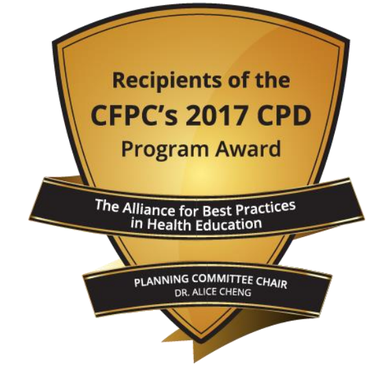
DIABETES IN DISTINCT POPULATIONS 2.0

A MULTIFACETED CHALLENGE



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CFPC'S 2017 CPD PROGRAM AWARD

Honours

The Alliance for Best Practices in Health Education
&
Diabetes in Distinct Populations 2.0 Program
(Planning Committee and Chair Dr. Alice Cheng)

As a recipient of the

2017 College of Family Physicians of Canada Continuing Professional Development Program Award

For an outstanding design, development and implementation of Mainpro+® certified educational program that has provided an exceptional learning experience to practising or practice-eligible CFPC members.

AUTHORS OF EACH MODULE

Modules	Authors
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Diabetes in Aboriginal Populations	Dr. Vincent Woo, Dr. Daniel Ngui
Eating Disorders in Diabetes	Dr. Barry Simon, Dr. Pierre Filteau
Fasting with Diabetes	Dr. Harpreet Bajaj, Dr. Pierre Filteau
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Complex Patients: Therapies that Can Reduce Mortality	Dr. David Cherney, Dr. Peter Lin
Insulin section	
Diabetes Management in the Presence of Glucocorticoids	Dr. Alice Cheng, Sarah Moore
Early Use of Insulin Therapy in T2D	Dr. Ravi Retnakaran, Dr. Daniel Ngui
Effects of Exercise & Hormones on Blood Glucose	Dr. Michael Riddell, Christine Opsteen
Shift Work, Driving Guidelines and Travel/Time Zone Management	Dr. Lenley Adams, Barbara Cleave

DISCLOSURE OF COMMERCIAL SUPPORT

This program has received:

- Financial support from the Boehringer Ingelheim/Eli Lilly Alliance in Diabetes in the form of an educational grant
- In-kind support from the Boehringer Ingelheim/Eli Lilly Canada Alliance in Diabetes in the form of logistical support

Potential for conflict of interest:

- The planning committee members have received honoraria from the Boehringer Ingelheim/Eli Lilly Alliance in Diabetes whose product may be discussed during the presentation.
  - Eli Lilly Canada Inc. benefits from the sale of the following products that may be discussed in this program
    - Dulaglutide; empagliflozin; glargine; glucagon; insulin lispro; insulin lispro injection/insulin lispro protamine suspension; insulin, biosynthetic human, NPH, regular insulin; linagliptin; linagliptin/metformin
  - Boehringer Ingelheim Canada Ltd. benefits from the sale of the following products that may be discussed in this program
    - Empagliflozin; glargine; linagliptin; linagliptin/metformin

DISCLOSURE OF COMMERCIAL SUPPORT

Mitigation Potential bias:

- The Alliance for Best Practice in Health Education (ABPHE) is a not-for-profit physician organization who received an educational grant to develop this program. The ABPHE engaged the organizing committee and participated in the content and format of this program.
- The steering committee was solely and fully responsible for developing all content and was involved at all stages of CME development to achieve scientific integrity, objectivity and balance.
- Boehringer Ingelheim/Eli Lilly provided funding for the content development and this CME event but were not involved in any aspect of the program development process.
- While I have received an honorarium from the Boehringer Ingelheim/Eli Lilly Alliance in Diabetes, and may discuss products from both companies, the information presented provides an unbiased overview of all products related to treating patients.

