

An Examination of Educational Policies for Students with Type 1 Diabetes in Catholic School Boards

Julie Corkett^a & Sarah Hastings^b

^aNipissing University, ^bSt. Anthony of Padua Catholic Elementary School

Abstract

As one in 300 children have diabetes, Type 1 Diabetes (T1D) is one of the most common chronic illnesses affecting school-age children (Kelo, Martikainen, & Eriksson, 2011; Kucera & Sullivan, 2011; Lawrence, Cummings, Pacaud, Lynk, & Metzger, 2015). If not appropriately managed, T1D can drastically affect a student's ability to experience academic success. Diabetes Canada, formerly known as the Canadian Diabetes Association, has a set of guidelines that they recommend each school board incorporate into their policies for the management of T1D. The authors analyzed 15 Ontario Catholic school boards' policies pertaining to T1D to determine if these policies address Diabetes Canada's guidelines. Out of the 15 school boards analyzed, only four had a T1D policy. A policy analysis was then conducted on the four policies to determine whether they met the guidelines set out by Diabetes Canada. The four policies were found to be lacking in the areas of staff education regarding T1D and assisting students during hypoglycemic episodes. It is recommended that a standardized Ministry policy be developed that addresses the guidelines outlined by Diabetes Canada.

Keywords: Type 1 Diabetes, Catholic School Board, Policy Analysis, Guidelines

With the incidence of Type 1 Diabetes (T1D) increasing rapidly world-wide, 1 in 300 children have diabetes, making it one of the most common chronic illnesses affecting school age children (Amilategui, Mora, Calle, & Giralt, 2009; Kelo, Martikainen, & Eriksson, 2011; Kucera & Sullivan, 2011; Lawrence, Cummings, Pacaud, Lynk, & Metzger, 2015). T1D is "an autoimmune condition in which the pancreas does not produce the necessary insulin to break down glucose in the bloodstream to convert into energy" (Kucera & Sullivan, 2011, p. 587). T1D normally develops in the pediatric age range and is managed through diet, activity, blood glucose monitoring, and the administration of insulin (Lawrence et al., 2015; Kucera & Sullivan, 2011). Even when individuals properly treat their T1D, they may still experience episodes of hypoglycemia (low blood sugar) or hyperglycemia (high blood sugar) causing an individual to feel shaky, lightheaded, sweaty, drowsy, confused, irritable, and in severe cases, lose consciousness, or have a seizure (Lawrence et al., 2015). Most individuals with T1D can live a relatively normal and healthy life, but if left untreated or improperly managed, T1D can lead to complications such as learning deficits, eye damage or blindness, nerve damage, amputation, kidney failure, stroke, and heart attack (Lawrence et al., 2015). Within Canada, and even within schools that share the same jurisdiction, there is a lack of consistent support for students with T1D and discrepancies in T1D resources and policies (Lawrence et al., 2015). To determine whether Ontario schools are prepared to address the needs of students who have T1D the current study examined fifteen Ontario Catholic School Boards' policies pertaining to T1D and compared the policies with the Guidelines for the Care of Students Living with Diabetes at School as outlined by Diabetes Canada.

Hypoglycemia is one of the most common and acute complications of insulin therapy, causing "headaches, shakiness, nervousness, sweating, irritability, confusion, sleepiness and fatigue, weakness,

dizziness, and dangerous neuroglycopenia. In the most extreme cases, seizures, loss of consciousness, and death may occur” (Driscoll, Raymond, Naranjo, & Patton, 2016, p. 1). The onset of hypoglycemia can occur suddenly and have an immediate effect on a student’s concentration, thought processing, and behaviour (Lawrence et al., 2015). A lack of awareness of hypoglycemia warning signs may lead to a delay in treatment. Furthermore, it is important to note that the initial warning signs of hypoglycemia may dissipate prior to the onset of seizures or loss of consciousness (Driscoll et al., 2016). According to Driscoll et al. (2016), unawareness of hypoglycemia occurs in about 25% of individuals with T1D and leads to a sixfold increase of severe hypoglycemia:

It is difficult to estimate the rates of severe hypoglycemic episodes because of differences in definitions and reporting metrics (Weinstock et al., 2013); however, as many as 35% of individuals with type 1 diabetes have reported experiencing 2-4 or more episodes of hypoglycemia per week (Allen et al., 2001). More recent pediatric data highlight the continued problem of severe hypoglycemia (defined by seizure/loss of consciousness) with rates ranging from 5 to 12% (Fox et al., 2015; Karges et al., 2015). Of particular concern is that a disproportionate number occur in a subset of youth; 79% of severe hypoglycemic episodes occur in 14 % of children with type 1 diabetes (Gonder-Frederick et al., 2011; Rewers et al., 2002). (p. 2)

In a study conducted by Hellems and Clarke (2007), 75% of parents reported that their children have experienced low blood glucose levels that required treatment at school. If caught early, hypoglycemia can be treated with a fast-acting source of sugar, but it can take up to 45 minutes for its effects on intellectual functions to resolve (Lawrence et al., 2015). Furthermore, the academic difficulties students with T1D face may be attributed to their inability to regulate blood glucose levels, which contributes to neuropsychological deficits such as impaired memory, attention, motor skills, and executive functioning (Kucera & Sullivan, 2011; Ryan, van Duinkerken, Eelco, & Rosano, 2016). These physiological effects of T1D can also affect an individual’s academic performance as students with T1D are at a higher risk for social difficulties, emotional difficulties, absenteeism, retention, poor academic achievement, and learning disabilities (Dahlquist & Källén, 2007; Cunningham & Wodrich, 2012; Kucera & Sullivan, 2011; Ryan et al., 2016; Winnick, Berg, Wiebe, Schaefer, Lei, & Butner, 2017).

