SGLT-2 Inhibitors (dapagliflozin and canagliflozin)
 - reduce renal glucose reabsorption in the proximal convoluted tubule, leading to increased urinary glucose excretion



- Weight promoting DM Meds:
 - insulin, sulfonylureas, and other insulin secretagogues (glitinides and thiazolidinedione)

- If T₂DM requires Insulin:
 - Use basal over premixed or combination
 - Add one of the following:
 - metformin, or
 - pramlintide, or
 - GLP-1 agonists

- metformin plus Insulin => yield similar glycemic benefits to Insulin alone without excessive additional weight gain
- Amylin Analogs (Pramlintide) or GLP-1 agonist (exenatide) plus Insulin => possible improvement in both A1C and weight

- For HTN and Obese
 - Avoid β -adrenergic blockers as first-line therapy
 - Consider:
 - (ACE) inhibitors
 - Angiotensin is overexpressed in Obesity, renal protective
 - angiotensin receptor blockers (ARBs)
 - No weight gain and renal protective in DM
 - calcium channel blockers
 - No change in weight or adverse change in lipids

- If β -blockers required,
 - Consider selective or nonselective β -blockers with a vasodilating component (carvedilol and nebivolol)
 - less weight gain potential and less of an impact on glucose and lipid metabolism than other nonselective β -blockers

Antidepressants

- Strongest evidence available shows:
 - Weight gain = amitriptyline and mirtazapine
 - Weight loss = bupropion and fluoxetine
- SSRI
 - Weight promoting = paroxetine
 - Weight neutral = citalopram and escitalopram
 - Weight loss = fluoxetine and sertraline

- TCA
 - amitriptyline and nortriptyline = weight promoting
 - imipramine = weight neutral

Antipsychotics

- % of patients with weight gain >7%
 - 30% olanzapine (3.6 kg)
 - 16% quetiapine
 - 14% risperidone
 - 12% perphenazine
 - 7% ziprasidone (1.0 kg)
- when olanzapine changed to ziprasidone ==> weight loss was associated with improvements in their serum lipid profile and glucose tolerance

Antiepileptic drugs (AED)

- Weight gain = Gabapentin, pregabalin, valproic acid, vigabatrin, and carbamazepine
- Weight Neutral = lamotrigine, levetiracetam, and phenytoin
- Weight loss = felbamate, topiramate, and zonisamide

Antiepileptic drugs (AED)

- Valporic Acid =
 - mild-to-moderate weight gain (5 to 10% of baseline weight) was shown in 24% of patients
 - marked weight gain (>10% gain of baseline weight) was shown in 47% of patients

Contraception

- If BMI > 27 kg/m² with comorbidities
- or BMI > 30 kg/m²
 - Recommend oral contraceptives over injectable medications

Obesity Pharmacotherapy

Obesity Pharmacotherapy

- BMI ≥ 27 kg/m² with comorbidity or BMI over 30 kg/m²)
- Used as adjuncts to comprehensive lifestyle
 - Drugs may:
 - amplify adherence to behavior change
 - improve physical functioning such that increased physical activity is easier in those who cannot exercise initially
- Reasonable with a **history** of being unable to successfully lose and maintain weight and

Obesity Pharmacotherapy

- Need to check efficacy and safety
 - at least monthly for the first 3 months,
 - then at least every 3 months in all patients prescribed weight loss medications.
- Medication is deemed effective and continued if
 - Weight loss of $\geq 5\%$ of body weight at 3 months
 - Safe
 - Tolerable
 - *Discontinue if the above are not met*

FDA approved Drugs for Obesity

- Antiepileptic (Topiramate)
 - GABA receptor modulator
 - Should not be used as mono-therapy
 - Approved with Phentermine
 - Unclear how Topiramate enhances appetite suppression, however combination more effective than phentermine alone

FDA approved Drugs for Obesity

- Serotonin agonists (Lorcaserin)
 - Selective agonist of serotonin 2C receptor
 - 15-100 times functional selectivity over 2A or 2B
- Alter Fat Digestion (Orlistat)
 - Inhibits pancreatic lipases, therefore fat is not completely hydrolyzed and fecal fat excretion is increased

FDA approved Drugs for Obesity

- Diabetic Drugs (Liraglutide)
 - GLP-1 agonist
 - Sub-Q dosing, daily
 - Enhancement of glucose-dependent insulin secretion
 - Slowed gastric emptying
 - Reduction of post-prandial glucagon
 - Reduced food intake through stimulating of POMC

- Phentermine
 - approved for weight loss, but not long term use
 - addictive potential is low
 - cheap(Compared to other weight loss meds)
 - minimal evidence of long term side effects

Phentermine Use Requirements

- 1) has no evidence of **serious cardiovascular disease**;
- 2) does not have serious **psychiatric** disease or a history of **substance abuse**;
- 3) has been **informed** about weight loss medications that are FDA approved for long-term use and told that these have been
- 4) does not demonstrate a clinically significant increase in **pulse** or **BP** when taking phentermine
- 5) demonstrates a significant **weight loss** while using the medication

