Diabetes Management in the School & Childcare Setting

Empowering School Nurses in Nourishing Kids with Type 1 Diabetes

Tariro Savoy, MS RDN CDCES

Disclosures

Tariro Savoy, MS, RD, CDCES

Certified pump trainer for Omnipod (Insulet) and Tandem. I will not be discussing or prompting certain pumps.

No other conflicts to disclose.

You are what you eat- what does it mean for you and the kiddo

- Its not only physical

ego ratatouille - Google Search

Overview

- Nutrition requirements of kids and teens
- Current dietary intake
- Dietary guidelines
- Eating Disorders
- Toolbox

Nutritional Considerations
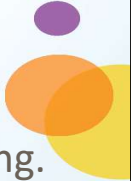
Growth and development are rapid

- Onset of puberty – characterized by a spurt in height and weight
- Considerable gain in muscle and bone mass
- Changes in body composition
- Increased fat in girls
- Energy and nutrient requirements are at their highest

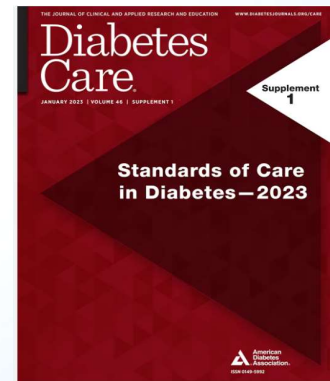# Healthy Relationship with food- it's important

Following a healthy dietary pattern is crucial:

- Important for proper growth and development
- Prevention of chronic conditions (e.g. dental caries and heart disease)
- Eating a healthy breakfast is associated with improved cognitive function (especially memory), reduced absenteeism, and improved mood.
- Adequate hydration may improve cognitive function in children and adolescents, which is important for learning.
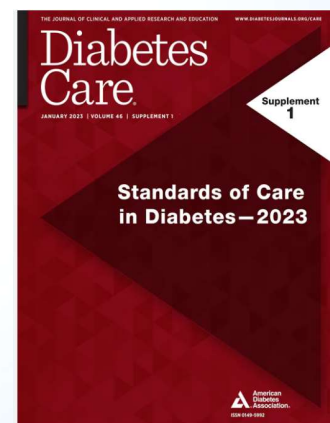
Nutrition Recommendations

- Nutrition management is individualized:
- ➢ Based on family habits, food preferences, religious or cultural needs, finances, schedules, physical activity
- ➢ Youth's & family abilities in numeracy, literacy and self management should be considered.
- ➢ Comprehensive education by RDN at diagnosis and annually/as needed
- ❖ Assess in food preferences, food security, growth and development, weight status, cardiovascular risk, potential for disordered eating

- Monitoring carbohydrate intake, whether by carbohydrate counting or experienced based estimation, is a key component to optimizing glycemic management

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Diabetes Care.
JANUARY 2023 | VOLUME 46 | SUPPLEMENT 1

Supplement 1

Standards of Care in Diabetes—2023

American Diabetes Association.
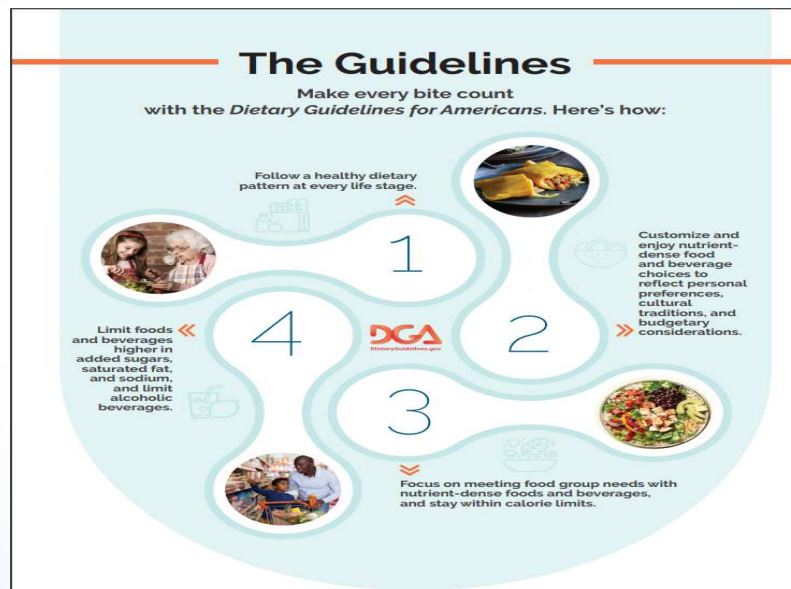ISSN 0149-5992

