

EATING DISORDERS AND DIABETES:

WHEN THE SEARCH FOR OPTIMAL GLYCEMIC CONTROL & HEALTHY EATING GOES TERRIBLY WRONG

Nadine Mitchell, RDN, RN, BSN, CDE

E-mail address: nadine.mitchell@kadlec.org

OBJECTIVES

- o Identify types of eating disorders (EDOs) recognized by the DSM-V, and discuss how EDs and disordered eating behaviors (DEB) often don't fit this specific criteria.
- o Learn medical complications of different eating disorders.
- o Understand pathophysiology involved in the development of EDOs.
- o Understand how having DM increases risk of developing DEB.
- o Understand how DM education can influence development of DEB/EDO.
- o Learn strategies for helping EDO patients to eat more appropriately and improve nutrition status.
- o Identify screening tools the CDE or provider can use to identify EDOs.
- o Identify treatment options for patients with EDO.

WHY DOES THIS TOPIC MATTER?

- o There is a strong association between T2DM and clinically significant binge eating.
- o People with EDOs have the highest mortality rate of any mental health illness.
 - ~10% of patients die from their EDO.
- o People with T1DM are 2.4 times more likely to develop EDOs than their peers without DM.
 - Increased risk of disturbed eating behavior in girls with T1DM as young as 9 yrs old.
- o In T1DM, insulin omission is often used as a weight control method.
 - Result: higher A1c, higher infection risk, more episodes of DKA & ED room visits, and 3x higher risk of mortality than women who do not restrict insulin.



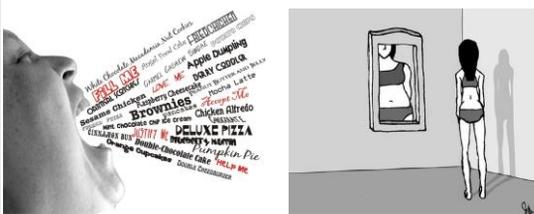
NOT TO ALARM YOU EVEN MORE, BUT...



- o Women with T1DM **and** EDO have A1c values $\geq 2\%$ higher than similarly aged women without EDO.
- o They also had increased rates of DM-related eye and nerve disease and more negative attitudes toward T1DM than women who do not report insulin restriction.
 - Even those who had DEB which were less risky had significant medical and psychiatric consequences **in the context of DM.**
- o Just considering insulin restriction, there was a 3-fold increase in mortality risk over an 11-year f/u period.
 - Insulin restriction becomes more prevalent in later adolescence and into adulthood.

Once the pattern of frequent and habitual insulin restriction takes hold, it becomes more difficult to treat the cycle of poor body image, depression, anxiety & shame, and poor glycemic control.





As CDEs, RDs, RNs & medical providers...

We need to be better at identifying patients engaging in disordered eating behaviors and intervene quickly to provide help and intervention before they become too enmeshed in unhealthy behaviors.



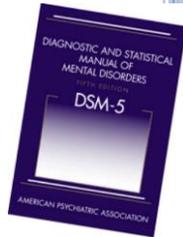
THE FIELD OF EDOs IS STILL NEW

Anorexia nervosa has been recognized for several decades, but...

- o Bulimia nervosa was first given its name in 1979.
- o Binge-eating disorder was first recognized in 2008.
- o The diagnostic criteria for EDOs are standardized to facilitate research & description. They DO NOT represent the human experience as a whole.
- o The research in this area is limited and not representative of the wide range of EDO presentations and behaviors.

EATING DISORDERS RECOGNIZED BY THE DSM-V

- o Anorexia Nervosa (AN)
 - Restricting Type
 - Binge-Eating/Purging Type
- o Bulimia Nervosa (BN)
- o Binge-Eating Disorder (BED)
- o Other Specified Feeding/Eating Disorder (OSFED)
- o Unspecified Feeding/Eating Disorder
- o Avoidant/Restrictive Food Intake Disorder (ARFID)
- o Rumination Disorder
- o Body Dysmorphic Disorder
- o Pica



- o Anorexia Nervosa:
 - Severe restriction of calorie intake resulting in significantly low body weight.
 - Intense fear of gaining weight or becoming fat even though underweight.
 - Disturbance in experience of weight or shape, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
 - Consequences of inadequate intake & course of the EDO:
 - o Bradycardia, heart palpitations, irregular HR, low HR orthostatic hypotension. Low energy level.
 - o Amenorrhea
 - o They feel cold all the time. They layer their clothes for warmth & to hide their thinness (some).
 - o Alopecia – clumps of hair on the pillow or the shower drain.
 - o Irritability, depression, poor memory/concentration.
 - o Isolation
 - o Eliminate whole food groups: meat, dairy, fats, wheat/gluten, etc.



ANOREXIA NERVOSA



ANOREXIA NERVOSA VS. PHYSICAL FITNESS



o Bulimia Nervosa (BN) – The following behaviors occur at least once per week over a 3-month period.