LEARNING OBJECTIVES

At the end of this session, participants will be able to:

- Identify and address unique issues surrounding the management of glycemia in distinct populations
- Recognize challenges to overall diabetes management in these populations
- Utilize appropriate strategies and resources to address challenges in these populations

HOME MENU

PLEASE MAKE A SELECTION

MODULES

1. CKD and Diabetes Update
2. Diabetes in Aboriginal Populations
3. Eating Disorders in Diabetes
4. Fasting with Diabetes
5. Foot Care in Persons with Diabetes
6. Hyperglycemic Emergencies and Sick Day Management
7. Mental Health and Diabetes
8. Complex Patients: Therapies that Can Reduce Mortality
9. Diabetes Management in the Presence of Glucocorticoids
10. Early Use of Insulin Therapy in T2D
11. Effects of Exercise & Hormones on Blood Glucose
12. Shift Work, Driving Guidelines and Travel/Time Zone Management

INSULIN SECTION MODULES

VIEW INSULIN INTRODUCTION

BACK TO MAIN MENU

Eating Disorders in Diabetes

Barry Simon MD, FRCPC
Pierre Filteau MD, CFCP

FACULTY/PRESENTER DISCLOSURE

- **Faculty/Presenter: Barry Simon MD, FRCPC**

- **Relationships with commercial interests:**
  - *I have received honoraria from Boehringer Ingelheim, Eli Lily, Alliance in Diabetes, and Shire*

DISCLOSURE OF FINANCIAL SUPPORT

- **This program has received:**
  - Financial support from Abbott Diabetes Care, NovoNordisk and Boehringer Ingelheim in the form of an educational grant
  - I am receiving an honorarium from Langs
- **Potential for conflict of interest:**
  - Products will be discussed during the presentation.
  - The information presented provides an unbiased overview of all products related to treating patients.

MITIGATING POTENTIAL BIAS

- Includes evidence based information related to eating disorder management but is not influenced by the sponsoring organizations

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

1. Describe the diagnostic criteria for eating disorders
2. Recognize the common presentation of eating disorders in Type 1 diabetes and Type 2 diabetes
3. Utilize strategies in the office to identify eating disorders
4. Describe basic interventions and resources

Which eating disorders are of particular concern in diabetes?

EATING DISORDERS IN DIABETES

Type 1 diabetes

Anorexia nervosa

Insulin restriction as a purge (“diabulimia”)

Type 2 diabetes

Bulimia nervosa

Binge eating disorders

ANOREXIA NERVOSA: DSM-V CRITERIA

A. A **refusal to maintain body weight** at or above a minimally normal weight for age and height (e.g. weight loss leading to a maintenance of body weight less than 85% of that expected).

B. Intense **fear of gaining weight** or becoming fat, even though underweight.

C. Disturbance in the way in **which one's body weight or shape is experienced**, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.

Types:

- Restricting: not regularly engaged in binge-eating or purging behaviour
- Binge-Eating/Purging: regularly engaged in binge-eating or purging behaviour (i.e., self-induced vomiting or the misuse of laxatives, diuretics or enemas).

American Psychiatric Association. *Diagnostic and statistical manual of mental disorders.* 5th ed. Arlington, VA: American Psychiatric Association; 2013

BULIMIA NERVOSA: DSM-V CRITERIA

A. **Recurrent** episodes of **binge eating** characterized by both of the following:

1. Eating, in a **discrete period of time** (e.g. within any 2 hour period), an amount of food that is definitely **larger than most** people would eat
2. A sense of **lack of control over eating** during the episode (e.g. a feeling that one cannot stop eating or control what or how much one is eating)

B. **Recurrent inappropriate compensatory behaviour** in order to prevent weight gain (e.g. self-induced vomiting; misuse of laxatives, diuretics, enemas or other medications, fasting, or excessive exercise)

C. The binge eating and inappropriate compensatory behaviours both occur, on average, **at least once a week for 3 months**

D. Self-evaluation is unduly influenced by body shape and weight

E. The disturbance does not occur exclusively during episodes of anorexia nervosa (AN)

American Psychiatric Association. *Diagnostic and statistical manual of mental disorders.* 5th ed. Arlington, VA: American Psychiatric Association; 2013

BULIMIA NERVOSA: DSM-V CRITERIA

Types

- **Purging**: During the current episode of Bulimia Nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics or enemas.
- **Non-purging**: During the current episode of Bulimia Nervosa, the person has used other inappropriate compensatory behaviours, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics or enemas.

