DIABETES & EATING DISORDERS

NOT JUST "DIABULIMIA"

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CENTER FOR CHANGE
Specialized Treatment for Eating Disorders
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OVERVIEW: DIABETES + ED

- Eating disorders and Diabetes Statistics
- Medical concerns as they relate to case study examples:
  - 1) Anorexia nervosa + T1 Diabetes
  - 2) OSFED + T1 Diabetes
  - 3) Bulimia nervosa + T1 Diabetes
  - 4) Binge eating + T2 Diabetes
  - 5) ED-DMT1 "diabulimia"
- Treatment/recovery process
- Practical applications

EATING DISORDERS + DIABETES

- ED behaviors seen in 8% of T1DM vs 1% of peers without DM
- Increased risk of disturbed eating behavior in girls with T1DM as young as 9 yrs old.
- 32.4% of females with Type 1 diabetes have some form of disordered eating or weight control behavior
- 36% reported intentional omission of insulin.
- Strong association between Type 2 Diabetes and clinically significant Binge Eating.

Colton P et al, Eating disorders in girls and women with type 1 diabetes: A longitudinal sutdy of prevalence, onset, remission and recurrence. Diabetes Care 38:1212-1217, July 2015
Peveler RC. Type 1 Diabetes & Eating Disorders, Diabetes Care 2005
Colton P, et al. Disturbed eating behavior and eating disorders in preteen and early teenage girls with type 1 diabetes: a case-controlled study
Diabetes Care 27:1654-1659, 2004
Udo et al. Menopause and metabolic syndrome in obese individulas with binge eating disorder. Eat Behav 2014;15

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WHY ED AND DIABETES?

- Emphasis on food and dietary restraint
- Weight gain/higher BMI, result from intensive insulin therapy
- Temptation factor -Easy availability of deliberate insulin omission to control weight
- Effect of diabetes on self-concept, body image, and family interactions
- Family dynamics involving autonomy and independence concerning diabetes self-management
- Type 2 diabetes: Prevalence rate among Binge Eating Disorder with obesity 3.3-5.5%

Diabetes Spectrum volume 22, Number 3,138-141,160, 2009
Mitchell, J. Medical comorbidity and medical complications associated with Binge-eating disorder. Int J Eat Dis 49:3

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MEDICAL COMPLICATIONS

- Long list of medical problems associated with eating disorders
- Most are reversible and treatable
- Some are associated with permanent harm
- In anorexia and ARFID a direct result of starvation and weight loss
- In bulimia directly correlated with mode and frequency of purging

Mehler, Phillip (2010) Eating Disorders a guide to medical care and complications

MEDICAL COMPLICATIONS OF ANOREXIA

❖**Cardiovascular**
- Bradycardia & hypotension
- Mitral valve prolapse
- Sudden death - arrhythmia
- Refeeding syndrome
- Echo changes Pericardial effusions

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

❖**Endocrine and Metabolic**
- Amenorrhea
- Unintended pregnancy & miscarriages
- Osteoporosis
- Thyroid Abnormalities
- Hypercortisolemia
- Hypoglycemia
- Neurogenic diabetes insipidus
- Hypophosphatemia

Medical complications of Anorexia Nervosa and Bulimia – Tour De Force.
Philip Mehler, MD.
ACUTE annual symposium 2017

MEDICAL COMPLICATIONS OF ANOREXIA CONT.

❖ **Hematologic**
- Pancytopenia
- Decreased sedimentation rate

❖ **Neurologic**
- Cerebral atrophy

❖ **Ophthalmic**
- Lagopthalmos

❖ **Auditory**
- Patulous
- Eustachian tube dysfunction

❖ **Pulmonary**
- Aspiration pneumonia
- Respiratory failure
- Spontaneous pneumothorax Emphysema

❖ **Dermatologic**
- Dry skin
- Alopecia
- Lanugo hair
- Starvation- associated puritis
- Acrocyanosis

MEDICAL COMPLICATIONS OF BULIMIA

❖ **Cardiovascular**
- Arrhythmias
- Diet pill toxicity
- Emitene cardiomyopathy
- Palpitations

❖ **Gastrointestinal**
- Dental erosion and caries
- Parotid gland swelling
- Esophageal rupture
- Gastroesophageal reflux (GERD)
- Constipation due to laxative abuse
- Constipation due to laxative abuse
- Rectal prolapse
- Mallory-Weiss tear

❖ **Endocrine and Metabolic**
- Irregular menses
- Mineralocorticoid excess
- Diabulimia
- Hypokalemia
- Dehydration

Medical complications of Anorexia Nervosa and Bulimia – Tour De Force. Philip Mehler, MD. ACUTE annual symposium 2017

MEDICAL COMPLICATIONS OF BULIMIA CONT.