- Eating large amounts of food in a discrete time frame.
- A sense of lack of control over eating during episodes. Sometimes they “check out” and don’t remember all they ate.
- Recurrent inappropriate compensatory behaviors to prevent weight gain (purging). Patients with anorexia may also engage in these:
 - o Self-induced vomiting (this becomes involuntary over time).
 - o Abuse of laxatives, diuretics, diet pills, and/or drinking tea which promote a laxative effect, using enemas.
 - o Excessive exercise
 - o Excessive intake of coffee, diet soda, or smoking to blunt appetite. Use of energy drinks.
- Self-evaluation is unduly influenced by body shape/weight.
- These patients are often normal weight or overweight, so their EDO is less likely to be noticed/identified.



Binge-Eating Disorder (BED) - The following behaviors occur at least once per week over a 3-month period.

- Eating large amounts of food in a discrete time frame.
- A sense of lack of control over eating during episodes
- Associated with three or more of the following:
 - Eating more rapidly than normal
 - Eating until uncomfortably full
 - Eating large amounts of food while not physically hungry
 - Eating alone due to embarrassment
 - Feeling disgusted depressed, or guilty afterward.



FIVE COMMON PATHWAYS TO B.E.D.

1. Obesity → Dieting → Binge Eating
 2. Childhood Restriction → Secretive Eating → Binge Eating
 3. Dieting → Anorexia Nervosa → Binge Eating → Bulimia Nervosa
 4. Trauma → Loss of Control → Binge Eating
 5. Food Insecurity → Perceived Restriction → Binge Eating
- We need to get rid of dieting "rules" and help our patients include all foods without judgment.
 - There are phone apps that don't track calories. (Rise Up Recover for i phone only, and Recovery Record for i phone and android)
 - There are many resources available for mindful eating, including video clips on You Tube.

OSFED & UFED

Other Specified Feeding and Eating Disorders-(OSFED) (used to be ED-NOS) – this classification fits up to 30% of treatment-seeking patients

- Atypical anorexia nervosa (if the pt is not underwt)
- Sub-threshold bulimia nervosa
- Sub-threshold binge eating disorder
- Purging disorder
- Night eating syndrome

Unspecified Feeding or Eating Disorder (UFED)

- Reserved for people who don't fit into any of the 5 categories listed under OSFED, or for whom there is not enough info to make a specific OSFED dx
 - For example: A patient struggling with bingeing and purging but doesn't have the intense shape and weight concerns that are required for a dx of bulimia.
 - Most people will fit into one of the other categories.

THE REST OF THE DIAGNOSES...

Avoidant/Restrictive Food Intake Disorder (ARFID)

- A feeding disorder which include people (often children) who have nutritional deficiencies, poor growth, or low weight due to limited food intake.
- Food restriction can be due to sensory aversion, lack of interest in food, or feeding-related trauma.

Rumination Disorder

- Regurgitation of food for at least one month.
- Regurgitated food may be re-chewed, re-swallowed, or spit out. Not due to a medical condition.

Body Dysmorphic Disorder

- Preoccupation with one or more perceived defects or flaws in physical appearance that are not observable, or appear slight to others.

Pica

- Persistent eating of non-nutritive, non-food substances such as paper, soap, cloth, hair, string, wool, soil, chalk...

SOME THINGS TO CONSIDER ABOUT THE DSM-V

- It is an outdated model for diagnosing EDOs.
- Eating disorders don't fall neatly into these categories, and patients with the same disorder respond differently to treatment.
 - The underlying cause of the EDO needs to be ID'd to treat effectively.
- A patient can be engaging in a myriad of disordered eating behaviors that don't fit into the DSM-V criteria.
- **Just because DEBs don't fit into the DSM-V doesn't mean the patient doesn't have an EDO or DEB.**
- Some "healthy" eating styles can have elements of DEB
 - Vegetarianism, "clean eating," avoiding gluten or dairy (when there is no medical need), ketogenic diet, etc. can mean the patient is missing essential macro- or micronutrients.
- Getting rid of calories can be achieved by self-induced vomiting, **but that is not the only way to purge.**
 - Excessive exercise, chewing/spitting out food, abuse of laxatives and/or diuretics, insulin omission etc.

MEDICAL COMPLICATIONS OF ANOREXIA

Cardiovascular

- Bradycardia & hypotension
- Mitral valve prolapse
- Sudden death – arrhythmia
- Refeeding syndrome
- Echo changes, pericardial effusion

Endocrine & Metabolic

- Amenorrhea
- Unintended pregnancy & miscarriages
- Osteopenia/osteoporosis
- Thyroid abnormalities
- Hypercortisolemia
- Hypoglycemia
- Neurogenic diabetes insipidus
- Hypophosphatemia
- Hypomagnesemia & hypokalemia if purging
- Mildly elevated liver enzymes

MEDICAL COMPLICATIONS OF ANOREXIA (CONT.)