BINGE EATING DISORDER- DSM-V CRITERIA

A. Recurrent episodes of **binge eating**
   1. Eating in a discrete period of time an amount of food that is **twice** the size of a normal meal.
   2. A sense of **lack of control**

B. The binge-eating episodes are associated with **≥3** of the following:
   1. Eating much more **rapidly** than usual
   2. Eating until feeling **uncomfortably full**
   3. Eating large amounts of food when **not feeling physically hungry**
   4. **Eating alone** because of **shame**
   5. Feeling **disgusted, guilty or depressed** after eating

C. Marked **distress** regarding binge eating is present

D. Binge eating occurs, on average, **at least one day a week for three months**

E. The binge eating is **not associated with regular use of inappropriate compensatory behaviors** and does not occur exclusively during the course of bulimia nervosa or anorexia nervosa

American Psychiatric Association. *Diagnostic and statistical manual of mental disorders.* 5th ed. Arlington, VA: American Psychiatric Association; 2013

AT-RISK PATIENTS

- Industrialized and western societies
- Females (female to male ratio is 10:1)
- Pattern of rigid dieting
- Certain hobbies & professions (e.g. gymnastics)
- Puberty
  - Diagnostic peak for both T1DM and eating disorders
- T1DM (anorexia nervosa)
- T2DM (binge eating disorders)

T1DM: Type 1 diabetes mellitus; T2DM: Type 2 diabetes mellitus

Essential Psychiatry. 4th Edition, Murray RM, Kendler KS, et al. (Eds) Cambridge: University Press, 2008

Eating Disorders and Type 1 Diabetes

Young adults at high risk of morbidity and mortality

A 21-YEAR-OLD WOMAN

- **Profile:**
  - A 21-year-old woman
  - Diagnosed with T1DM 9 months ago when she presented with diabetic ketoacidosis
  - Did not bring her logbook or meter to the visit
- **PMH:**
  - Depression as a teenager
- **Medications:**
  - Lispro 1U : 15g CHO; glargine 15 units qhs
- **FHx:**
  - Depression, anxiety
- **Physical exam:**
  - Weight 75 kg, BMI 24 kg/m^2, vitals stable
- **Labs:**
  - A1C 9.8%, remainder of labs unremarkable

What are the features that put her at risk of an eating disorder?

BMI: Body mass index; CHO: Carbohydrate; FHx: Family medical history; PMH: Personal medical history; T1DM: Type 1 diabetes mellitus; U: Units