Since T1D is associated with both academic performance and acute complications, schools must be prepared to address the needs of students who have T1D including ensuring that: the student’s blood glucose levels are checked frequently; the student is receiving their insulin injections (MDI) or are using an insulin pump; the student’s carbohydrate intake is controlled; and, adjustments to the student’s insulin dosages are made to match activity patterns (Lawrence et al., 2015; Kelo et al., 2011; Kucera & Sullivan, 2011). Although the management of T1D is individualized and requires that the student become proficient in self-managing their diabetes, students are most successful managing their diabetes when they can rely on assistance from trained adults within their schools (Peery, Engelke, & Swanson, 2012). In the United States, the Disabilities Act requires that all school and daycare personnel (who are involved with students who have diabetes) are to have adequate training and understanding of general and emergent diabetes care (Schwartz, Denham, Heh, Wapner, & Shubrook, 2010). Despite this federal law Schwartz et al. (2010) have found that some schools are unaware that the law applies to students with T1D, and, as such, schools often do not have individualized care plans for students with T1D. When schools have action plans in place, school nurses are significantly more likely to call 9-1-1 than schools that do not have an action plans in place (Allen, Henselman, Laird, Quiñones, & Reutzler, 2012). In a follow-up study, Driscoll et al. (2015) found that the school nurse was often unavailable, resulting in the student and non-medical school personnel being responsible for T1D medical care. Based on the findings of their study, Driscoll et al. (2015) recommend that school personnel be provided with routine and emergency diabetes training to ensure the maximum safety of students in the school environment.

Nabors, Lehmkuhl, Christos, and Andreone (2003) examined children’s and young adolescents’ perceptions of supportive behaviour by nurses, teachers, and friends that allow them to improve their diabetes management at school. Nabors et al. (2003) found that although many children were taking significant steps toward self-care, they needed support in six areas: “educating staff, availability of supplies, teacher flexibility, help with hypoglycemic episodes, reminders to follow their regimens, and emotional support” (p. 220). Their findings correspond to the fact that teachers and school personnel are often inadequately trained to handle diabetic emergencies and schools lack standardized diabetes care plans

(Schwartz et al., 2010; Hayes-Bohn, Neumark-Sztauber, Mellin, & Patterson, 2004). This lack of support and assistance with self-management may increase the risk of negative complications associated with T1D; therefore, it is essential that school administrators develop policies to ensure that all staff are educated in T1D and assist students with managing their diabetes (Dahlquist & Källén, 2007; Hayes-Bohn et al., 2004; Kucera & Sullivan, 2011).

In the fall of 2014, the Ontario Physical and Health Education Association (OPHEA, 2014) conducted a needs assessment regarding the management of and response to prevalent student medical conditions in Ontario's publicly funded schools. OPHEA examined how schools were supporting students with four prevalent medical conditions: anaphylaxis, asthma, diabetes, and epilepsy (OPHEA, 2015). OPHEA conducted a comprehensive needs assessment by including four major components: (1) an environmental scan; (2) surveys of school superintendents, principals, and public and community health representatives; (3) interviews with key informants in the education and health sectors as well as medical experts; and (4) surveys of parents and secondary students with prevalent medical conditions (OPHEA, 2015). The assessment revealed: inconsistency in the application of policies and procedures and reporting; a lack of clarity regarding roles and responsibilities; varying expectations of school responsibilities; a need for standardized education and training; and a preference for an overarching policy for medical conditions (OPHEA, 2015).

The Canadian Diabetes Association (CDA) produced a set of guidelines to assist the development and implementation of school board T1D policies. The Guidelines for the Care of Students Living with Diabetes at School states that its purpose is to "acknowledge and help clarify the essential roles and responsibilities among the Diabetes Care Team (DCT), which is comprised of the student living with diabetes, his or her parents/guardians, school personnel, and healthcare providers, in the care of students living with diabetes at school" (Diabetes Canada, 2014, para. 1). The four goals of the guidelines are:

1. To enhance the health, safety, emotional well-being and participation of each student with diabetes by providing information and guidance to the DCT regarding the student's diabetes management.
2. To protect students with diabetes from stigma and discrimination by promoting a positive, caring, and inclusive learning environment through enhanced communication, education, and cooperation between all members of the DCT.
3. To promote a positive sense of self and belonging and help each student with diabetes to feel empowered to manage their diabetes effectively during school hours.
4. To ensure each student with diabetes is not excluded from any school activities because of diabetes, unless indicated otherwise in the student's Individual Care Plan (ICP). (Diabetes Canada, 2014, para. 2).

Based on these goals, Diabetes Canada outlined the roles and responsibilities for parents/guardians, students, and school personnel that expand across three key areas: communication and education, daily management, and physical, sports, and extracurricular activities. The CDA recommends that all school boards have a T1D management policy in place and that all school boards adhere to the guidelines.

In 2016, the Canadian Paediatric Society (CPS) examined how each Canadian province and territory was addressing the needs of students with T1D. None of the provinces or territories received a rating of excellent. The provinces of British Columbia, Quebec, and Prince Edward Island received a rating of good, which indicates that they had a policy pertaining to the management of students with T1D that were consistent with the recommendations of the CPS, Diabetes Canada, and the Canadian Paediatric Endocrine Group (CPEG), including the development of an Individual Care Plan (ICP), and providing training to personnel to assist students with daily management, including the administration of insulin and glucagon. Since Saskatchewan, Alberta, and all three territories had no T1D guidelines in place they each received a rating of poor. The remaining provinces, including Ontario, received a rating of fair, as they did have T1D guidelines in place, that pertained to the management of hypoglycemia, support for blood glucose checks, and emergency plans. However, the policies lacked some components recommended by the CPS, CPEG, and Diabetes Canada, and did not provide for the administration of insulin while in school. Overall, CPS concluded that policies need to be available and implemented in all school boards to ensure the safety of students with T1D. Without such policies, ethics of care and the quality of life of students with T1D are at risk.