Gastrointestinal

- Constipation
- Refeeding pancreatitis
- Acute gastric dilatation
- Delayed gastric emptying
- Hepatitis
- Dysphagia
- SMA syndrome

Hematologic

- Pancytopenia
- Decreased sedimentation rate
- Leukopenia
- Anemia
- Thrombocytopenia

MEDICAL COMPLICATIONS OF ANOREXIA (CONT.)

Neurologic

- Cerebral atrophy

Pulmonary

- Aspiration pneumonia
- Respiratory failure
- Spontaneous pneumothorax
- Emphysema

Dermatological

- Dry skin
- Alopecia
- Lanugo hair
- Starvation-associated pruritis
- Acrocyanosis

MEDICAL COMPLICATIONS OF BULIMIA

Cardiovascular

- Arrhythmias
- Diet pill toxicity
- Emetine (ippecac) cardiomyopathy
- Palpitations

Endocrine and Metabolic

- Irregular menses
- Mineralocorticoid excess
- Hypokalemia
- Dehydration

MEDICAL COMPLICATIONS OF BULIMIA (CONT)

Gastrointestinal

- o Dental erosion/caries
- o Parotid gland swelling
- o Esophageal rupture
- o GERD
- o Constipation due to laxative abuse
- o Rectal prolapse
- o Mallory-Weiss tear

Pulmonary

- o Aspiration pneumonia
- o Pneumomediastinum

Metabolic Acidosis

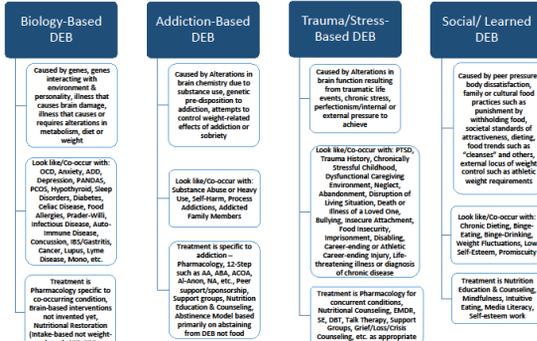
Pseudo Bartter's syndrome

MEDICAL COMPLICATIONS OF BED

- o Same complications as obesity
 - High blood pressure
 - High cholesterol levels
 - Heart disease as a result of elevated triglyceride levels
 - Type II diabetes mellitus
 - Obstructive sleep apnea
 - Edema
 - Kidney disease
 - Gall bladder disease
 - Degenerative Arthritis - caused by hormonal imbalances and vitamin deficiencies as well as increased stress on the joints
 - Infertility
 - Various forms of cancer
- o Increased rates of irritable bowel syndrome (IBS), fibromyalgia and insomnia have also been reported



Origins of Dysfunctional Eating Behavior (DEB) Model



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COMMON CO-MORBIDITIES OF EDOS

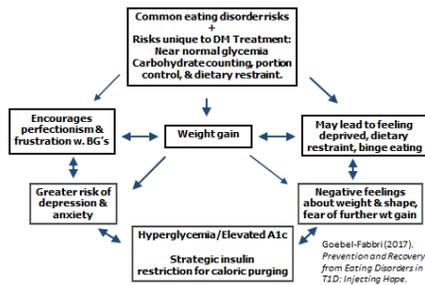
- OCD
- Anxiety Disorders
- Substance Abuse
- Bipolar Disorder
- Depression
- Personality Disorders
- PTSD
 - Trauma is subjective and depends on the patient's temperament.



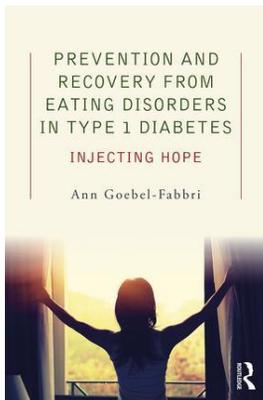
This is why there must be a mental health therapist and psychiatrist on the treatment team. EDOS are not necessarily about the food. DEBs are the chosen coping skill for the other issues. They may also need appropriate medication management to treat other symptoms and behaviors.



WHY/HOW DOES HAVING DM INCREASE RISK OF DEB



From Ann Goebel-Fabbri's Model of Eating Disorders in T1DM with Insulin Restriction



WHY/HOW DOES HAVING DM INCREASE RISK OF DEB?

- Often times the “perfect” BG control which is achieved by severe energy restriction masks the EDO until BMI is dangerously low.
 - We congratulate and reward these “perfect” patients, which reinforces their EDO behaviors.
- They look at foods as “good” or “bad.” Applying such a value then makes one a “good” or “bad DM patient/person.”
- Patients refer to “cheating” on their diet. They tell us, “You’re going to be mad at me because I’m not doing everything I know I should.”
 - We need to change the way we deliver our message to them.
- DM patients already feel imprisoned by their dx, have a low self-esteem, and are critical of their bodies.