NON-FDA approved

HCG diet = **NOT** more effective then placebo



Managing post-bariatric Patient

- Clinical Practice Guidelines for the Perioperative Nutritional, Metabolic, and Nonsurgical Support of the Bariatric Surgery Patient- 2013 Update: Cosponsored by the American Association of Clinical Endocrinologists, The Obesity Society, and American Society for Metabolic and Bariatric Surgery
 - Mechanick et al, Surgery for Obesity and Related Diseases 9 (2013) 159-191

Management of the post-bariatric patient

- Screening for vitamin deficiencies (3,6,12 months and then annually)
 - check Ca, Vit D, Vit B1, Vit B12, folate, Iron Studies, zinc
- Screening for Osteoporosis and Osteopenia
 - Bone density at sugery and then q 2 years
 - Only use Bisphospanate if Calcium and Vit D fail
 - Can't take oral, must take as IV

Management of the post-bariatric patient

- Depression
 - Bioavailability of SSRI meds are reduced after RYGBA
- Stenosis following Gastric Sleeve –
 - lead to gastric outlet obstruction, present as dysphagia or vomiting
- T2DM –
 - monitor A1C
- Sleep apnea
 - reassess in q 6-12 months

Management of the post-bariatric patient

- Pain Control
 - Don't use NSAIDS
 - Tylenol with codeine
- Supplementation
 - multivitamin with Fe, folate, thiamine
 - calcium citrate
 - vitamin D
 - vitamin B12
 - Iron(optional)

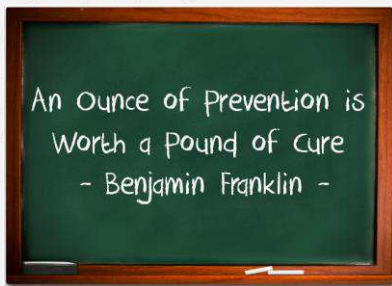
Management of the post-bariatric patient

- Long Term
 - Drink H2O
 - avoid carbonation and straws
 - avoid gastric bloating
 - no caffeine
 - diuretic affect
 - no processed snack food or sweetened beverages
 - unnecessary caloric intake

Management of the post-bariatric patient

- Dumping syndrome
 - particularly evident after sweets
 - presents as tachycardia, abd. pain, diaphoresis, n/v, diarrhea
- Gastrojejunal ulcer
 - avoid tobacco, asa, nsaid
 - rx with PPI and sucralfate
- Cholelithiasis
 - common due to rapid weight loss promotes gallstone formation
 - rx with ursodiol
- Nephrolithiasis
 - 8% of RYGB therefore avoid dietary oxalate

Prevention



Group Questions 1

- 33 yo G3P3 with Obesity (BMI 42) presents for a discussion of contraception. She has had three unplanned pregnancy's because of difficulty remembering to take her "pill".
 - Which contraception options would you recommend?

Group Questions 2

- 32 yo Go with BMI = 27 and has no Medical issues. She is concerned that despite her intense exercise routine and diet, which she assures you she follows religiously, she has gained 5 lbs over 10 years. She asks you about starting the HCG diet, stating "All my friends are doing it and loosing massive weight?"
 - What would you tell her about the HCG diet?
 - What questions would you ask about her nutritional intake?
 - What questions would you ask about her exercise?

Group Questions 3

- 23 yo G3P1011 @ 29w5d with BMI of 36 and history of gestational DM reports that before she was pregnant her weight was better. (Chart review shows that her pregnancy BMI was 29)
 - She states she is concerned because she saw on-line that a BMI of 36 represents class 2 Obesity. What can you tell this patient about her obesity?
 - Which medications would you recommend that she use for weight loss?
 - If she becomes a gestational diabetic requiring meds, which would you recommend?

Group Questions 4

- 39 yo G4P1112 had Bariatric surgery 2 years ago and has had 60 lbs of weight loss and reduced her BMI to 26. She moved to your town 1 year ago and does not have a Bariatric Surgeon clinic to follow up with and would like to see you for all her care. When you ask about contraception she tells you "I am not concerned, I have had infertility for 10 years?"
 - What labs should you draw?
 - What supplements should she be on?
 - What do you think about her contraceptive plans?

Group Questions 5

- 50 yo G4P2022 with BMI = 47, DM (on once daily insulin with long acting agent) with decent control and Depression, treated by her psychiatrist with Paroxetine.
 - Would you change her diabetic treatment?
 - What do you think about her antidepressant? If you don't like it, how do you handle it since it's prescribed by another provider?

What would you do?

- A. Continue her on her Labetalol since JNC-7 states BB are an initial therapy option for DM, and she is well controlled
- B. Congratulate her on her well controlled DM and keep her current diabetic meds
- C. Advise her to keep smoking, because it will help keep the weight "in check"
- D. Inform her that her diphendramine is weight promoting

Questions or Comments?