❖ **Endocrine & Metabolic**
- Irregular menses
- Mineralocorticoid excess
- "Diabulimia"
- Hypokalemia
- Dehydration

❖ **Ophthalmic**
- Scleral hemorrhage

❖ **Pulmonary**
- Aspiration pneumonia
- Pneumomediastinum

❖ **ENT**
- Epistaxis
- Pharyngitis

❖ **Dermatologic**
- Russel's sign
- Edema

❖ **Metabolic Acidosis**
- Pseudo Bartter's syndrome

ED SCREENING TOOLS FOR DIABETES PATIENTS

- Diabetes and Eating Problem Survey – Revised (DEPS-R)
- SCOFF
- Eating Attitudes Test (EAT-26)

DEPS-R

16 questions 0-5 Likert scale, can complete in <10 min

Some examples of questions specifically related to diabetes:

- I feel fat when I take all of my insulin.
- Other people tell me to take better care of my diabetes.
- After I overeat, I skip my next insulin dose.
- I keep my blood sugar high in order to loose weight.

Markowitz, J., Butler, D., Volkening, L., Antisdel, J., Anderson, B., Laffel, L., Brief screening tool for disordered eating in diabetes. Diabetes Care, vol. 33, number 3, MARCH 2010

SCOFF

- Do you make yourself **S**ick because you feel uncomfortably full?
- Do you worry you have lost **C**ontrol over how much you eat?
- Have you recently lost more than **O**ne stone (7.7 kg, about 15 lbs) in a 3 month period?
- Do you believe yourself to be **F**at when others say you are too thin?
- Would you say that **F**ood dominates your life?

*One point for every "yes;" a score of ≥2 indicates a likely case of anorexia nervosa or bulimia

EATING ATTITUDES TEST (EAT-26)

Part B: Please check a response for each of the following statements:
1. Am terrified about being overweight.
2. Avoid eating when I am hungry.
3. Find myself preoccupied with food.
4. Have gone on eating binges where I feel that I may not be able to stop.
5. Cut my food into small pieces.
6. Aware of the calorie content of foods that I eat.
7. Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.
8. Feel that others would prefer if I ate more.
9. Vomit after I have eaten.
10. Feel extremely guilty after eating.
11. Am preoccupied with a desire to be thinner.

ANOREXIA NERVOSA + DM
RESTRICTING TYPE WITH EXCESSIVE EXERCISE

- 46 yo female
- HT: 5 ft. 8 in.
- WT: 129
- BMI 19.6 IBW 92%
- Type 1 Diabetes x 44 years - "brittle"
  - "always worked out"
  - "always cognizant of what I'm eating"

ED SCREENING TOOLS FOR DIABETES PATIENTS

- DEPS-R = score 16
  - Diabetes and Eating Problem Survey- Revised (score >20 clinically significant)
- SCOFF = 2 (yes)

CO-EXISTING CONDITIONS

- Major Depressive Disorder
- Generalized Anxiety Disorder
- Obsessive Compulsive Disorder

- Crest syndrome/ scleroderma
- Colitis, autoimmune
- Hypothyroidism
- hypothalamic amenorrhea

MEDICATIONS

- Insulin, Novolog, insulin pump
- Synthroid .88 mg
- Simvastatin 20 mg
- Accupril 30mg
- Cymbalta 90mg
- Remeron 45mg
- Clonidine .2mg
- Deplin 30 mg
- Lo-loestrin
- Iron