Despite significant attempts at policy interventions that have been designed to offer flexible and in-

dividual support plans for students with chronic illness, implementation of the policy remains inefficient and poorly communicated (Hopkins, Green, John, Edwards, & Wong, 2014). Although school boards may have policies in place, the policies may not be properly implemented. Therefore, this research examines the policies surrounding T1D currently in place in Catholic school boards in Ontario to determine: (a) whether the policies in place appear to serve their intended purpose; and (b) whether there are more effective procedures that need to be included within the policies. To make this determination, Ontario Catholic School Boards' policies pertaining to T1D will be compared with the Guidelines for the Care of Students Living with Diabetes at School as outlined by Diabetes Canada. Catholic school boards were chosen because both authors have experience teaching in Catholic schools and have lived-experience with T1D within Catholic schools. In addition, Catholic school boards were chosen for this study because in Catholicism there are seven heavenly virtues; one of these virtues is compassion and in Catholicism this means, "a desire for a new and better life for the sufferer and a willingness to share his pain" (Demarco, 2000, para. 3). With Catholic schools promoting the importance of this virtue within their schools, compassion should be evident in the way all individuals are treated. Thus, Catholic schools should have the resources needed and available in order to meet the needs of all students with T1D, and school personnel should express a desire for a better life and educational experience for these students.

Methodology

A policy analysis was utilized in this study. For the purpose of this investigation, a policy analysis was defined as "the actions taken to determine whether a specific policy is effective. For this process, research is employed to determine the problem, goal and alternatives to alleviate the problem" (Frey, 2011, p. 1). As a policy analysis is defined by the objects of study rather than by a theory or method of inquiry, it does not have an epistemology or methodology of its own (Einbinder, 2010). Therefore Bardach's (2012) Eightfold Path for policy analysis was used, which consists of eight non-linear steps:

Step One - Define the Problem

Bardach (2012) argues that defining the problem is essential for understanding why policy analysis is necessary and provides direction for gathering the evidence. Although CPS examined how each Canadian province and territory was addressing the needs of students with T1D, it is unclear whether individual school boards have policies in place to address T1D. Therefore, the policy analysis examined whether Ontario Catholic school boards have sufficient policies in place to address the needs of students with T1D.

Step Two – Assembly of Evidence

Of the 29 Catholic district school boards across the province of Ontario, 15 were selected to participate in this study. The 15 school boards were selected based on (a) their location within the province using the 2011 Ontario Census divisions (north, south, central, east, and west), and (b) on the school boards' total student population (small, medium, and large). Based on the total student population, the smallest school board and the largest school board from each location were selected, as well as one school board that lies in the middle. For example, in the central division, Central school board # 1 has a student population of approximately 93,000 students—the largest school board in the central division. Central school board # 3 has a student population of 14,620, which is the smallest school board in the central division. Central school board # 2 is classified as a medium school board within this division, having a student population of approximately 55,000. Once the school boards were selected, a copy of each school board's T1D policy was obtained from the school board's website. If a copy of their policy was not available online, the school board was contacted directly via email and/or telephone to request a copy. If it was discovered that no T1D policy exists, this was noted in the data. See Table 1 for a description of each school board.

Table 1
School Board Descriptions

School Board	Student Population*	Location	Has a diabetes policy
Northern Division			
Northern School Board #1	5000	Rural	No
Northern School Board #2	1500	Rural	No
Northern School Board #3	1066	Rural and Urban	No
Southern Division			
Southern School Board #1	28347	Urban	Yes
Southern School Board #2	21881	Urban	Yes
Southern School Board #3	8855	Rural	No
Central Division			
Central School Board #1	93000	Urban	No
Central School Board #2	55000	Urban	Yes
Central School Board #3	14620	Rural and Urban	No
Western Division			
Western School Board #1	81657	Urban	No
Western School Board #2	33000	Urban	Yes
Western School Board #3	4500	Rural	No
Eastern Division			
Eastern School Board #1	38800	Urban	No
Eastern School Board #2	12900	Rural	No
Eastern School Board #3	5000	Rural	No

* as stated on each school board website

Step Three – Select the Criteria

This step introduces the “evaluative standards used to judge the goodness of the projected policy outcomes that are associated with each of the alternatives” (Bardach, 2012, p. 32). The policies gathered from the 15 school boards were individually analyzed by comparing them to the Guidelines for the Care of Students Living with Diabetes at School set out by Diabetes Canada (Diabetes Canada, 2014). The Guidelines for the Care of Students Living with Diabetes at School outlines a clear set of responsibilities of a Diabetic Care Team, which includes the student living with T1D, their parents/guardians, school personnel, and health care providers. These responsibilities are meant to help guide school boards on how to best create and implement a diabetes management policy to ensure that the needs of students with T1D are being met.

Step Four – Construct Alternatives

Bardach (2012) refers to alternatives as “policy options,” “alternative courses of action,” or “alternative strategies of intervention to solve or mitigate the problem” (p. 16). In the current policy analysis, these alternatives are represented in the recommendations made to create or alter current policy in Ontario Catholic school boards pertaining to T1D, based on the guidelines presented by Diabetes Canada.