Nutrition Recommendations

- An individualized MNT (medical nutrition therapy) program provided by a registered dietitian is recommended for all people with diabetes.
- Current scientific evidence:
- ➢ No single ideal dietary distribution of calories among carbohydrates, fats, and proteins for people with diabetes,
- ➢ Individualized.

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Dietary Guidelines Across the Life Span 2020-2025

Key Take Away -One Size **Does Not** Fit All

- No one size fits all to dietary pattern and diabetes
- Individualized dietary pattern
- Maintain pleasure of eating -non-judgmental messages
- Help build a foundation
  - ➢ Healthful eating patterns
  - ➢ Not Focus on individual macronutrients and micronutrients or single foods

Current Realities: What kiddos in the US are eating

- NHANES (NHANES 2017–2018) -self-reported dietary intakes for children and adolescents (2–19 years) reflect an energy distribution of approximately 51% from carbohydrate, 14% from protein, and 35% from fat
- More than 85% of youth exceed   the recommended limit of saturated fat intake of 10% of total daily energy intake
- Total sugars contribute more than 20% of calories per day
- Sugar-sweetened beverages among children and adolescents accounts for 10% of total caloric intake

Current Realities: What kiddos in the US are eating

- Sugar-sweetened beverages among children and adolescents accounts for 10% of total caloric intake
- Most youth still do not meet fruit and vegetable recommendations
- Greater than 70 % of adolescents 14-18 y/o significantly exceed recommendations to limit added sugar to no more than 10% of calories.
- Dietary fiber intake, average 14 g per day, significantly lower than recommended at least 26 g dietary fiber in children 9 years and older.

Current Realities: What kiddos in the US are eating

- Empty calories from added sugars and solid fats contribute to 40% of daily calories for children and adolescents age 2–18 years—
- Affects the overall quality of their diets.
- Approximately half of these empty calories come from six sources: soda, fruit drinks, dairy desserts, grain desserts, pizza, and whole milk.
- Most youth do not consume the recommended amount of total water

Cultural Sensitivity- Nourishing Diversity

Resources
- https://oldwayspt.org/
- http://www.fao.org/infoods/infoods/tables-and-databases/en/
- http://lanic.utexas.edu/la/region/food/
- http://www.wsmclinic.com/formpdf/South-Asian-Carb-Counting-tool.pdf

Debunking the Myths- Current Evidence

Whole Child Wellness– A holistic Approach

Myth: Kids with Type 1 Diabetes can never eat sweets.

Fact:

- Can eat a certain amount of sugary food as part of a balanced diet
- Need to account for the carbs they eat, which includes sugary treats for insulin coverage.
- Sweets are empty calories providing no real nutritional value other than calories
- Should be limited — but not necessarily eliminated.

All kids (and adults!) should avoid excessive consumption of foods that provide little nutritional value and can crowd out healthier foods.

Whole Child Wellness– A Holistic Approach

Myth: Low-carbohydrate diets are good for kids with diabetes because they should avoid carbs.

Fact:

- Carbohydrates are the body's preferred source of energy
- Low-carb diets tend to be overloaded with protein and fat
- A high-fat, high-protein diet over the long term may increase the risks of heart and kidney disease in adulthood (which people with diabetes are already at increased risk for).
- **Children with diabetes should follow a healthy, balanced dietary pattern.**
- **Focus on balancing carbohydrate intake with medication and exercise to achieve good diabetes control.**

Brief Carbohydrate Identification

- Fruits
- Vegetables
- Protein
- Grains
- Dairy

"Individuals with type one diabetes require exogenous insulin, so their **primary goal** is to integrate insulin therapy into their preferred eating routine and physical activity pattern."