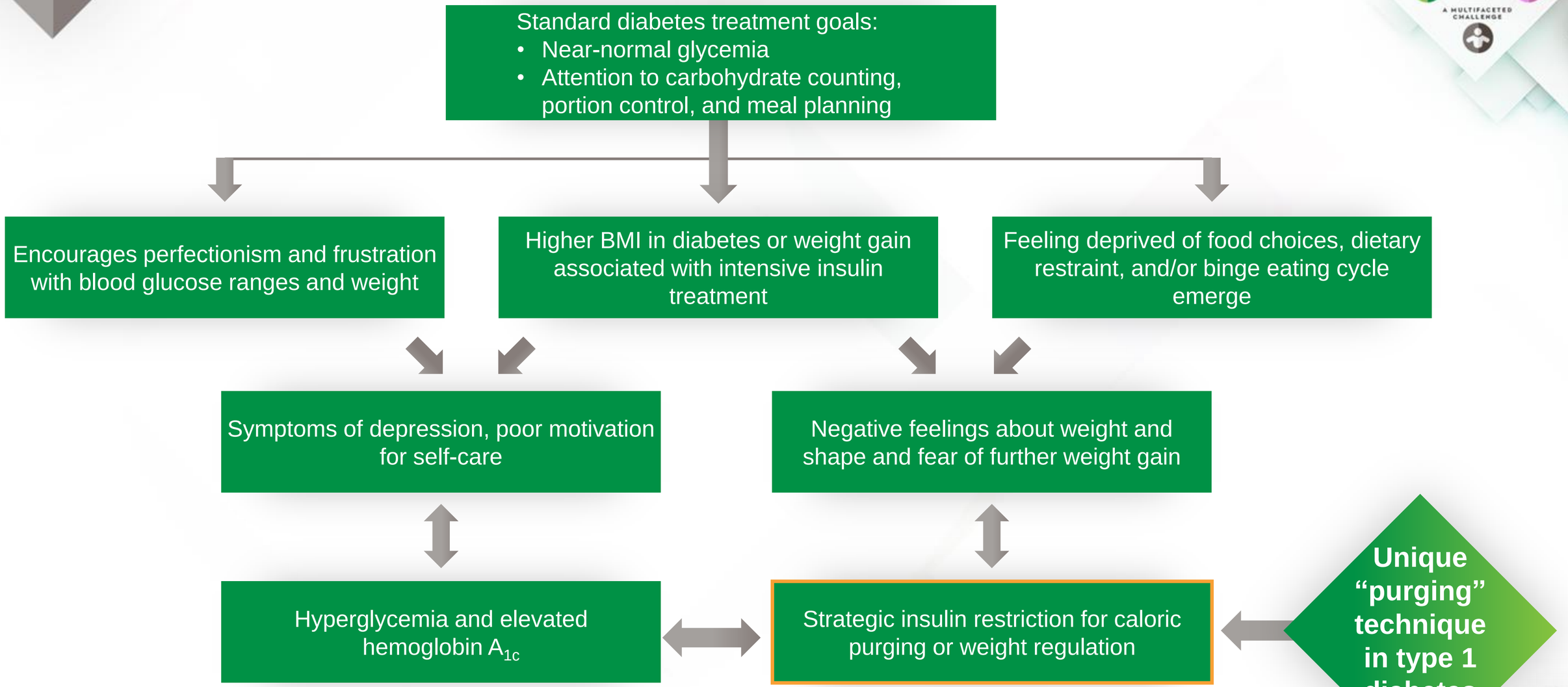
T1DM MAY PREDISPOSE INDIVIDUALS TO EATING DISORDERS

- Age of onset of T1DM → adolescence
- Weight loss and smaller body size at time of diagnosis → social approval
- Impact of multiple daily injections or CSII on weight → 10.45 lbs weight gain in the DCCT
- Carbohydrate counting, portion size control, exercise → body pre-occupation
- Restriction of insulin & resulting weight loss → positive social feedback
- Prolonged dependency on parents while longing for autonomy

CSII: Continuous subcutaneous insulin infusion; DCCT: Diabetes Control & Complications Trial; T1DM: Type 1 diabetes mellitus

DCCT Research Group. *Diabetes Care* 1988;11(7):567-73.

EATING DISORDERS IN TYPE 1 DIABETES



Goebel-Fabbri AE. *Cur Diabetes Rep* 2009: 9:133–39.

THE DEADLY DUO

- In patients with T1DM, eating disorder behavior was associated with **increased microvascular disease & mortality** at 8-12 year follow-up
- Patients with T1DM who responded positively to the question: *“Do you take less insulin than you should?”* (insulin restriction) had a **3-fold increased risk of mortality** during 11 year follow-up

T1DM: Type 1 diabetes mellitus

Peveler et al. *Diab Care* 2005; 28(1): 84-8; Goebel-Fabbir AE, et al. *Diab Care* 2008; 31:415-19.

All of the following are clinical clues of an eating disorder in young women, except:

1. Regular menses
2. Elevated A1C with no clear explanation
3. Unexplained weight gain and weight loss
4. Unexplained episodes of DKA with stressors
5. Falsified BG and lost glucose meters

BG: Blood glucose; DKA: Diabetic ketoacidosis

CLINICAL CLUES OF EATING DISORDERS

- Elevated A1C with no clear explanation
- Unexplained weight gain and weight loss
- Body pre-occupation
- Unexplained episodes of DKA with stressors
- Falsified BG and lost glucose meters
- Exercise excess with serious hypoglycemia
- Restrictive calorie meals
- Frequent requests for weight loss strategies
- Irregular menstrual periods

BG: Blood glucose; DKA: Diabetic ketoacidosis

Turner, H & Peveler, R. *Psychiat Eating Dis* 2005; 4(4):30-3.