VITAL SIGNS

- BP 166/80, 150/82
- HR 73, 77
- T 98.5

- EKG - normal sinus HR 63
  Qt/Qtc 418/423

LABS

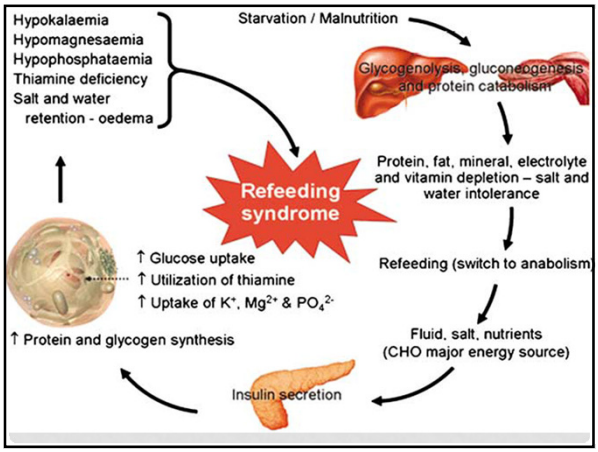
- A1C 6.5%

- Glucose 55
- Potassium 3.5
- ALKP 39
- RBC 3.6
- HGB 11.8
- HCT 34.1

REFEEDING SYNDROME

- first observed and described after World War II when victims of starvation were noted to experience cardiac or neurologic dysfunction or both after being reintroduced to food.
- Electrolyte disturbances (primarily decreased levels of phosphorus, magnesium, or potassium) occur immediately upon the rapid initiation of refeeding—commonly within 12 or 72 hours—and can continue for the next 2 to 7 days.
- Cardiac complications can develop within the first week, often within the first 24 to 48 hours.[3]

Yantis M, Velander R. How to recognize and respond to refeeding syndrome. Nursing 2008; 38(S):34-39



CRITERIA FROM THE GUIDELINES OF THE NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE FOR IDENTIFYING PATIENTS AT HIGH RISK OF REFEEDING PROBLEMS

- **the patient has one or more of the following**:
  - Body mass index (kg/m²) <16
  - weight loss >15% in the past three to six months
  - Little or no nutritional intake for >10 days
  - Low levels of potassium, phosphate, or magnesium before feeding
- **Or the patient has two or more of the following:**
  - Body mass index <18.5
  - weight loss >10% in the past three to six months
  - Little or no nutritional intake for >5 days
  - History of alcohol misuse or drugs, **including insulin**, chemotherapy, antacids, or diuretics

HOW TO AVOID RE-FEEDING SYNDROME?

- Recognize the "patient at risk"
- Carefully test for and correct electrolyte abnormalities **before** initiating **any** nutritional support.
- Judiciously restore circulatory volume, closely monitor vitals and exam, Never administer rapid IV fluids
- Increase caloric delivery slowly
- Carefully monitor the electrolytes especially over the 1st week
  - including: Phosphorous, Potassium and Magnesium

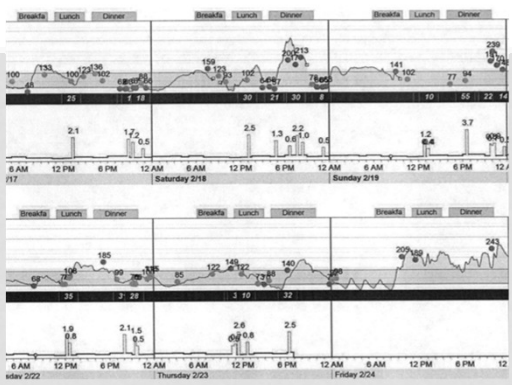
POTENTIAL COMPLICATIONS AND TREATMENT

- Electrolyte abnormalities
  - Blood chemistry daily or every other day until stable, replace low
- Fluid shift
- Edema
  - Lung and edema checks, compression hoes, elevate feet, medication
- Vital sign changes (HR)
  - Monitor vital signs daily
- Sluggish GI tract
  - Dietary low and slow(not as low as before)
  - fiber and hydration

HYPOGLYCEMIA IN ANOREXIA

- Dietary restriction accompanied by weight loss and excessive exercise lead to depleted hepatic glycogen reserves and disruption of gluconeogenesis substrates and abnormalities of glucose metabolism.
- Milder cases of anorexia hypoglycemia rarely causes symptoms.
- "documented hypoglycemia should simply imply an urgent need for weight restoration."

HYPOGLYCEMIA



PERFECTIONISM

12 AM - 6 AM			6 AM - 9 AM			9 AM - 11 AM			11 AM - 2 PM			2 PM - 5 PM			5 PM - 7 PM			7 PM - 10 PM			10 PM	
luc.	Med.	CHO	Gluc.	Med.	CHO	Gluc.	Med.	CHO	Gluc.	Med.	CHO	Gluc.	Med.	CHO	Gluc.	Med.	CHO	Gluc.	Med.	CHO	Gluc.	M
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DIABETES ALIBI

- Restriction
  - high blood sugar
  - "Someone with diabetes shouldn't eat that"
    - Limited carbohydrates
    - No desserts
- Binge eating
  - Triggered by low blood sugar