The fifth, sixth, seventh, and eighth step in Bardach’s Eightfold path of policy analysis involves the development, implementation, monitoring and evaluation of a T1D policy, and political and financial discussions. These four steps were not addressed as they were beyond the scope of the project. This de-

cision does not affect the quality of the analysis, for Bardach (2012) stipulates that the steps do not have to be followed in order, nor must all steps be followed (p. xvi).

Results

Of the 15 Catholic school boards, only four school boards had a policy specific to diabetes management: Southern school board # 1, Southern school board # 2, Central school board # 2, and Western school board # 2. This finding indicates that the majority of school boards analyzed do not have a specific policy for diabetes management. Based on the description of school boards, there are no obvious characteristics that determine whether a school board has a diabetes management policy or not. As the school boards in this study declined to provide information regarding the number of students within their board who have T1D, Statistics Canada, the Juvenile Diabetes Research Foundation, Diabetes Canada, the Ontario Ministry of Health, and the Public Health Agency of Canada were all contacted. All of the aforementioned agencies stated that no published statistics on the number of students in Ontario who have T1D exists. Therefore, it was not possible to determine if the presence of a T1D policy corresponded to the number of students with T1D enrolled in the school board. We were also unable to obtain information regarding the number of health threatening incidents that have occurred within their schools.

The four school boards that have a T1D policy in place were all in urban communities. However, location cannot be considered as a contributing factor to T1D policy implementation, as three other urban school boards and the two mixed (urban and rural) school boards did not have a T1D policy. Furthermore, it does not appear that a higher student population results in the likelihood of a school board having a policy. For example, Central school board # 2 is the only school board in its division with a policy, but it has approximately 40,000 fewer students than Central school board # 1, which does not have a policy.

Based on the information from each of the school boards analyzed, the size and location of the school do not indicate whether a school board will have a T1D policy. The school boards that do have a policy for T1D appear to have done so on their own initiative, suggesting that the development and implementation of a T1D policy is at the discretion of the individual school board rather than at the Ministry level.

CDA Guidelines for the Care of Students Living with Diabetes at School

While it is not a requirement in the province of Ontario that school boards have a diabetes policy, or that they implement the recommendations made by Diabetes Canada, the guidelines of care established by Diabetes Canada provides a standard to which the existing T1D policies may be analyzed. Diabetes Canada outlines three key areas: (1) communication and education, (2) daily management, and (3) physical, sports, and extracurricular activities.

Communication and education. In terms of communication, Diabetes Canada guidelines state that a formal communication system with all school personnel who come into contact with a student who has diabetes must be established and should include appointing at least one staff member to be a point-of-contact for the student and parent/guardian. As shown in Table 2, an examination of the T1D policies revealed that all four of the school boards' policies did not include a mandatory system of formal communication. However, the policies state that the school principal would meet with the student and parent/guardian to discuss the student's Individual Care Plan (ICP) and daily diabetes management requirements. In addition, the principal would ensure that the student's ICP would be shared or made available to all school personnel who are in contact with the student on a regular basis.

Table 2

Indication of Whether a School Board's T1D Policy Matches Diabetes Canada's Communication and Education Recommendations.

Diabetes Canada Communication and Education Recommendations	Western School Board # 2	Southern School Board # 1	Southern School Board # 2	Central School Board # 2
Participate in annual diabetes education, training and resource review to learn or to be reminded of how to manage diabetes. The student's parent/ guardian, diabetes education team and/or other trained healthcare providers could be invited to participate.	No	Yes	Yes	Only staff in direct contact with the student who has T1D
Establish a formal communication system with all school personnel who come into contact with the student with diabetes. This should include appointing at least one staff member to be a point-of-contact for the student and parent/guardian.	No	No	No	No
Identify the student with diabetes to all school personnel, including volunteers, substitute teachers, student teachers, and support staff. With permission from the student and parent/guardian, some schools may choose to display identifying information in the staff room or office and/or have emergency information folders made available to all personnel. These folders should contain the student's ICP, information about diabetes, as well as information specific to the student. Medical alert stickers can also be placed on the student's file to further identify the student.	Yes	Yes	Yes	Only staff in direct contact with the student who has T1D
Display posters identifying symptoms of hypoglycemia/hyperglycemia in key locations throughout the school.	No	No	No	No

Diabetes Canada Communication and Education Recommendations	Western School Board # 2	Southern School Board # 1	Southern School Board # 2	Central School Board # 2
Provide at least 24-hour notice whenever possible to parent/guardian of any change in school routine or of upcoming special events.	Only when possible	Only when possible	Only when possible	Only when possible
The school principal must meet with the student and parent/guardian to discuss the student's daily diabetes management requirements and the ICP while in school.	Yes	Yes	Yes	Yes
The school principal must ensure the student's ICP is shared with or made available to all school personnel that are in contact with the student on a regular basis.	Yes	Yes	Yes	Yes

Regarding education, Diabetes Canada recommends that all staff participate in annual diabetes education, training, and resource review sessions, which would allow staff to learn or to be reminded of how to manage diabetes and implement emergency procedures. Only two of the school boards' policies (Southern school board # 1 and Southern school board # 2) state that such training is required. The Central school board # 2 stated that training would only take place for staff in direct contact with the student. Central school board #2's T1D policy encourages staff to participate in organized training offered by an outside agency, but the training is not required. Western school board # 2's T1D policy does not require any annual training. This finding is of concern, as staff members may be uneducated in terms of diabetes management and may not be prepared to implement emergency procedures for treating moderate to severe hypoglycemia or hyperglycemia. Therefore, despite having a T1D policy, the staff of the Western school board #2 appear to be unable to fully meet the needs of students with T1D. Furthermore, all of the school boards' policies stated that students with T1D will be identified to all staff, volunteers, and substitute teachers; however, Central school board # 2 policy states that only staff that are in direct contact with the student with T1D would be informed that the student has T1D.