The Art and Science of Diabetes Care and Education, p 161

Insulin for Carbohydrate Coverage vs Correction

Insulin to Carbohydrate Ratio:
- The amount of carbohydrates "covered" by 1 unit of insulin
- Given **anytime** the student consumes the minimum number of carbohydrates indicated in the insulin to carbohydrate ratio (ICR) in one sitting

Insulin Correction Factor (aka insulin sensitivity factor or ISF):
- The number of BG "points" (mg/dL) 1 unit of insulin will reduce glucose level
- Used to calculate the amount of insulin needed to bring a student's blood glucose into target range
- Only given every 3-4 hours, typically at mealtime

Insulin-to-Carbohydrate Ratio (ICR)

Example: If the student's ICR is 1 unit for every 20 grams of carbohydrates (1:20), the student will take 1 unit of insulin for every 20 grams of carbohydrates they eat.

Question: What are the potential negative impacts if you do not round down for carbohydrate coverage?

Carbohydrates (grams)	Insulin (units)
20	1
40	2
60	3
80	4

For students on multiple daily injections, always round **DOWN** for carbohydrate coverage

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Carbs to Carbs

- School Nurse/Healthcare Paraprofessional Role: To help the student count the carbohydrates that will be consumed without bias or judgement of the student's eating pattern.
- While there is significant nutrition composition difference between an apple and a Twinkie, a student who has an ICR of 1:20 would need the same amount of insulin to cover for either food item.

1 Medium apple = 20-25 grams of carbohydrates

1 Twinkie = 23 grams of carbohydrates

Treatment of Low BG's

Hypoglycemia Treatment w/ 15-15 Rule

BG <70 mg/dL → Intake 15 g Carbs → Wait 15 Min → Check BG

BG still Low?

15 Grams of Carbs Examples

- ½ Cup of Fruit Juice
- ½ Cup of Soda (NOT diet)
- 1 Tablespoon or sugar, honey, or corn syrup
- Hard Candies
- Glucose Tabs

- Rule of 15: For BG ≤ 70, administer 15 g fast-acting carbs, wait 15 minutes, recheck BG. Repeat for BG below target.
- Never administer insulin for carbs given to treat a low.
- Do all children need 15g carbs?
- For students on CGM: Recommend utilizing glucose meter if CGM does not show within target range after 15 minutes
- If low at mealtime, treat low first. Once at goal, proceed with meal and administer per IHP.

Resources
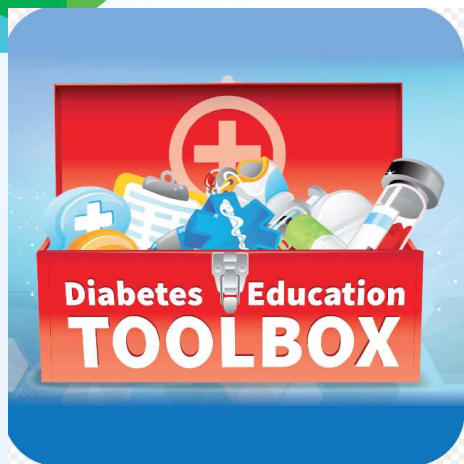
Internet search, Siri, Alexa, Apps, Books
Apps for Phones
Calorie King Application
My Fitness Pal

Websites
- https://diabetes.org/healthy-living/recipes-nutrition/understanding-carbs/carb-counting-and-diabetes
- https://diabetesed.net/carb-counting-made-easy-free-resource/