CLINICAL CLUES OF EATING DISORDERS

- Restricting insulin secondary to eating too many carbohydrates
- Limited use of insulin during specific stressors
- Breaks from care because diabetes is burdensome
- Fear of hypoglycemia can mask insulin restriction
- Out of control treatment (binge) of low BG - anxiety or permission to binge
- Fears of lows because proper treatment means loss of dietary restriction

BG: Blood glucose

Turner H & Peveler R. *Psychiat Eating Dis* 2005; 4(4): 30-3.

INITIATE A DIALOGUE WITH STATEMENTS LIKE...

Many people struggle with their body image, is that something that you think or worry about?

Diabetes can be very burdensome. How do you cope with the daily demands of testing, insulin, and carbohydrate counting?

Many people report they just want a break from diabetes. Are there times when you simply grab a snack in a rush and don't take insulin?

Do you sometimes take less insulin than you should?

If an eating disorder is suspected, what should you do?

TREATMENT OPTIONS

- Comprehensive multidisciplinary team: endocrinologist, dietitian, diabetes educator
- Inpatient stay necessary if medically unstable
- Day hospital programs
- Educate that DKA can occur even with small insulin dosages
- Weekly session with therapist
- SSRIs for binge eating or bulimia associated with depression
- SSRIs for depression and anxiety

DKA: Diabetic ketoacidosis; SSRI: Selective serotonin reuptake inhibitor

Bermudez O et al. Diab Spec 2009; 22(3):153-8; Goebel-Fabbri AE et al. Diab Spec 2009; 22(3): 147-52.

GOALS OF TREATMENT

- Increasing or normalizing insulin doses
- Easing restriction or binging
- Normalizing eating patterns
- Counting carbohydrates and giving sufficient insulin
- Process steps:
  - Small incremental improvements
  - Avoidance of perfectionistic standards
  - Cycling through shame, guilt and secrecy

Turner H & Peveler R. *Psychiat Eating Dis* 2005; 4(4): 30-3.

RESOURCES: WEBSITES

- Bulimia Anorexia Nervosa Association
  www.bana.ca
- Eating Disorders Anonymous
  www.eatingdisordersanonymous.org
- National Eating Disorders Association
  www.nationaleatingdisorders.org
- Harvard Eating Disorders Center
  www.hedc.org
- International Association of Eating Disorders Professionals
  www.iaedp.com
- National Association of Anorexia Nervosa and Associated Disorders
  www.anad.org
- National Eating Disorders Information Centre
  www.nedic.ca

DISCUSSION WITH CINDY…

- She reveals that she withholds insulin on a regular basis to address the weight gain she has experienced since diagnosis
- She feels shame and guilt about this and has not shared this with anyone
- You explain to Cindy that she is not alone and that others are also experiencing the same thing
- She agrees to a referral to an Eating Disorder Centre

Binge Eating Disorder and Type 2 Diabetes

The new eating disorder diagnosis

A 48-YEAR-OLD FEMALE

- **Profile:**
  - A 48-year-old woman
  - Office administrator, divorced, no children
  - T2DM x 6 years
- **Current illness:**
  - Sleep disturbances: difficulty falling asleep, non restorative sleep, daytime fatigue
  - Recurrent dieting, frustrations around body image
- **FHx**:
  - Depression
- **PMH**:
  - Chronic low grade depressive state
- **Physical exam:**
  - BMI 34 kg/m^2
- **Labs**:
  - A1C 8.2%, one year ago A1C 7.0%
- **Medications:**
  - Metformin, DPP-4 inhibitor, statin

What are the features that put her at risk of an eating disorder?

BMI: Body mass index; FHx: Family medical history; PMH: Personal medical history;T1DM: Type 1 diabetes mellitus

PSYCHIATRIC PERSPECTIVE

PREVALENCE OF BINGE EATING DISORDER AND RISK FACTORS

- 1-3% of the general population
- Up to 30% of obese adults seeking weight loss programs
- T2DM: 2.5%-25.6%
- Individuals with T2DM and binge eating disorder (BED) tend to be younger, have greater depressive symptoms, and have more psychopathology.