In terms of general education, none of the school boards' T1D policies require schools to display posters that outline the symptoms of hypoglycemia/hyperglycemia in key locations around the school. Only two policies (Western School Board #2 and Central School Board #2) mandate that staff understand that hypoglycemia can affect a student's behaviour and ability to perform school-related tasks. In addition, Western School Board #2 does not require annual participation in diabetes education, training, and resource review and Central School Board #2 only requires the staff who are in direct contact with the student to participate in such educational training. Therefore, it is unclear how the staff in these two school boards will learn that T1D may affect a student's behaviour and performance abilities.

All four school boards require school principals to meet with the parent/guardian of the student with T1D to create an Individual Care Plan (ICP) and make this plan available to all staff that are in contact with this student on a regular basis. The fact that the ICP would only be available to staff who are in contact with the student on a regular basis is of concern because, should the student with T1D be away from their classroom teacher (e.g., on the playground during recess, walking down the hallway, etc.), other school staff would be unable to recognize when the student is experiencing a hyper- or hypoglycemic episode and therefore would be unable to address the student's medical needs. Since a student with T1D may not have any overt indicators of their illness, all staff must be educated in the covert symptoms of T1D and how to address those symptoms when they occur. Attending to T1D symptoms quickly and

efficiently reduces the risk of a severe hypoglycemia or hyperglycemia reaction. Overall, the policies regarding communication and education of staff are not consistent across these four school boards, and the responsibilities of school staff do not fully align with the recommendations from Diabetes Canada.

Daily management. All four of the policies permit the student or assigned trained personnel to check blood sugar levels within a clean and safe location, as well as administer insulin as needed (See Table 3). Only two of the policies (Southern Board #1 and Southern Board #2) state that the parent/guardian would be notified if blood sugar monitoring supplies need to be replenished or if the blood glucose meter was not functioning correctly.

Table 3

Indication of Whether a School Board's T1D Policy Matches Diabetes Canada's Daily Management Recommendations

Diabetes Canada Daily Management Recommendations	Western School Board # 2	Southern School Board # 1	Southern School Board # 2	Central School Board # 2
Blood Glucose (Sugar Monitoring)				
Permit the student or assigned trained personnel to check blood sugar conveniently and safely, wherever the student is located in the school or, if preferred by the student, in a private location.	Yes	Yes	Yes	Yes
Notify parent/guardian if blood sugar monitoring supplies need to be replenished or if there is a concern regarding the working order of the blood glucose meter.	No	Yes	Yes	No
Medication Administration				
Supervise the student or administer insulin and/ or diabetes medications when there is mutual agreement with the student or parent/guardian and training has been provided.	Supervise only, staff will not administer injections	Supervise only, staff will not administer injections	Supervise only, staff will not administer injections	Supervise only, staff will not administer injections
Provide each student with a convenient, clean and safe location to administer insulin and/or diabetes medications and, if preferred by the student, in a private location.	Yes	Yes	Yes	Yes
Understand that the symptoms of hypoglycemia can affect behaviour and the student's ability to perform school-related and other tasks.	Yes	No	No	Yes

Diabetes Canada Daily Management Recommendations	Western School Board # 2	Southern School Board # 1	Southern School Board # 2	Central School Board # 2
Medication Administration				
Ensure all snacks and meals are eaten on time, as indicated in the student's ICP. The student also requires adequate time to finish snacks/meals. A designated staff member may be required to ensure that the snack/meal is eaten.	No, can only encourage student to eat	No, can only encourage student to eat	No, can only encourage student to eat	No
Treat hypoglycemia anywhere, at anytime, and during any activity immediately with available fast acting glucose.	Yes	Yes	Yes	Yes
Provide safe and readily accessible storage of the student's emergency snack supply.	Yes	Yes	Yes	Yes
A readily available snack and supply of fast-acting glucose should be situated in several locations throughout the school. Ensure student has a source of fast-acting glucose with them at all times.	Yes	Yes	Yes	Yes
Ensure the student is not left alone following the treatment of hypoglycemia until their blood sugar level has increased and is stabilized as indicated in the student's ICP.	Yes	Yes	Yes	No
Ensure the student has adequate time to treat hypoglycemia prior to participating in any school activities as indicated in the student's ICP.	Yes	Yes	Yes	Yes
Notify parent/guardian when treatment of mild to moderate hypoglycemia was required.	Only if it takes longer than 15 min. to recover	No	No	Establish a communication plan
Severe Hypoglycemia				
Call 911 immediately and notify parent/guardian.	Yes	Yes	Yes	Yes
Never give food or drink to a student who is unconscious or otherwise unable to swallow!	Yes	Yes	Yes	Yes