Diabetes Education TOOLBOX

Top Recommended Diabetes Apps

Name of App	Compatibility	Cost	Category	Description
BD Briight: Diabetes Assistant	Apple/Android	Free	Management and Monitoring	• Nutrition advice, healthy recipes, and activities • Digital diabetes assistant available 24/7 • Voice recognition for logging insulin doses/blood glucose, asking question
CalorieKing	Apple	Free, with in-app purchases	Nutrition and fitness	• Curated food database of nutrition information • Includes many fast-food chains and restaurants
Figwee	Apple	Free with in-app purchases	Nutrition and fitness	• Visualization tool for learning different portion sizes of food items with nutrition data • Paid upgrade tracks what you eat, allows custom food entry, records progress
Fooducate	Apple/Android	Free, with in-app purchases	Nutrition and fitness	• Nutrition tracking tool • Individualized nutrition grade for each food • Personalization for age, sex, weight loss goal • Community support
Glucagon	Apple/Android	Free	Management and Monitoring	• Step-by-step instructions (text and video) for using glucagon for injection: 1 mg (1 unit) • Tracker for glucagon kit locations and expiration dates • Reminder notifications
MyFitnessPal	Apple/Android	Free, with in-app purchases	Management and Monitoring	• Tracking tool for exercise, nutrition • Connects with fitness trackers and other health apps • Large food database with nutrition information • Individualized based on sex, age, weight loss goal
MySugr	Apple/Android	Free, with in-app purchases	Management and Monitoring	• Tracking tool for blood glucose, mood, carbohydrates, medications • Reports for HCPs • Paid upgrade adds reminders
One Drop	Apple/Android	Free	Management and Monitoring	• Tracking tool for blood glucose, mood, carbohydrates, medications • Integrated nutrition database • Reminders • Reports for HCPs
Relax Lite	Apple/Android	Free, with in-app purchases	Stress Management	• Guided breathing and meditation exercises
Tidepool	Apple/Android	Free	Management and Monitoring	• Compatibility with many devices (glucose meters, CGM devices, insulin pumps) • Tracking tool for insulin, CGM, nutrition, and blood glucose data with notes • Reports for HCPs

Is There an App for That? The Pros and Cons of Diabetes Smartphone Apps and How to Integrate Them Into Clinical Practice, David T. Ahn, Rachel Stahl, Diabetes Spectrum Aug 2019, 32 (3) 231-236; **DOI:** 10.2337/ds18-0101

Compliments of www.Diabetesed.net August 2019 *(app rating based on DANA criteria: DANAapps.org)*

Eating Disorders

Eating disorders are behavioral conditions characterized by severe and persistent disturbance in eating behaviors and associated distressing thoughts and emotions.

Affect up to 5% of the population, most often develop in adolescence and young adulthood.

Six main feeding and eating disorders are now recognized in diagnostic systems: anorexia nervosa, bulimia nervosa, binge eating disorder, avoidant-restrictive food intake disorder, pica, and rumination disorder

Occur at approximately twice the rate in individuals with Type 1 Diabetes compared to general population

Eating Disorders

Table 1

Characteristics of eating disorders (EDs) and disordered eating symptoms (DES) among adolescents with type 1 diabetes.

Characteristic	Risk factor
Age	7–18 years
Gender	Female
Dietetic approach	Detailed meal planning, precision in food proportion
Body mass index	Overweight, obesity
Body perception	Body dissatisfaction
Personal characteristics	Anxious, poor quality of life
Family support	Poor attention in family to healthy eating, maternal overweight or binge-eating disorders in mothers
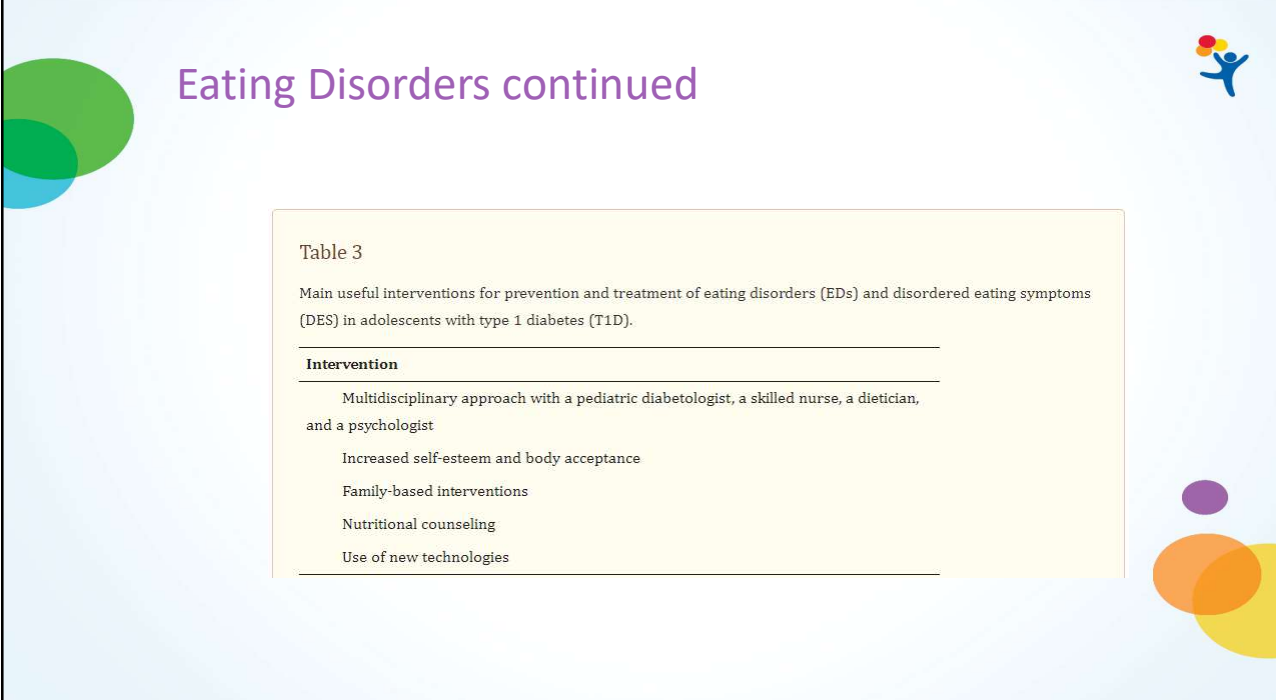
Table 2