WHY/HOW DOES HAVING DM INCREASE RISK OF DEB?

- You have to feed hypoglycemia.
- Low BG can lead to binge eating.
- New dx of T1DM presents with significant weight loss. Once BG is regulated, weight is restored (plus more). Patients think, “Insulin makes me fat.”
 - We need to prepare patients for the edema they will have with rehydration after DKA and tell them clothes, shoes, rings may not fit, and where on the body edema may settle.
 - Providers may consider prescribing a one-month supply of a low-dose diuretic (No refills!) to help patients tolerate this stage of treatment.
 - They need to be reassured this is not fat gain & it is temporary. (We cannot predict how long this retention lasts since it is individual for each patient.) Patients need to drink plenty of liquid and avoid caffeine.
 - We need to improve BG ranges slowly and cautiously to avoid treatment-induced complications.
- Patients need to be able to trust that members of their treatment team will validate their fears, educate without judgment, and take them seriously.



ANN GOEBEL-FABBRI, PHD RESEARCH

- The following are examples of what patients with T1DM who had also suffered from EDO but were now in recovery said about their DM care & education from doctors, nurses, dietitians, and CDEs.
- They shared what was helpful and what was harmful.
- Dr. Goebel-Fabbri refers to the findings of her research as “Learning From the Experts.”
- Recovery was defined as:
 - Consistently taking appropriate insulin doses
 - Not engaging in rigid dieting or over-exercising
 - Not intentionally running BGs high.
 - Eating flexibly most of the time
 - Not acting on EDO thoughts or feelings



WHAT TEACHING PRINCIPLES WERE HELPFUL OR HARMFUL IN PREVENTING DEB?

Be mindful when educating patients

"My doctor at the time told me, '...you need to understand that if you don't take insulin, you'll begin to lose weight like this.' And I said (to myself) am I going to gain weight back because I go on insulin?...I never had a normal relationship with insulin from the day I was diagnosed."

Decrease perfectionism and set realistic goals with the patient

"The constant message that I was getting was '...well you're not doing it right. You need to do this, you need to do that, you're not doing this...' I felt like that was my doctor's appointments...and at home it was kind of the same."



WHAT TEACHING PRINCIPLES WERE HELPFUL OR HARMFUL IN PREVENTING DEB?

Emphasize flexible eating

"Everything was counted. I remember it was 12 Cheez-Its or Goldfish for snack, and snack had to be at an exact time. I have a memory in pre-school where I would cheat. That was another big word: cheat, cheat, cheat."



Don't use fear tactics

"One of the women that was instructing me...gave me all this literature...'On average if you have diabetes, 15 years is going to be cut off your life.' Why would you give this literature to a 15 year old girl to have her read in her hospital bed? And I think that really stuck with me."



WHAT TEACHING PRINCIPLES WERE HELPFUL OR HARMFUL IN PREVENTING DEB?

Prepare patients and explain weight gain carefully

"If someone had said, 'Your body has torn itself down, you didn't really lose fat, you lost all your muscle, you're going to gain some weight back, but it's your body repairing.' It could have been different if it was presented to me like that."

Be careful of judgment and don't blame the patient

"I think a huge thing would actually be to have them explicitly say, 'High blood sugars happen, not bad blood sugars...It's going to happen to you no matter what you do'... and also keep the focus on feeling good, that you're going to feel better when your blood sugars are in a certain range, and 'We all want to keep you feeling good and feeling healthy.'"



WHAT THINGS WERE HELPFUL OR HARMFUL IN PROMPTING THE PATIENT TO GET HELP?



Poor health and profound fatigue
"I remember being in the subway in [name of city deleted] and going up 2 flights of stairs and thinking, 'Oh my gosh, I can't do this,' it was exhausting just to move my own body around."



Damage to relationships
"My husband was just like, 'I'm not raising my child with a person who's like this. All you do is sleep, you eat, and attempt to go to work... You already lost school, you'll lose everything to this.' And the end of our marriage was when I sought recovery. Because I just couldn't lose anything else."

WHAT THINGS WERE HELPFUL OR HARMFUL IN PROMPTING THE PATIENT TO GET HELP?

School and work performance

"I have an unfinished college degree...It's a burden financially, and professionally...to the outside world, I look like someone...who is just really scattered...and I've had to work really hard to forgive myself for that."

"I worked at a doctor's office and a doctor called me out and sent me to HR and said, 'She's so sick, she's sleeping in exam rooms on her hour break.' They had to have an intervention and give me short-term disability to go to treatment."



WHAT THINGS WERE HELPFUL OR HARMFUL IN PROMPTING THE PATIENT TO GET HELP?

Feeling frozen in time

"I'm also stunted...I was too sick in high school and most of college to even really think about dating...I didn't go away to college or live in a dorm...I grew up thinking that everyone got married by 25 and had their first baby at 26, just like my mom. I'm almost 30 and those things are far down the road for me, if ever."