Diabetes Canada Daily Management Recommendations	Western School Board # 2	Southern School Board # 1	Southern School Board # 2	Central School Board # 2
Severe Hypoglycemia				
Ensure at least two designated staff are trained to administer glucagon.	No	No	No	No
Safely store a readily accessible supply of glucagon.	No	No	No	No
Notify parent/guardian when glucagon kit is near expiry date.	No	No	No	No
Administer glucagon according to instructions in the student's ICP.	No	No	No	No
Hyperglycemia				
Notify parent/guardian if the student has consistently high blood sugar levels according to the student's ICP.	Yes	No	No	Yes
Discuss the treatment of hyperglycemia with the parents/guardians.	Yes	No	No	Yes
Provide opportunities for the student to deal with the symptoms as necessary, including access to the washroom or to drink water more frequently.	Yes	Yes	Yes	Yes
Additional blood sugar checking, as well as ketone checking, may be required. Permit the student to check blood sugar and ketones conveniently and safely, wherever he or she is located in the school or in a private location according to the student's ICP.	Yes, but states no responsibility for student's ketone testing procedures	Yes	No	Yes
Administer supplemental insulin according to the student's ICP.	No	No	No	No
Understand that the symptoms of hyperglycemia can affect behaviour and the student's ability to perform school-related and other tasks.	Yes	Yes	No	Yes

Diabetes Canada Daily Management Recommendations	Western School Board # 2	Southern School Board # 1	Southern School Board # 2	Central School Board # 2
Severe Hyperglycemia				
Notify parent/guardian if the student is unable to eat or vomits at school or shows signs of illness.	Yes	Yes	Yes	Yes
If the student vomits and parent/guardian is unavailable, call 911 immediately or take action according to the student's ICP.	Yes	Yes	Yes	Yes
Nutrition/ Food				
Ensure all meals and snacks are eaten completely and on time. Provide sufficient time for the student to finish snacks/meals.	Encourage student to eat, but not ensure	Yes	Encourage student to eat, but not ensure	No
In the case of younger students, provide supervision to ensure entire meal/snack is consumed.	No	No	No	No
Communicate to parent/guardian situations where food was not eaten or where there were changes to planned food intake due to school-related activities.	Will only contact if there changes to planned food intake due to school-related activities.	Yes	Will only contact if there changes to planned food intake due to school-related activities.	Will only contact if there changes to planned food intake due to school-related activities.

When it comes to nutrition and eating habits, Diabetes Canada recommends that staff ensure the student with T1D eats on time, eats all of their food, and notifies the parent/guardian if there is a change of routine, or if the student does not eat everything. All four of the T1D policies follow Diabetes Canada's recommendation that staff must ensure that students are provided with sufficient time to eat all meals and snacks. However, only the Southern School Board #1 and the Central School Board #2's policies follow Diabetes Canada's recommendation that staff must ensure that all meals and snacks are eaten completely and on time, while the remaining two policies state that students will be "encouraged" to eat. In the case of young students, none of the policies stated that supervision would be provided to ensure that the young students are consuming their meal/snack. Only Southern School Board #1 will contact the parent/guardian if the student does not eat their meal/snack. However, all of the policies stated that they would inform the parent/guardian if school-related activities will interfere with the student's ability to consume a meal or snack.

That fact that parents/guardians will not be notified if the student does not eat their meal/snack is a concern. Parents/guardians should be notified if the student with T1D did not eat their snack or lunch, because the student's blood sugar may drop drastically if they have already taken their insulin. This misstep may lead to severe hypoglycemia and the need for emergency action through the injection of glucagon to raise the student's blood sugar quickly.

To treat hypoglycemia, all four policies state that a readily available snack and supply of fast-acting glucose should be available to the student at all times. However, all four policies also state that staff can only encourage students to eat the food, and the policies do not state that staff must notify the parent/guardian when food is not eaten, which is inconsistent with the guidelines set by Diabetes Canada. Should the student require treatment for hypoglycemia, all four policies state that the student would not

be left alone until their blood sugar level has increased and stabilized. However, two school board policies do not require schools to notify the parent/guardian if the student was treated for mild or moderate hypoglycemia. Western School Board #2 only required the notification of the parent/guardian if the student took longer than 15 minutes to recover and Central School Board #2 stated that the requirement to notify the parent/guardian would be addressed within the school's communication plan.

With regard to administration of medication, all four policies stated that when a student requires a T1D related medical procedure, school staff members are not to assist the student in checking the student's blood glucose levels, administer their insulin, or check for ketones. The school staff is only able to supervise.

Only the Western School Board #2 and the Central School Board #2 T1D policies state that the parent/guardian will be notified if the student has consistently high blood sugar levels and will discuss the treatment of hyperglycemia with the parent/guardian. All four school boards' T1D policies state that the student will be permitted to attend to their symptoms of hyperglycemia, including access to the wash-room and drinking water more frequently. Only the Southern School Board #2's policy did not specifically address ketone checking and did not specify that a student's behaviour and academic performance may be affected by hyperglycemia. As with hypoglycemia, all four of the policies prohibited staff from administering supplemental insulin. In the case of severe hyperglycemia, all four policies state that the parent/guardian will be notified if the student is unable to eat, vomits, or shows signs of illness. In addition, if the student vomits and the parent/guardian is unavailable, the school will call 911 immediately or follow the protocol outlined in the students' ICP.

Physical activity, sports, and extra-curricular activities. Diabetes Canada recommends that school personnel inform the parent/guardian of any upcoming extracurricular activity so that plans can be made around diabetes management. Physical activity may affect a student's blood sugar, so the parent/guardian may wish to send extra food or fast acting sugar supplies on the day of the extracurricular activity. In addition, the extracurricular activity may affect the amount of insulin the student should receive during the day. As indicated in Table 4, all of the policies state that "when possible," the parent/guardian be informed of any extracurricular activities to ensure that plans are in place to address the management of the student's diabetes. However, the use of the phrase "when possible" implies that this form of communication is not a requirement nor is it essential.

