

## Chapter 8

# Type 1 Diabetes Mellitus in the Inclusive School Setting: Daily and Long Term Effects on Education

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### ABSTRACT

*This chapter will provide readers with a general overview of the pathophysiology and treatment of type one diabetes mellitus. Signs and symptoms of potential diabetic emergencies will be highlighted allowing educators to better care for their students with this disease. Laws protecting this group of students will be reviewed. The different types of education and medical plans available for these students. Lastly, the authors present a comprehensive literature review highlighting the possible neurocognitive effects of this disease.*

### INTRODUCTION

Approximately 215,000 youth under the age of 20 years – or 1 in 400 in this age group- in the United States have type 1 diabetes mellitus (T1DM). T1DM is caused by an autoimmune process that ultimately renders a person unable to make insulin. Without insulin, one's blood glucose increases and, as the body seeks out alternative fuels for energy, ketones, a form of acid, build up in the blood stream creating a situation that can prove lethal. As such, individuals with T1DM are dependent upon taking exogenous insulin either through subcutaneous injections or via a continuous subcutaneous infusion/insulin pump. Insulin dosing is complex since the amount to be given is dependent upon one's activity level, concurrent blood glucose, grams of carbohydrates consumed, and general state of health. Hyperglycemia (high blood glucose) or hypoglycemia (low blood glucose) results when the insulin dose is not balanced appropriately with the aforementioned variables.

In order to maintain good glycemic control, an individual with T1DM must test his/her blood glucose multiple times a day and, depending on the type of insulin regimen, eat fixed amounts of food at certain

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times of day. Even for a child with well controlled T1DM, the multiple responsibilities simply associated with managing his/her disease, such as testing his/her blood glucose before meals, snacks, and physical activity, and administering insulin, can lead to a significant amount of missed class time and instruction. In addition, such responsibilities should not be left solely in the hands of the child. Within the school setting, a multi-disciplinary approach should be taken in order to most appropriately support the medical needs of the child. Training should be provided to all members of the team which should include the child, parent(s)/caregiver(s), school nurse, administrators, classroom and special area teachers, and other personnel such as lunchroom staff, aides, coaches, and bus drivers. The roles and responsibilities of each member of the team should be clearly outlined in the student's diabetes medical management plan (DMMP), Individualized Health Care Plan (IHP), 504 Plan, Individualized Education Plan (IEP), or other education plan. In addition, the diabetes care tasks that a child must routinely take part in may make the child feel singled out and/or different from his/her peers. As a result, school guidance counselors and social workers should take care to monitor the social and emotional impact diabetes may have on the child. Schools are required to provide each child with diabetes this level of service as a result of four federal laws including Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990 (ADA), the Individuals with Disabilities Education Act (IDEA), and the Family Educational Rights and Privacy Act (FERPA).

Since tasks focused on the medical management of diabetes are typically done outside of the classroom, this is perhaps the most obvious disruption of the child's education to teachers and other school personnel. However, a number of studies have suggested that children with T1DM perform poorer on tests of visuo-spatial ability, motor speed, writing, sustained attention, reading, memory, and language, resulting in reduced performance in measures of full scale IQ as well as performance and verbal IQ. Although the data sometimes conflicts, there exists neuropsychological and neurophysiological support for differences between children with and without diabetes in various areas of cognition which can impact learning.

## **Objectives**

After reading this chapter, educators and other individuals involved in caring for children with T1DM in the school setting will be able to:

1. Have a better understanding of the etiology and prevalence of T1DM in children
2. Summarize the differences between T1DM and type 2 diabetes mellitus.
3. Understand the various insulin regimens used by students with diabetes.
4. Identify the signs and symptoms hyperglycemia and hypoglycemia and understand how these episodes need to be treated.
5. Examine how diabetes affects their own students on a day to day basis in the classroom and other areas of the school environment.
6. Discuss the laws protecting children with diabetes within the school setting.
7. Describe key elements needed in an education plan for a student with diabetes.
8. Appreciate that T1DM impacts education and learning more than "disturbing" day to day school routines.
9. Propose and implement ways to encourage optimal learning and development for students with T1DM within inclusive school environments.

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