BED: Binge eating disorder; T2DM: Type 2 diabetes mellitus

American Psychiatric Association. *Diagnostic and statistical manual of mental disorders.* 5th ed. Arlington, VA: American Psychiatric Association; 2013; Hudson JI et al. *Biol Psychiatry*. 2007;61(3):348-58; Crow S et al. *Int J Eat Dis* 2001; 30(2):222-6.

BED IS ASSOCIATED WITH COMORBID CONDITIONS

Physiological

- Obesity/overweight (78%)
- **Metabolic syndrome (any component) (40%)**
- Hypertension (24%)
- **T2DM (10%)**
- Chronic pain
- Chronic headaches

Psychiatric

- Anxiety disorders (65.1%)
- Depressive disorders (32.3%)
- Post-traumatic stress disorder (PTSD) (26.3%)
- Substance abuse (23.3%)
- Attention-deficit/hyperactivity disorder (ADHD) (19.8%)
- Bipolar disorders (12.5%)

79%
of patients with BED meet criteria for other psychological disorders

BED: Binge eating disorder; T2DM: Type 2 diabetes mellitus

American Psychiatric Association. *Diagnostic and statistical manual of mental disorders.* 5th ed. Arlington, VA: American Psychiatric Association; 2013.; Kessler RC, *et al.*. *Biol Psychiatry* 2013;73(9):904-14.; Brewerton TD, *et al. Int J Eat Disord* 2014;47(7):836-43; Fernández-Aranda F, *et al*. *BMC Psychiatry* 2013;13:166; Hudson JI, *et al. Am J Clin Nutr* 2010;91(6):1568-73.

SCREENING QUESTIONS FOR BED

Have you ever felt that your eating was out of control?

- *Follow up with quantifying the amount of food consumed… What would be an example of what you might consume?*
- *…. A family-size bag of chips*
- *…. A container of….*
- *….A bag of ….*

Was the eating intentionally done in secret?

Have you done anything to reverse or undo the eating behaviour like skipping meals, exercising or throwing up?

BED: Binge eating disorder

DISCUSSION WITH MINDY

- Eating 2 chocolate bars daily in a rapid, out-of-control fashion, followed by guilt
- No purging
- No substance abuse
- Early history of trauma
- Current stresses are work related
- Few supports
- “Depressed. Diabetes is out of control and binge eating”
- PHQ-9 depression scale = 13
  - Diagnosis: moderate major depression

PHQ: Patient health questionnaire

DISCUSSION WITH MINDY

FURTHER INQUIRIES ABOUT HER BINGE EATING:

“Do you feel that it is related to your depression?”

- Yes

“Does your eating sometimes feel out of control?”

- Yes, significant helplessness and hopelessness

“Do you have episodes where you consume large volumes when you are not that hungry?”

- Yes, bags of cookies and/or large chocolate bars

“How do you feel about these binge episodes?”

- I’m really ashamed. I feel hopeless.

What are the treatment options for binge eating disorder?

TREATMENT OPTIONS

Dietary

Nutritional counselling

Normalized food intake and eating behaviour

Pharmacologic

Antidepressants

Anticonvulsants

Substance abuse treatment agents

Centrally acting sympathomimetics

Psychological

Individual/group therapy

Cognitive behavioural therapy (CBT)

Interpersonal psychotherapy (IPT)

Dialectical behavioural therapy (DBT)