Table 4
Indication of Whether a School Board's T1D Policy Matches Diabetes Canada's Physical Activity, Sports, and Extra-Curricular Activity Recommendations

Diabetes Canada physical activity, sports, and extra-curricular activities recommendations	Western School Board # 2	Southern School Board # 1	Southern School Board # 2	Central School Board # 2
Inform parent/guardian of any extracurricular activity, so that plans can be made around diabetes management.	When possible	When possible	When possible	When possible
Have a readily available supply of fast-acting glucose for treatment of low blood sugar.	Yes	Yes	Yes	Yes
Recognize that there is often a higher chance of hypoglycemia in the hours following intense physical activity and other intense activities and be alert to any signs of hypoglycemia in the student.	Yes	Yes	No	No

All four policies stated that schools should have a readily available supply of fast-acting glucose for the treatment of low blood sugar following the activity; however, only the Western School Board #2 and Southern School Board #1 policies acknowledge that physical activity increases the risk of hypoglycemia and that staff should be alert to the student displaying signs of hypoglycemia.

Discussion

Of the 29 Catholic district school boards in Ontario, 15 were contacted regarding their policies for addressing the needs of students who have T1D. Of the 15 Catholic school boards, only four school boards had a policy for T1D. These four policies were compared Diabetes Canada's Guidelines for the Care of Students Living with Diabetes at School, which outlines three key areas schools should address when caring for students with T1D: communication and education, daily management, and physical, sports, and extracurricular activities.

Past research indicates that parents and school staff are concerned about the lack of support available to students who have T1D (Mandali & Gordon, 2009; Peery, Engelk. & Swanson, 2012; Schwartz et al., 2010). Parents and teachers have voiced their concern that school personnel are inadequately educated about T1D, which may affect their ability to address diabetic emergencies (Mandali & Gordon, 2009; Peery et al., 2012; Schwartz et al., 2010). Based on the 15 Catholic school boards examined, it appears that Ontario Catholic schools are ill prepared to offer the support parents and teachers desire, particularly in the areas of educating staff about T1D and assisting students during hypoglycemic episodes. None of the school boards had a policy in place requiring the display of posters that outline the symptoms of T1D and only two out of the 15 school boards had a policy in place that required school staff to be educated about T1D and how to handle diabetic emergencies. Kucera & Sullivan (2011) argue that teachers and staff involved with students who have T1D need to understand "the symptoms of hyperglycemia and hypoglycemia, the features of effective management, and how to handle emergencies, such as severe hypoglycemia" (p. 597). As with Cunningham and Wodrich's (2012) study, it appears that that teachers and school staff in the current study may not be adequately informed about the impact T1D has on a student's academic performance. It is highly likely, therefore, that teachers and school staff are not prepared to implement the supports and accommodations students with T1D require. Mandating that school personnel receive T1D training could significantly improve the glycemic control of a student with T1D, which is directly related to the cognitive functioning and academic performance of students with T1D (Dahlquist & Källén, 2007; Cunningham & Wodrich, 2012; Kucera & Sullivan, 2011; Ryan et al. 2016; Winnick et al., 2017). Furthermore, when T1D induced emergency occurs, there is often not enough time to review the procedures or to instruct staff on how to handle the situation. Therefore, by providing teachers with the knowledge and skills required to support effective glucose management, the student may be able to participate more fully in all instructional activities and achieve their academic potential.

The policy analysis revealed that none of the 15 school boards had a policy in place that would enable staff to administer glucagon in the case of an emergency. One of the policies analyzed stated that "at the present time, Program/Policy Memorandum #81 (1984) does not prevent school staff from administering syringe injections in an emergency but, neither does it impose an obligation to do so" (Diabetes Protocol Type 1 and Type 2, 2015, p. 6). It is interesting to note that Program/Policy Memorandum #81 has not been updated since 1984. This 35-year-old policy refers to the Provision of Health Support Services in School Settings, in which there is no specific responsibility outlined, or disallowed, in terms of administering injections to students in schools (Ontario Ministry of Education, 1984). According to the policies examined, an Individual Care Plan (ICP) must be developed for students who have T1D. The ICP must state that in an emergency situation, staff is to call 911 and is not to administer any injections, thereby waving the staff and school board of any responsibility. Furthermore, parents are to sign off on their understanding of this policy when their child with T1D is enrolled in the school. The problem, however, lies in the wait time for emergency personnel to arrive at the school. Although rare, it is possible that a student with T1D could experience severe hypoglycemia while at school. Severe hypoglycemia occurs when a child's blood glucose level is so low that they become unconscious, experience seizures, and/or is unable to take glucose orally, resulting in possible brain damage or death (American Diabetes Association, 2006). The procedure for managing severe hypoglycemia was the same across all four policies: in times of emergency, when the child is unresponsive, or unconscious due to severe hypoglycemia, staff is to call 911, wait for emergency personnel to arrive, and refrain from giving food or drink to the student. None of the policies require that a supply of glucagon be safely stored and readily accessible in case of an emergency. Furthermore, all four policies state that even if glucagon is available, staff are not to administer it. This step is in contradiction with Diabetes Canada's recommendations, which recommends that at least two designated staff members be trained to administer a glucagon injection, and in times

of emergency, these staff members are to administer glucagon to the student (Diabetes Canada, 2014). Therefore, schools should have staff members who are trained in the administration of glucagon, just as schools are trained to administer epinephrine injections in the case of an anaphylactic reaction.