AFTER 6 WEEKS

- Eating Disorder thoughts decreased from 80% to 20%
- A1c 6.7% (6.5 on admit)
  - Minimal hypoglycemia

OSFED + DM

- 19 yo female
- returned from serving a volunteer mission because of ED behaviors and wt loss
- Some orthorexia type behaviors -"Fixation on righteous eating".
- Restriction and avoiding carbs
- Type 1 Diabetes x 7 yrs.
  - Insulin pump + CGM

OSFED + DM

- Ht: 65.5
- WT: 114
- BMI: 18.8
- LMP: months ago
- DEPS-R = 31
- SCOFF = 3

MEDICATIONS

- Prozac - OCD
- Risperdol – thought disorder
- Vitamin D
- Insulin – insulin pump + CGM

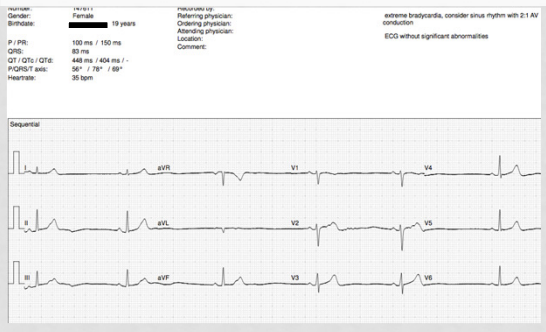
LABS

- A1c 7.1%
- Glucose 237
- Phosphate 4.8
- Sodium 145
- K+ 5.2
- RBC 3.9
- HDL cholesterol 65

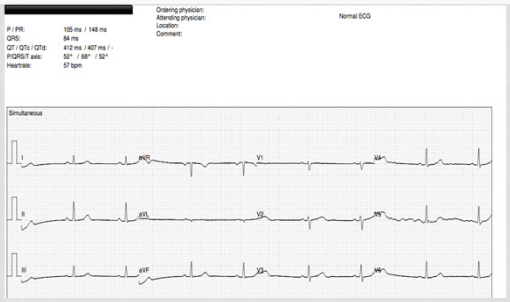
VITAL SIGNS

- BP: 96/56
- HR: 41
- T: 97.7
- EKG
  - HR 36
  - QT/QTC 454/412
  - While sleeping her heart rate dropped to 28

BRADYCARDIA



BRADYCARDIA



AFTER 4 MONTHS

- Eating Disorder thoughts decreased from 90% to 60%
- A1c = 7% (7.1% on admit)
- Vital signs stable
- Menses returned
- Intuitive Eating

BULIMIA NERVOSA + DM

- 30 yo female who is a medical professional
- HT: 5 ft. 2 in.
- WT: 174
- BMI 32.4
- Type 1 Diabetes x 23 years, insulin pump + CGM
  - A1c = 5.8%
  - ED thoughts 100% of the time

CO-EXISTING CONDITIONS

- Anxiety
- Depression – post partum exacerbation
- Self –harm
  - More common with diabetes?
  - Suicide ideation

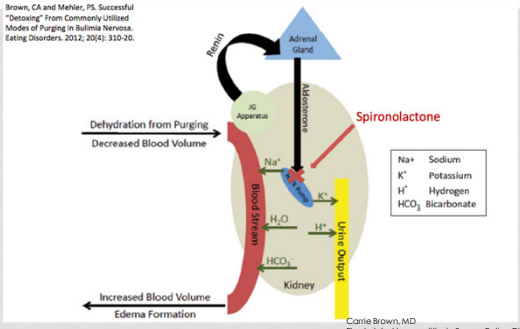
MEDICATIONS

- Abilify – depression
- Vistaril – anxiety
- Klonopin prn – panick attacks
- Ambien q HS for insomnia
- Lisinopril 10 mg "kidney protection"
- Synthroid 150 mcg po q day for hypothyroidism
- HCTZ 25 mg po q am – blood pressure?
- Humalog insulin via pump

LABS

- Sodium 127 (135-143)
- Chloride 97 (99-110)
- CO2 18
- Glucose 325
- TSH 0.05 (4 weeks later =.98)
- Vitamin D 27

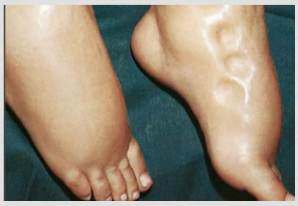
PSEUDO-BARTTER'S SYNDROME/ SECONDARY HYPERALDOSTERONISM



Carrie Brown, MD
Electrolyte Abnormalities in Severe Eating Disorders. ACUTE annual symposium 2017.