Mindfulness-based therapy

Note: None of these medications currently have an indication for BED in Canada

BED: Binge eating disorder

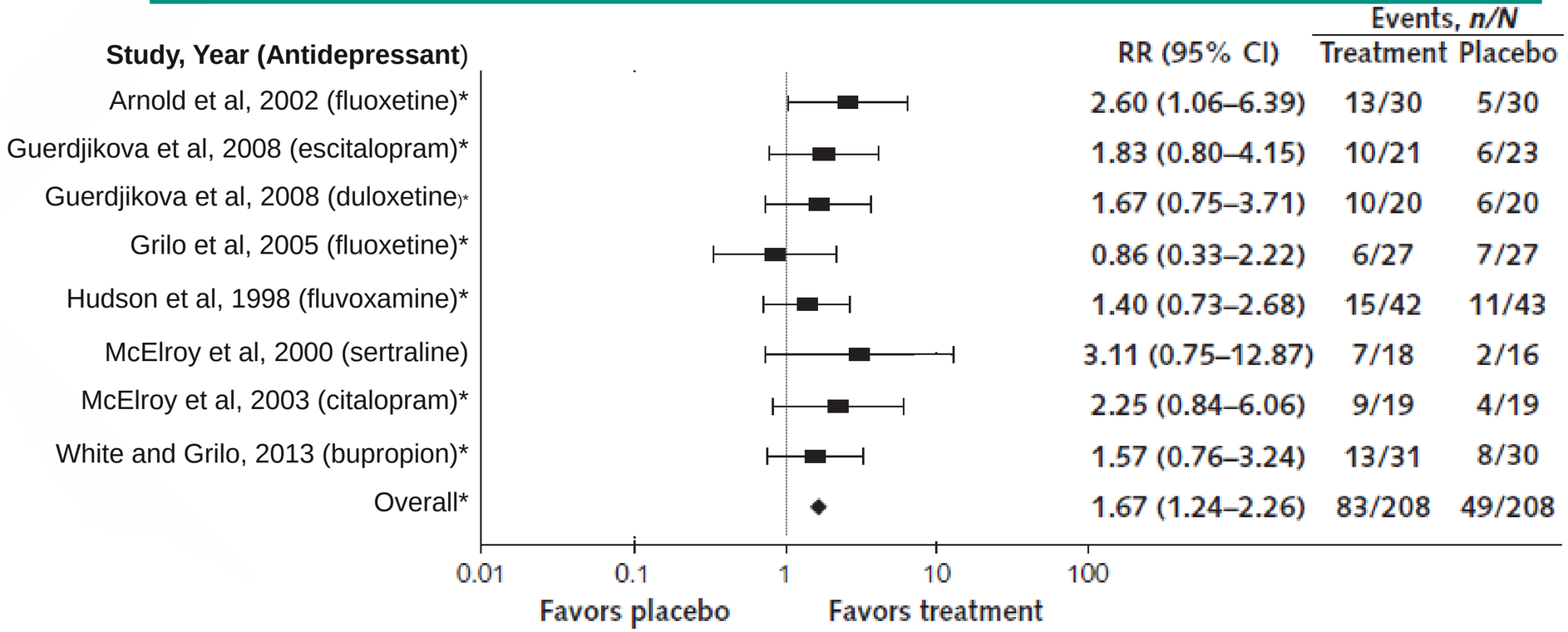
Carter WP, *et al. Int J Eat Disord.* 2003;34 Suppl:S74-88; Wonderlich SA, *et al*. *Int J Eat Disord.* 2003;34 Suppl:S58-73; Ozier AD, Henry BW, American Dietetic Association. *J Am Diet Assoc.* 2011;111(8):1236-41; Hofmann SG, Sawyer AT, Fang A. *Psychiatr Clin North Am.* 2010;33(3):701-10; Goracci A, *et al*. *J Addict Med.* 2015;9(1):1-19; Sim LA,, *et al. Mayo Clin Proc.* 2010;85(8):746-51.

IPT VS. CBT FOR BED (WILFLEY)

- Wilfley D, *et al*: A randomized comparison of group CBT and group IPT for 162 overweight patients with BED (2002)
- 20 sessions: CBT or IPT, 79% and 73% abstinent of binges following the therapy (*p* = NS)
- One year follow up: 59% and 62% were abstinent (*p* = NS)
- Long-term maintained over four years

EFFECT OF SECOND-GENERATION ANTIDEPRESSANTS ON ABSTINENCE FROM BINGE EATING

Meta-analysis suggests antidepressants increase abstinence from binge eating by 1.7x vs. placebo



BED PHARMACOTHERAPY TREATMENT

- **Anticonvulsants -** Topiramate – BED without comorbidities, RCT, multiple sites (407 subjects), mean dose 300 mg

  Results: decreased binge frequency (*p* <0.001), significant weight loss (4.9 kg +/- 5.1; *p* <0.001), higher remission rate of BED (*p* <0.001)