Fear

"I could already foresee the future. I was like, 'I'm going to be 32 one day...and I'll want to have kids, but I'm not going to be able to have kids. I'm not going to have legs. I'll be blind because of what I'm doing right now.'"



WHAT WERE CHALLENGES TO EDO RECOVERY?

Fear of feelings

"I had no idea how to have feelings anymore...When I did have feelings I would binge and then get really high and pass out. So I didn't know how to feel jealous. I didn't know how to feel anxious. I didn't know how to feel sad...I had no tolerance."

Fear of fat (this refers to weight gain after DKA & profound dehydration).

"The weight gain...feeling like your skin is literally stretching to accommodate the water. I mean it's awful...Sitting in my closet...and nothing fit, closing myself in, and screaming my lungs out...Every woman who has a weight issue...its their worst nightmare."



WHAT WERE CHALLENGES TO EDO RECOVERY?

Finding the right treatment

"Figuring out what the heck kind of help I needed [was hard]...I want help, but I don't know where to go for help, you know?...Because you can't just Google diabulimia [therapists] to help you. There's nothing."

"Nobody understands type 1 diabetes...I tried person after person. I went to this big, huge eating disorder center nearby...I didn't fit their cookie cutter mold...they didn't know anything about how type 1 diabetes, and it just made me feel worse."

Please I need help!
Really
HELP!



THE IMPORTANCE OF APPROPRIATE EDO TREATMENT

Open communication among members of the treatment team

"I think having a comprehensive care team who could talk to each other was really important...Everyone sort of knew what was going on...I couldn't manipulate...Those sorts of things were really helpful."

The importance of "Diabetes Informed" Treatment

"Half of the experience...was that...I couldn't get away with anything because they knew absolutely everything...Having a critical mass of other people with the same illness...I feel like this eating disorder is particularly isolating, because people don't understand it. Talked with someone who understands exactly what you've gone through is...it was priceless."

Achieving small goals (!!!!)

"I wish that at times they realized...every single meal if you eat what you're supposed to eat and you give yourself your insulin, that's a mini triumph in itself. And then when you go to the next meal it gets a little easier and a little bit easier...and soon the little steps will turn into bigger steps because it gets easier."



THE IMPORTANCE OF APPROPRIATE EDO TREATMENT

The need for gradual improvements to avoid treatment-induced complications

"What I didn't realize then is that they were gradually bringing my blood sugar down over time, so that I would be safe...But as soon as I was left to my own devices, I would keep my blood sugar in the low 100's or under 100...That was a terrible idea, but I didn't know...Everything hurt. It wasn't just my legs, although that became the biggest long-term issue. But I felt like I had the flu...extreme muscle fatigue...here I was destroying myself...I finally go and get healthy, finally, and then my body is rebelling against me for doing the one thing that I hadn't been doing in the past."

What doctors need to understand

"I can be the smartest person around and still struggle with this, even if from the outside it seems like it should be so easy – just take shots, just test blood sugar...but it's not...and just telling me to take this shot and test this many times doesn't make it easy to do."

THE "GIFTS OF RECOVERY"

Better health and energy

"You don't know how tired you are until you're not that tired anymore."

"It has shown me how strong I am. This is the hardest thing I've ever done...it has made me healthier, stronger...I can feel tired at the end of the day, but it's what I call 'normal person' tired after a long day at work."



Friends and family

"I have an amazing family, I have a son...I have friends. I would never have those things. I would never be able to have a healthy pregnancy, ever...I thought I had harmed myself so badly, and I hadn't...I don't even know if I'd be alive if I hadn't recovered."



Healthy, functioning brains

"I was able to go back to college at the university I got suspended from, and graduated magna cum laude."



THE "GIFTS OF RECOVERY"

Personalities & hobbies

"I have a giant Scotch collection and 2 dogs. I go hiking on the weekends...I've been taking my time and figuring out what I like to do...It's a completely different process than when you really are firmly convinced you're not going to live past 30."



Changed relationship with food

"If I've wanted to eat something that's high in carbs, it's not going to ruin my day... I can still have a day and have a bagel."



Changed relationship with diabetes

"My relationship with diabetes has become much less resentful...I have definitely been more accepting of this as a part of my life and that some days are going to be better than other (blood sugar-wise), and that's okay because it's the nature of the beast."

NOURISHMENT = LIFE!



- o Eating is critical to life. Obvious to us, but not to them.
 - If a patient is unable to feed themselves appropriately, they need to get admitted ASAP to an in-patient treatment facility.
 - Any member of the treatment team, or the family can start the process of deciding on the treatment facility. This is often driven by the doctor.
- o Poor nutrition, inadequate kcal intake = poor cognition!
- o Poor nutrition = depression, fatigue, and in the T1DM pt, low BG.
- o Patients cannot effectively participate in therapy if they are starving.

They need to start eating!!!



HOW DO WE HELP THEM EAT AGAIN?