COMPLICATIONS OF PSEUDO-BARTTER'S

❖ **EDEMA PREVENTION**
- Spironolactone



AFTER 3 MONTHS OF TREATMENT

- Eating disorder thoughts decreased from 100% to 30%
- A1c 6.2% (was 5.8%)
- Left treatment being motivated to want to expand her family and be a healthy mom.

BINGE EATING + TYPE 2 DIABETES

- 40 yr old female with Binge Eating Disorder
- Military professional
- Was having a difficult time managing diabetes because of eating disorder.
- ED thoughts 90%
- Comparing food. Wants to eat food that other pt's leave behind. "licking lids" "licking plate clean", "eats fast", abusing condiments - eating ketchup out of packages, butter tabs

VITAL SIGNS/LABS

- BP 131/73
- HR 106
- WT 246 lbs.
- BMI 39.5

- A1c 8.6%
- ALT 132
- AST 76
- Triglycerides 263
- VLDL 53

MEDICATIONS

- Gabapentin – neuropathy
- Lisinopril – hypertension
- Simvistatin – hypercholesterolemia
- Metformin – diabetes
- Lantus/novolog insulin – diabetes
- Abilify – thought disorder
- Fluoxetine – depression
- Hydroxyzine – anxiety/insomnia prn

SCREENING TOOLS
BINGE EATING + TYPE 2 DIABETES

- DEPS-R = 39
- SCOFF score = 3

AFTER 3 MONTHS OF TREATMENT

- A1c = 7.2%
- Liver enzymes WNL
- WT = 237 (lost 9 lbs.)
- ED thoughts improved from 90% to 30% of the time.
- "I actually left some food on my plate because I was full !"

RECOVERY DIRECTED EATING

Highly Structured Eating	Self Plating/Family Style Eating	Intuitive Eating
◊ RD determines appropriate calorie level	◊ RD teaches meal guidelines	◊ Client listens to and learns to honor hunger/satiety cues
◊ RD determines necessity of weight restoration	◊ CFC uses plate method– i.e. entrée/side dishes	◊ Client learns to eat appropriately when cues may or may not be present
◊ Eat designated meal plan or drink equivalent Boost replacement	◊ Client chooses side options	
	◊ Later client chooses among entrée options—learning to honor craving/preference	
	◊ Eat or drink Boost replacement	

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RECOVERY DIRECTED EATING

What the Client Learns

Highly Structured Eating	Self Plating/Family Style Eating	Intuitive Eating
◊ Trust the dietitian	◊ Take increased control	◊ Trust hunger/satiety cues
◊ Challenge the ED rules/beliefs about food	◊ Learn to challenge increasing ED voice	◊ Honor cues
◊ Brain and body are renourished & healed	◊ Learn the amount of food it takes to maintain weight	◊ Challenge ED increased urges to restrict
	◊ Increase variety/moderation	◊ Learn how emotions affect hunger/satiety cues
	◊ Determine emotional vs physical hunger	

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RECOVERY DIRECTED EATING

Timing of Teaching Intuitive Eating Principles

Highly Structured Eating	Self Plating/Family Style Eating	Intuitive Eating
◊ Reject the diet mentality		◊ Honor your hunger
◊ Make peace with food		
◊ Challenge the food police		
	◊ Discover the satisfaction factor	
	◊ Respect your fullness	
	◊ Honor your feelings without using food (or restricting food)	
◊ Respect your body		◊ Honor your health with gentle nutrition

DIETARY GOALS WITH ED + DIABETES

- Start highly structured and then loosen as glucose is managed and ED urges improve
- Teach Balance
  - DM needs vigilance, label reading, CHO counting
  - ED recovery needs flexibility
- Emphasize Flexibility
  - ED recovery needs variety and challenge to fear foods
  - DM can tolerate carb changes if worked into meal plan or covered by Insulin

EXERCISE VS INTUITIVE MOVEMENT

- Exercise as a purging method
- When exercise becomes an unhealthy coping mechanism
- Exercise addiction
- Intuitive/Harmonious movement
- Contracts for Exercise
  - Pre-exercise snack
  - Post-exercise snack
  - Moderate intensity and duration

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ED-DMT1 "DIABULIMIA"