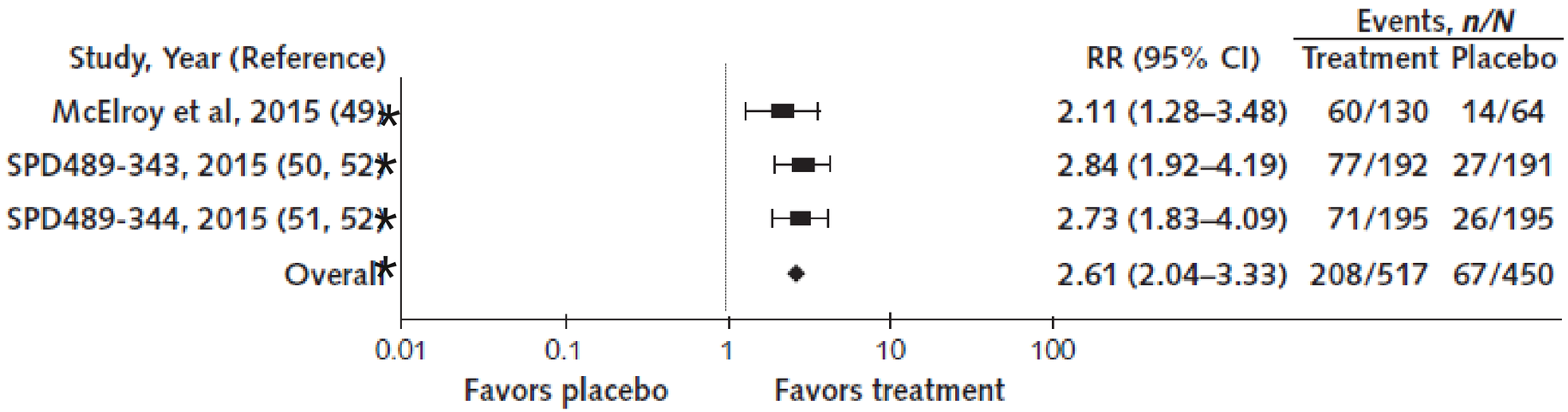
  Side effects: paresthesia, cognitive issues, fatigue

  TPM-induced cognitive impairment is significant on multiple neuropsychiatric scales (Neurology 2005)

BED PHARMACOTHERAPY TREATMENT: PSYCHOSTIMULANTS

EFFECT OF LISDEXAMPHETAMINE ON ABSTINENCE FROM BINGE EATING

Meta-analysis suggests LDX increases abstinence from binge eating by 2.6X vs. placebo



**p* <0.05

BACK

PATIENT EDUCATION

- Explain that BED is common and is worsening their A1C
- Highlight that dieting makes it worse
- Remind the patient that BED is making them gain weight and worsening their diabetes
- Normalizing eating is critical for recovery (three meals and snacks)
- Addressing the underlying psychiatric condition is critical

BED: Binge eating disorder

TREATMENT & FOLLOW-UP

Treatment over time

- Psychoeducation on BED
- Fatigue management with cognitive behavioural strategies
- Initially: SNRI for depression with partial remission
- Next: Trazodone 50 mg for sleep disturbance with partial remission of BED and mood stabilized
- Normalize eating strategies

Results

- BED in remission
- Weight loss of 10 pounds (normalized eating)
- A1C to be re-assessed

BED: Binge eating disorder; SSRI: Selective serotonin reuptake inhibitor

SUMMARY

- Individuals with diabetes can have eating disorders:
  - Anorexia nervosa (or insulin restriction) is more common with T1DM
  - Bulimia nervosa and binge eating disorder are more common with T2DM
- In both cases it is important to provide:
  - Comprehensive, multidisciplinary treatment and therapy
  - Education on the impact of eating disorder on their A1C and diabetes
- Treatment of the underlying psychiatric disorder is crucial

T1DM: Type 1 diabetes mellitus;T2DM: Type 2 diabetes mellitus

THANK YOU!

Questions?

Comments?

Thoughts?

BACK TO MAIN MENU