Diagnosis of eating disorders (EDs) and disordered eating symptoms (DES) in adolescents with type 1 diabetes (T1D).

Suspicion

- Poor glycemic control
- Recurrence of hypoglycemic episodes
- Systematic calculations of caloric values and weighing of foods
- Frequently missed medical check-ups
- Refusal to be weighed
- Concern for appearance
- Tendency toward vegetarianism

Confirmation

- Revised Diabetes Eating Problem Survey (DEPS-R)
- Modified SCOFF (mSCOFF) test
- Single question: "Have you ever been overweight?"

Eating Disorders continued

Table 3

Main useful interventions for prevention and treatment of eating disorders (EDs) and disordered eating symptoms (DES) in adolescents with type 1 diabetes (T1D).

Intervention

Multidisciplinary approach with a pediatric diabetologist, a skilled nurse, a dietician, and a psychologist

Increased self-esteem and body acceptance

Family-based interventions

Nutritional counseling

Use of new technologies

Resources for Eating Disorders

National Alliance of Mental Mealth
https://www.nami.org/help

National Eating Disorders Association
https://www.nationaleatingdisorders.org/help-support/contact-helpline

Eating Disorder Hope
http://www.eatingdisorderhope.com

American Diabetes Association
Online directory of mental health providers
https://professional.diabetes.org/mhp_listing.

Carb Counting

- Food labels
- Weighing
- Apps

References

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3. https://oklahoma.gov/content/dam/ok/en/health/health2/documents/helping-the-student-with-diabetes-succeed-in-school.pdf

4. https://www.cdc.gov/healthyschools/nutrition/facts.html

5. diabetesed.net

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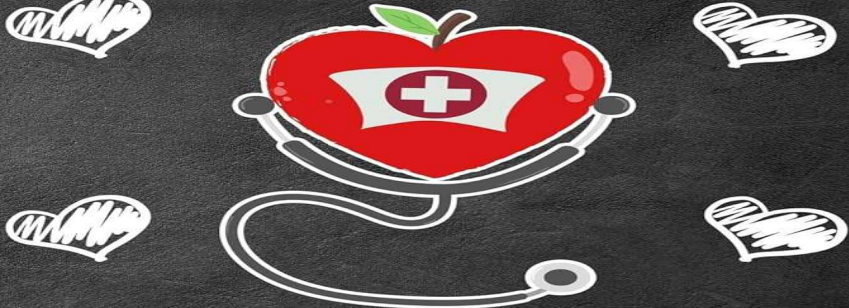
7. Treasure, J., Duarte, T. A., & Schmidt, U. (2020). Eating disorders. *Lancet (London, England)*, *395*(10227), 899–911. https://doi.org/10.1016/S0140-6736(20)30059-3