STRATEGIES TO IMPROVE NUTRITION STATUS OF EDO PATIENTS

Where to start:

- o Rule of 3's
 - 3 meals per day
 - Up to 3 snacks per day
 - Eat every 3-4 hours
 - o No closer than 1 ½ hours, no more than 4 hours
 - Eat 3 items
 - o 3 different food groups
 - I like to emphasize the macronutrients – protein, carb, and fat



THINGS TO REMEMBER WHEN REFEEDING

- Eating will be uncomfortable, even painful
 - Food will sit in there like a rock – slowed peristalsis and gut motility due to previous starvation and decreased BMR.
 - GI tract is not used to doing its job!
 - Not making normal amounts of digestive enzymes
 - Some people have success with digestive enzymes, probiotics to help improve sx's. (Not everyone).
 - Patients will have constipation
 - Avoid laxatives!!!
 - Can give Miralax without worry.
- There is no shortcut. Pt must put food in the stomach and allow the GI tract to start functioning again.
- This is a big trigger to restrict, purge, take laxatives!
 - NO! They cannot!!! The process will take longer!



IF THEY CANNOT FOLLOW THE RULE OF 3'S

- Compromise.
- Start in a place they are able, but they **MUST** eat.
 - Eat one thing every 2-3 hours.
 - Liquids and soft foods are sometimes better tolerated, & then help them advance their diet.
 - You will know they are eating when weight starts to trend upwards.
 - **Medical providers and RDs need to see these patients weekly. Therapist may see them 1-2x per week!**
 - There needs to be regular communication between **all** members of the treatment team!



OTHER THINGS TO CONSIDER

- Blind weights are advisable (pt steps on scale backward)
 - No discussion about the number.
 - No discussion about the trend up or down.
 - Discuss only a "healthy weight" and emphasize it is a range and not just one number.
- Remember that EDO patients have distorted thinking. (That cupcake will make me fat!)
 - Self-reporting may be distorted.
- To have weight recovery, the patient needs to eat.
 - May need a structured meal plan but be careful about the "numbers." Numbers are necessary, especially to assure appropriate intake. But meal plans can be perceived as a "diet."
 - Use food lists that do not have calories listed.
 - Exchange list is often used, but no kcals or fat grams.
 - Avoid saying "weight gain." Use the terminology "weight recovery" or "weight restoration."



SCREENING TOOLS

- o Diabetes and Eating Problem Survey (next slide)
- o 16 questions, 0-5 Likert scale, can complete in <10 minutes.

We need to ask our patients these types of questions. They may not tell us everything, but my experience is, if you ask in a matter-of-fact way, without any judgment or shock/surprise, **they will tell us enough**.

DIABETES AND EATING PROBLEM SURVEY (DEPS)

- o Respondents answer the following statements: (Circle Y or N)
 - o • Losing weight is an important goal to me
 - o • I skip meals and/or snacks
 - o • Other people have told me that my eating is out of control
 - o • When I overeat, I don't take enough insulin to cover the food
 - o • I eat more when I am alone than when I am with others
 - o • I feel that it's difficult to lose weight and control my diabetes at the same time
 - o • I avoid checking my blood sugar when I feel like it is out of range
 - o • I make myself vomit
 - o • I try to keep my blood sugar high so that I will lose weight
 - o • I try to eat to the point of spilling ketones in my urine
 - o • I feel fat when I take all of my insulin
 - o • Other people tell me to take better care of my diabetes
 - o • After I overeat, I skip my next insulin dose
 - o • I feel that my eating is out of control
 - o • I alternate between eating very little and eating huge amounts
 - o • I would rather be thin than to have good control of my diabetes
- o Items are answered on a 6-point Likert scale: 0=never; 1=rarely; 2=sometimes; 3=often; 4=usually; 5=always.
 o *From Markowitz et al (2010).

SCREENING TOOLS

SCOFF – ASKS ONLY 5 QUESTIONS – EASY!

These questions may be used to explore the possibility of whether someone might be experiencing an eating disorder. The tool is not intended for making a diagnosis, however highlights those who may require further investigation.

1. Do you ever make yourself **S**ick (vomit) because you feel uncomfortably full?
2. Do you worry you have lost **C**ontrol over how much you eat?
3. Have you recently lost more than **O**ne stone (approximately 13 lbs or 6 kg) in a three month period?
4. Do you believe yourself to be **E**at when others say you are too thin?
5. Would you say that **F**ood dominates your life?

Each positive response (yes) is given 1 point. A score of 2 or more indicates a possible eating disorder and warrants further exploration.

SCREENING TOOLS

EATING ATTITUDES TEST (EAT-26)

- o <http://www.eat-26.com/> (link to a website where you can take the test)
- o <http://santarosanutrition.com/files/Download/EAT26Test120105.pdf> (This is a PDF file of the test)
- o This tool has 26 questions and takes a long time to administer. It is not really useful for the CDE or medical provider.