A possible explanation as to why school boards prohibit the injection of glucagon may be the fear of causing undo harm should the injection be administered unnecessarily. According to the American Diabetes Association (2006), the unnecessary injection of glucagon will not harm the student. While the student's blood sugar may rise drastically with the injection of unnecessary glucagon, it is much more dangerous if the student experiences severe low blood sugar without the necessitated glucagon injection (American Diabetes Association, 2006). In 2001, the Good Samaritan Act was legislated in Canada. This Act protects individuals from liability when they provide emergency first aid assistance to a person who is ill, injured, or unconscious as a result of an accident or other emergency (Good Samaritan Act, 2001, S.O. Chapter 2, s. 2(2)). Given that school personnel cannot be held liable for providing first aid to a student experiencing a T1D medical emergency, school board policies should mandate that teachers and staff be trained to provide glucagon injections. The fact that staff are educated about the signs of an allergic reaction and the administration of epinephrine via an EpiPen, a similar policy should be in place for the administration of glucagon injections.

As evidenced by the fact that 11 of the 15 school boards lacked any form of T1D policy demonstrates a need for a standardized policy in Ontario Catholic schools. The policies that do exist do not sufficiently address the management of T1D within the school setting and do not properly meet the needs of students with T1D. Therefore, it appears that these school boards are ill prepared to address the physiological, neuropsychological, and academic effects associated with T1D (Cunningham & Wodrich, 2012; Kucera & Sullivan, 2011; Winnick et al., 2017).

Policy Recommendations

In September 2018, the Ontario Ministry of Education implemented policy/program memorandum 161 (PPM 161) that requires Ontario publicly funded schools to develop and maintain a policy or policies to support students with diabetes. PPM 161 does not require school boards to develop policies that align with Diabetes Canada's Guidelines for the Care of Students Living with Diabetes at School nor does it require a standardized policy that all school boards must follow. PPM 161 does outline minimum requirements, some of which do align with Diabetes Canada guidelines. To eliminate the inconsistencies across school boards, it is recommended that the Ontario Ministry of Education develop a standardized policy be created in conjunction with Diabetes Canada and the Canadian Paediatric Society to ensure that the policy effectively meets all of the needs of students with T1D. Currently, it is up to individual school boards to create their own policies, or to decide if a policy is needed, which the findings from the current policy analysis suggest is inadequate. All schools in Ontario should have a policy pertaining to the management of T1D, and this policy should meet all the recommendations set out by Diabetes Canada, not a select few recommendations, as is the current practice.

It is further recommended that all school staff be trained in diabetes management, regardless of their interaction with students with T1D. This training should include information on the symptoms of hyperglycemia and hypoglycemia, blood glucose monitoring, ketone acidosis, and the effects of physical activity on blood glucose levels. Such training would enable staff to be aware of the impact T1D has on students, particularly when it comes to behaviour. For example, if a student with T1D is misbehaving, the teacher should examine whether the student has correctly managed their diabetes before assuming the behaviour is a separate issue. In addition, the training in diabetes management should include instructing staff in administering glucagon during instances of severe hypoglycemia.

Limitation of the Study

There are no available statistics regarding the number of students in Ontario who have T1D or the number of T1D health threatening incidents that occur within Catholic schools. While this information would help provide justification for the current study, Sabrina's Law and Ryan's Law were both implemented after students died at school due to their life-threatening illnesses.

Ryan's Law was established in 2015 to allow students with asthma to carry their inhalers with them, and allow school personnel to administer the asthma medication to the student without any preauthoriza-

tion, should they believe that the student is experiencing an asthma exacerbation. (Legislative Assembly of Ontario, 2015). This law was implemented as the result of a tragic incident on October 9, 2012, when a 12-year-old student, Ryan Gibbons of Stafforville, Ontario, was not allowed to carry his asthma medication with him, and as a result died after experiencing an asthma attack during recess. In 2003, Sabrina Shannon suffered a fatal anaphylactic reaction during her first year of high school (Sabrina's Law, n.d.). Sabrina suffered from both asthma and anaphylaxis to peanuts, dairy, and soy. She did not have her EpiPen on her, and at first believed she was experiencing an asthma attack, and, as such, treated it as such with her puffer. When this resulted in no improvement in her condition, a staff member went to retrieve Sabrina's EpiPen, but unfortunately Sabrina fell unconscious before the device could be administered. She eventually died in hospital (Smith, n.d.). After her death, Sabrina's Law was established and a more comprehensive anaphylaxis policy was implemented across Ontario, where school employees must complete required training on the proper administration of epinephrine auto injectors, and can administer the injection if they believe the student is experiencing an anaphylactic reaction (Government of Ontario, 2005). It is striking how the major advancements in chronic illness policies (i.e., asthma and anaphylaxis) have come out of tragic events. Policy development should not wait until there is a proven record of students with T1D experiencing health complications or death at school. Rather, policy development should be proactive.

Another limitation of the current study is that it only examined the policies of 15 Catholic school boards. There are over 76 school boards in Ontario consisting of 38 public secular boards (34 English boards and 4 French boards), 38 public separate boards (29 English Catholic boards, 8 French Catholic boards and 1 English Protestant board), and seven public school authorities that operate in children's treatment centres. An examination of all the school boards is required before generalizations can be made.

Through the analysis of 15 Catholic school boards across Ontario, it is disconcerting to discover that only four have policies in place specific to the management of T1D in their schools. The analysis of the four existing policies for the management of T1D reveals that there are gaps in terms of what is currently expected of school personnel when managing students with T1D, and what the CDA states school personnel should be responsible for. There are also inconsistencies between existing policies; some policies differ in the information provided to school personnel and in the requirements placed upon them in respect of students with T1D. The existing policies are severely lacking in terms of their emergency procedures in dealing with hypoglycemia. Staff are not required, or not allowed, to administer glucagon, and instead must call 911 and wait for emergency personnel, leaving students with T1D at risk. It is recommended that a standardized Ministry policy be developed that addresses the guidelines outlined by Diabetes Canada.

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