- 15 yr old, high school student in AP and honors classes
- Diagnosed with diabetes at 4 years old.
- ED behaviors started at 12 years old with dieting and restricting calories. Started using some diet pills and or laxatives a few times/week. Usually binged after school, but would not take insulin for food eaten.
- Insulin omission:
  - Humalog was taking 1-2 times daily
  - Lantus was taking 36 units daily about 3 times per week

ED-DMT1 "DIABULIMIA"

- DEPS-R score = 69
- ED thoughts 50% of the time

VITAL SIGNS

- WT: 114
- BMI: 20.5
- BP: 109/71
- HR: 110
- EKG: WNL

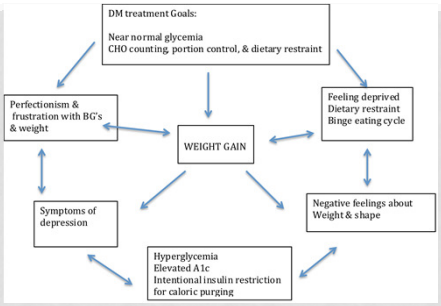
MEDICATIONS

- Prozac 20 mg po q day for depression
- Gabapentin 100mg BID for anxiety
- Humalog insulin
- Lantus insulin

LABS

- A1c 11.7%
- Glucose 419
- Co2 15
- Sodium 134
- AST 88, ALT 66
- Potassium 3.4
- Vitamin D 9.4

EATING DISORDERS AND DIABETES MODEL



Goebel-Fabbri, A. et al, Identification and treatment of eating disorders in women with type 1 diabetes mellitus, *Treatments in Endocrinology*, 1(3):155-62, 2002

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AFTER 2.5 MONTHS

Labs:

- AST 25 (6-37)
- ALT 39 (12-65)
- Vitamin D 38.7 (30 - 149)
- A1c 9.7% (11.7% on admit)

- ED thoughts reduced from 50 to 25% of the time

FOR FAMILY AND FRIENDS
PRACTICAL APPLICATIONS

- Know warning signs of ED and symptoms of DKA
- Refrain from fear tactics or shaming
- End "body talk"
- Encourage flexible eating

Ann Goebel-Fabbri (2017) Injecting Hope
Prevention and recovery from eating disorders in diabetes

FOR MENTAL HEALTH PROVIDERS

PRACTICAL APPLICATIONS

- Understand and "speak diabetes"
  - What it is and how it is currently treated, insulin types, pumps, CGMs
  - Know s/s of low and high BG
  - Understand risks of insulin restriction and signs of DKA
  - Be willing to learn
- Collaborate with diabetes team – they can teach you
- Gather diabetes history
  - Diagnosis, family's response, relationship with providers
  - Expectations, targets for glucose and approach to food.
- Adapt your standard approach to eating disorders
  - Diabetes specific concerns need to be integrated into treatment
  - Perfectionism : diabetes management , food, weight
- Comfort level - burnout

DIABETES PROVIDERS

PRACTICAL APPLICATIONS

- Create a nonjudgmental treatment relationship.
- Language:
  - Management vs. control
  - check/value vs. test (glucose or A1c)
    - Like a compass not a report card
  - High/low or in target vs. good/bad
  - Avoid labeling food as good or bad
  - Avoid suggestions or comments that diminish the complexity and difficulty of having both DM and ED
    - "just eat"
    - "Just take your insulin"
  - Avoid labels "non-compliant"

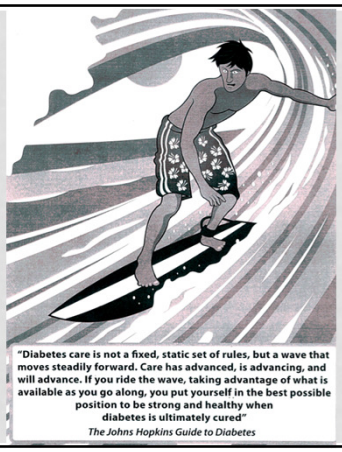
Ann Goebel-Fabbri 2017 Injecting Hope
Prevention and Recovery from Eating Disorders in Type 1 Diabetes

DIABETES PROVIDERS

PRACTICAL APPLICATIONS

- Teach symptoms of DKA
- Take the fear of weight gain seriously
- Help cope with edema
- Gradual decreases in A1c
- Focus on where the pt. feels ready
  - Celebrate small successes

Ann Goebel-Fabbri 2017 Injecting Hope
Prevention and Recovery from Eating Disorders in Type 1 Diabetes



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