APA PRACTICE GUIDELINES FOR THE TREATMENT OF EATING DISORDERS 2006

https://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/eatingdisorders.pdf



TREATMENT OF EATING DISORDERS

- o People who suffer from EDOs need to have a multidisciplinary treatment team.
 - Doctor
 - Dietitian
 - Therapist
 - Psychiatrist (who prescribes psych meds)



- o When a patient also has DM, **this team needs to include the endocrinologist and CDE.**
- o There needs to be open and regular communication between all members of the team.



TREATMENT FOR EDO AND DM

- If a patient needs to be admitted to an in-patient tx center or Intensive Out-Patient Program (IOP), they need a treatment program which knows how to treat DM as well as the EDO.
 - A treatment center which doesn't know how to deal with DM, (especially T1DM) can be more harmful to the patient.
 - The endocrinologist and CDE need to be an adjunct part of the treatment team if the program doesn't have credentialed DM professionals. Communication needs to be consistent throughout treatment.

Please refer to pages following the References for a list of Eating Disorder Treatment Centers with T1DM Specialty

A GOOD RESOURCE

NEDA: National Eating Disorders Association



National Eating Disorders Association

Parent Toolkit has some great information for everyone. <https://www.nationaleatingdisorders.org/parent-toolkit>

HERE IN THE TRI-CITIES AREA

The Recovery & Wellness Center of Eastern Washington The Tri-Cities' first Intensive Out-Patient Program (IOP) for eating disorder.

- Clients attend 3 hours 5 days per week.
- Therapy groups
- Nutrition education
- Eat dinner in a supportive, supervised setting.
- Anticipate starting a new partial hospitalization program (PHP) to start in May of this year.



NEUROLOGIC CONNECTIONS TO EDO

People with EDOs have problems with regulation of hunger and satiety due to malfunction of several key hormones and neurological processes.

- Let's talk about
 - Leptin
 - Ghrelin

The research in this field of study needs to continue!



LEPTIN



- A hormone produced by fat cells that signals satiety/fullness.
- As body fat stores decrease, leptin levels decrease.
- Lower leptin levels mean that it takes longer to feel full after eating. This helps the body guard against weight loss, and helps it to recover its original weight.
- This is why it can be difficult to lose weight in general.



RESEARCH BY MONTELEONE ET AL., 2000

- Leptin levels were measured in 67 women with EDO
 - 21 with anorexia
 - 32 with bulimia
 - 14 with binge eating disorder
- Leptin levels were significantly elevated in **binge eating disorder** compared to women without EDO
 - High levels of leptin are usually associated with lower levels of endocannabinoids (brain chemicals that regulate appetite).
 - Low levels of endocannabinoids should decrease hunger.
 - However, in people with BED, their high leptin levels are associated with high levels of endocannabinoids, which may lead to more binge eating.
- Leptin levels were significantly lower in women with **anorexia or bulimia**



STUDY BY FREDERICH ET AL. 2002

- Levels of leptin compared in women with AN to women with low body weight for reasons other than AN
 - Leptin levels were significantly higher in women with AN.
 - This could explain why people with AN are hyperactive and can starve themselves for long periods of time.
 - They experience hunger, but it is not as strong as it should be.



STUDY BY JIMERSON, ET AL., 2000

- In bulimia nervosa, leptin levels appeared lower than expected
 - Associated with more frequent episodes of binge eating.



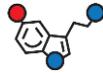
NOW FOR GHRELIN



- Ghrelin is produced in the stomach & acts opposite to Leptin.
 - High levels of leptin help to signal satiety.
 - High levels of ghrelin help to signal hunger.
 - The link between EDO and ghrelin is not quite as clear as leptin.
- In BED, levels of ghrelin are low, indicating that decisions to eat are often dictated by emotion.
 - Mental health therapy is needed!!!
- In bulimia, levels of ghrelin didn't decrease as much compared to control group, so they don't feel full after a meal.
 - More likely to binge after a meal as a result.
- In anorexia, ghrelin levels are elevated (Of course! They are starving!)
 - But during refeeding, ghrelin levels decrease significantly.
 - May be why people with AN have such difficulty gaining weight.



NOW LET'S TALK ABOUT NEUROTRANSMITTERS



o Serotonin

- Has role in memory & learning, sleep, mood, and appetite.
- It is produced from food, especially carbohydrate.
- People with AN have significantly lower levels of serotonin in cerebral spinal fluid than people who don't have EDO.
 - o The low serotonin was likely from starvation since it is synthesized from the foods we eat.
- Another study showed that after long-term recovery from AN, pts had significantly elevated levels of serotonin.
 - o Higher levels of serotonin = higher anxiety levels & obsessive behavior.
 - o The pt may actually have less anxiety by starving themselves, BUT the brain compensates by making more serotonin receptors. To feel better, they have to starve themselves even more.
 - o When they start refeeding process, serotonin levels spike
 - o Extreme anxiety & heightened emotions
 - o Recovery is difficult! These patients need support and a good treatment team!



