

# Pediatric Medical Nutrition Therapy for Comorbid Type 1 Diabetes and Eating Disorders

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## Overview of T1D & EDs

**Type 1 Diabetes Mellitus (T1D) is an autoimmune disease in which the body's immune system destroys the insulin-producing beta-cells in the pancreas, resulting in insulin deficiency.**<sup>1,2</sup>

> Treatment involves insulin therapy to manage blood glucose (BG) levels. Insulin is dosed based on current BG readings and amount of carbohydrates consumed.<sup>1</sup>  
> Management also includes intensive nutrition education and ongoing self-monitoring of carbohydrate intake in order for insulin to be dosed correctly.<sup>1</sup>

**Disordered Eating Behaviors (DEBs) and Eating Disorders (EDs) are an increasing issue among adolescents and adults with T1D.**<sup>1-3</sup>

> **DEBs** are problematic eating behaviors that are not frequent or severe enough to merit a formal ED diagnosis.<sup>2-4</sup> They include food restriction for weight loss, compulsive and excessive eating, self-induced vomiting, excessive exercise, and excessive use of laxatives or diuretics for weight loss.<sup>2,3</sup>  
> **EDs** are diagnosable conditions characterized by a preoccupation with food and body weight resulting in DEBs and compensatory weight control behaviors.<sup>3</sup> EDs can develop in childhood, adolescence, or adulthood and may require lifelong management.<sup>3</sup>  
> The most common DEB in the T1D population is **insulin omission** for the purposes of weight loss, a purging DEB unique to individuals with insulin-dependent diabetes.<sup>3</sup>

**Both T1D and EDs have high rates of morbidity and mortality, making the combination of the two extremely dangerous.**<sup>1</sup>

> Comorbid DEBs/EDs in the context of T1D have been associated with a three to five-fold greater risk of premature death.<sup>3,5</sup>  
> The risk of premature death is even higher if insulin omission DEBs are present.<sup>6</sup>  
> Clinicians may have trouble distinguishing healthy behaviors for T1D management from unhealthy DEBs/EDs.

## T1D as a Risk Factor for EDs

> T1D management emphasizes attention and monitoring of food, eating, and weight.<sup>3,5</sup>  
> DEBs/EDs can be a coping mechanism for patients with T1D to regain control over their lives and bodies.<sup>3,5</sup>  
> T1D can increase body dissatisfaction; patients may lose weight prior to diagnosis, followed by weight regain after starting insulin.<sup>3,5</sup>  
> Rigid food rules for managing T1D can create feelings of guilt and shame if rules are violated or BG levels are not perfectly managed.<sup>5</sup>

## Patient Case and Clinical Course

Patient (Pt) is a 15 year old female who was previously diagnosed with T1D at age 11.

Date	Event
April 2023	Initial nutrition assessment with Seattle Children's Endocrine clinic. Managing T1D with insulin pump and continuous glucose monitor (CGM). Pt had lost 6% of body weight over 6 months. Would occasionally skip lunch. RD discussed importance of consistent meals for stable BG levels.
July 2023	Visit with RD after pt's Mom notices DEBs. Pt had lost 19% of body weight over 3 months. Pt reported using the Lose It! app since T1D diagnosis to count carbohydrates, but had started using it to count calories and set weight loss goals. Food logs indicated pt was eating 600-850 kcals/day.
Aug. 2023	RD administered ED assessment. Pt reported not eating during the day, hiding food in pockets, binge eating x1/month, body checking and weighing, loss of hunger cues, and exercise as a compensatory method. Would omit insulin over several hours to prevent a low BG reading on CGM, which would notify pt's Mom and "force" pt to eat a snack. NFPE found signs of severe malnutrition and anorexia, including amenorrhea x9 months. Nutrition diagnoses were severe malnutrition and anorexia nervosa ED. RD reinstated basal-bolus insulin dosing supervised by Mom, set goals to remove scale from home, and eat 2 meals daily. Referred to Seattle Children's Adolescent Medicine clinic for ED treatment.
Late Aug. 2023	Saw Endocrine RD a few days later. Pt had now lost 25% of body weight. Mom blocked calorie counting apps on phone, but pt start using phone calculator to track calories. Mom put black tape over all nutrition labels in the home. Provider visit the same day revealed severe bradycardia, capillary refill >3 sec, and two recent syncopal episodes. Provider admitted pt to Seattle Children's Hospital (SCH) on the eating disorder refeeding pathway.
Mid-Sept. 2023	Inpatient multidisciplinary team included endocrinology, nutrition, psychiatry, and adolescent medicine to manage nutritional, diabetic, and mental health needs. The inpatient RD set a treatment goal weight of 64 kg and estimated needs at 2,600-3,000 kcals/day (BMR x 1.7-2). Initial goal was 2,000 kcals/day, advancing by 400 kcals/day until 3,000 kcals/day goal reached.
Late Sept. to Oct. 2023	Pt frequently had hyperglycemic episodes while on the ED refeeding pathway. Endocrinology reported difficulty giving correcting insulin boluses since pt was required to eat every 2 hours. Pt was restarted on insulin pump and recommended lower glycemic snacks by Endocrine RD.
Nov.-Dec. 2023	Pt remained hospitalized on ED refeeding pathway for 18 days. Achieved goal of consistently eating >3,000 kcals/day by day 6, and regained 6% of body weight over hospital course. Mom requested a referral to the Emily Program (EP) following discharge. The EP recommended pt be admitted to their residential program, but declined her due to their inability to manage her T1D.
Jan. 2024	After discharge, Mom prepared all meals and snacks for pt and counted carbohydrates. Pt would enter carbohydrates into insulin pump, and Mom would confirm appropriate amount had been entered. Admitted to the EP's partial hospitalization program with the arrangement that Mom would prepare pt's meals and manage her T1D.
Nov.-Dec. 2023	Amenorrhea resolves. Continuing to work towards goal treatment weight. Admitted to the EP's intensive outpatient program (IOP).
Jan. 2024	Discharged from the EP IOP at 5.4 kg below goal treatment weight. Continuing to see RDs in the Seattle Children's Endocrine and Adolescent Medicine clinics to manage her T1D and ED recovery. Still following the EP meal plan and working towards goal treatment weight. Planning to enroll in public school in the fall.



## MNT for T1D & EDs

There are currently no formal guidelines for RDs working with T1D and ED patients. One ADA research article suggests:

- > MNT should be individualized and appropriate for both T1D and the ED. The goal should be to help patients achieve balanced nutrition while keeping BG levels close to target ranges.<sup>7</sup>
- > RDs should use flexible, non-depriving MNT approaches to T1D rather than a rigid focus on carbs.<sup>7</sup>
- > While T1D and ED MNT approaches can appear to be at odds, both should normalize eating and use an all-foods-fit approach. However, patients will still need to carbohydrate count for T1D.<sup>7</sup>

## Discussion

This case illustrates how an ED can develop from T1D and the medical complexities involved when managing both conditions simultaneously.

> Pt's DEBs began with the use of the Lose It! app, which she started using to help with carbohydrate counting for her T1D. This eventually escalated to more extreme DEBs, including insulin omission out of fear of hypoglycemic episodes that would be followed by "forced" consumption of sugary foods.

The pt's T1D presented obstacles to her ED recovery.

- > Pt had frequent hyperglycemic episodes in the hospital, creating difficulty with insulin correction dosing on the ED refeeding pathway.
- > The Emily Program denied her acceptance to their residential program because they could not manage her T1D.
- > Pt will still need to count carbohydrates (currently managed by Mom) for her T1D management. This could present an ongoing barrier to recovery, particularly in adulthood.

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