SEROTONIN IN BULIMIA NERVOSA



- o In BN during long periods of time without eating, patients experience a more significant decrease in serotonin levels than women who didn't have EDO.
 - Leads to binge eating and higher level of irritability.
- o Women with bulimia who had an irregularity in the serotonin receptor tended to have more impulsive behaviors.
 - These serotonin abnormalities persisted after recovery, and were likely present before the EDO manifested.



SEROTONIN IN BED

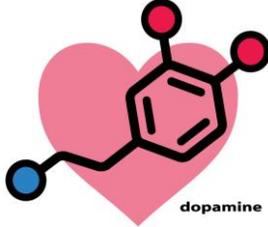
- o Chronically low levels of serotonin
 - Binge eating is thought to be an attempt to relieve the depressed mood caused by low serotonin levels.
- o Genetic studies found variants in a serotonin transporter gene associated with an increase in binge eating severity in the general population.



DOPAMINE



- The pleasure chemical.
- Helps to regulate movement, memory, sensory processing, and hormones & pregnancy.



EDOS AND DOPAMINE

- AN: There is possibly an over-production of dopamine.
 - Leads to anxiety, harm avoidance, hyperactivity and the ability to forgo pleasurable things (i.e. food).
- BN: Low levels of dopamine and receptors.
 - Binge-eating is associated with dopamine release in certain parts of the brain.
- BED: Link to hyper-responsiveness to rewards such as food.
 - Eating is more rewarding and pleasurable in this population and leads to a pattern of continual and compulsive overeating.



REFERENCES

Akkermann, K., et al. (2010). Serotonin transporter gene promoter polymorphism affects the severity of binge eating in general population. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 34(1), 111-114.

Bryden, K., et al. (1999). Eating habits, body weight, and insulin misuse: a longitudinal study of teenagers and young adults with type 1 diabetes. *Diabetes Care*, 22:1956-1960.

Cano, S., et al (2012). Role of ghrelin in pathophysiology of eating disorders. *CNS Drugs*, 26(4), 281-296.

Carson, R. (2017, January 31). Bringing Neuroscience Into the Therapy Session.

Diagnostic and statistical manual of mental disorders: DSM-5. (2013). Arlington, VA: American Psychiatric Association.

Frederich, R., Hu, S., Raymond, N., & Pomeroy, C. (2002). Leptin in anorexia nervosa and bulimia nervosa: Importance of assay technique and method of interpretation. *Journal of Laboratory and Clinical Medicine*, 139(2), 72-79.

Garner, D. et al. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine*, 12: 871-878.

Goebel-Fabbri, A., et al. (2017). *Prevention and Recovery From Eating Disorders in Type 1 Diabetes: Injecting Hope*. Routledge, New York.

Goebel-Fabbri, A., et al. (2002). Identification & Treatment of eating disorders in women with type 1 diabetes. *Treatments in Endocrinology*, 1 (3): 155-162.

EATING DISORDER TREATMENT CENTERS WITH T1DM SPECIALTY (CONT.)

Eating Recovery Center – Denver Location
7351 E. Lowry Blvd., Denver, CO 80230
Office: 877-711-1736

Website: www.eatingrecoverycenter.com

Treats male and female adults, adolescents, and children with a continuum of care including inpatient, residential, partial hospital and outpatient levels.

Hasbro Children's Hospital
593 Eddy St., Providence, RI 02903
Office: 401-444-4000

Website: www.hasbrochildrenshospital.org/inpatient-medical-psychiatric-program

Uses inpatient and partial hospital treatment for males and females from ages 6 to 18 years struggling with multiple different psychiatric disorders and chronic diseases – including eating disorders in T1DM.

Melrose Center
3525 Monterey Dr., St. Louis Park, MN 55416
Office: 952-993-6200

Website: www.parknicollet.com/SpecialtyCenters/Melrose-Center/Type:1-Diabetes

Partners with the International Diabetes Center within the same hospital system to coordinate care for the eating disorders and T1DM treatment track. Provides residential, partial, and outpatient treatment for eating disorders in children, adolescents, and adults.

EATING DISORDER TREATMENT CENTERS IN WASHINGTON STATE

(These programs do not have T1DM specialty – only Eating disorder treatment)

Tri-Cities

Recovery and Wellness Center of Eastern WA
1950 Keene Road, Bldg. G
Richland, WA 99352
Office: 509-619-0519

Website: <https://www.recoveryandwellness.org/>

Offers separate intensive out-patient program (IOP) for adolescent and adult females. Soon to offer partial hospitalization program (PHP) for eating disorder clients who need a higher level of care. Healthy teen program provides therapy groups for depression and anxiety for teens age 13-18 years

Spokane, Bellevue, Seattle

Emily Program
Center for Discovery
Eating Recovery Center
