

## Classroom as the Site for Type 1 Diabetes Self-Care Activities

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### ABSTRACT

Children and adolescents with Type 1 diabetes (T1D) require bolus insulin before each meal, necessitating self-care activities including blood glucose checking to determine insulin dose (or check for hypoglycemia) and injecting insulin during school hours. Though these activities are essential for optimizing glycemic control, they are met with reluctance from parents, the child, school authorities, and sometimes peers. This requires ongoing education and support for the child, school staff, and other students, by the diabetes care team. Many problems of performing self-care activities can be greatly reduced by allowing them in the child's classroom itself, a strategy which offers several logistical, safety, psychological and social benefits. The glucometer and strips, continuous glucose monitoring device, insulin in a cool case, and hypoglycemia kit are kept in the teacher's custody, and used by the child as needed, under supervision. This normalizes diabetes and its care, obviates concealment of diabetes, enhances the child's and teacher's confidence, optimizes diabetes care by ensuring timely and consistent insulin dosing, encourages hypoglycemia prevention and management, and reduces the chances of the child being bullied. It also promotes acceptance of diabetes by peers and greater community awareness. Other places for self-care like the medical room or the toilet have disadvantages. Possible limitations of this strategy could be objections occasionally raised by some school staff, lack of privacy needed by adolescents, or bullying by classmates: issues which need proactive handling. The diabetes care team may do well to emphasize performing self-care activities in the classroom, working with school staff and parents to this end.

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Children and adolescents with Type 1 diabetes (T1D) require frequent blood glucose (BG) checks and multiple doses of insulin for managing glycemic control well. A child spends almost half the waking hours in school, where one or more meals or snacks are consumed, and varying degrees of physical activity occur. Diabetes self-care activities that include testing BG (whether by finger prick using glucometer, or by continuous glucose monitoring i.e. CGM), insulin administration, and managing emergencies like hypoglycemia and ketosis in school, are essential, and must be facilitated by the school staff.

The International Society for Pediatric & Adolescent Diabetes (ISPAD) Clinical Practice Consensus Guidelines 2022 on diabetes care in school emphasize the need to maintain normoglycemia at school to ensure proper learning and prevent acute and long-term complications of T1D [1]. For this, the Guidelines reiterate the responsibility of the school to provide care, support, supervision

and encouragement to students with diabetes. This includes permitting and assisting in/ supervising such activities by "licensed (e.g., registered nurse) and unlicensed staff (e.g., teachers, *education and special needs assistants, administrative staff*)."

Across the world, attempts are being made to increase awareness among school staff to enable children to perform diabetes self-care activities under supervision. Diabetes self-care in school can be a challenge even in well-resourced countries [2]. In under-resourced areas, many children continue to face significant difficulties in managing diabetes in school, with varying degrees of support or resistance from the school staff. In India, the National Commission for Child Rights (NCCPCR), having received several complaints of the difficulties faced by school-going children, issued a directive in March 2023 that stated it is the duty of schools to ensure proper care and required facilities for care of a child with T1D at school [3]. The directive states "A child with T1D may require checking blood glucose, injecting insulin, taking a mid-morning or mid-afternoon snack, or doing other diabetes self-care activities, as advised by a medical person. These should be permitted by the class teacher to do so during exams and otherwise also."

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However, even in reasonably optimal conditions, advice to perform self-care activities in school is met with considerable resistance and reluctance from the parents, the child, and school authorities. A study was conducted in pediatric diabetes clinics providing specialized diabetes education, in different parts of India, of the parents' assessment of the status of care of their children. About 70% of these children were attending private (fee paying) schools, and over half of the parents were of high educational status [4]. The study revealed that only 24.4% of the children with T1D were checking BG regularly at school; less than half were administering insulin; and 17.1% parents visited school daily for self-care activities. Testing and insulin administration were done in the classroom (26.2%), medical room (16.1%), staffroom (7.8%), or toilet (2.5%). School insisted on secrecy in 12.6%, excluded children with T1D from sports and excursions in 17.9%, refused permission for injecting in 4.3%, for testing in 15.9%, and for pre-activity snack in 7.6%.

As can be seen from this sample, the site for self-care activities varied, with some insisting on maintaining secrecy; most children were not provided comfortable choices. T1D care professionals are increasingly emphasizing the need to facilitate care in school. There are several advantages of performing such activities in the classroom itself, with the child permitted to keep the glucometer and strips, or CGM reader/ mobile phone, and insulin kept in a cool case, in the teacher's custody, and to use them as necessary. This approach offers several short-term and long-term benefits, in terms of logistics, safety, psychological and social advantages, and can help overcome many of the objections raised. This strategy undoubtedly requires ongoing education and support for school staff and families by the diabetes care team.

When discussing how this approach tackles commonly faced issues, the first and foremost issue is that many parents and children, particularly adolescents, try to conceal diabetes from school staff and peers, which can be dangerous. At the time of initial diagnosis, the diabetes care team should emphasize the necessity of self-care activities in school. Simultaneously emphasizing the classroom as the site for performing these activities will make it easier for the parents/ child to overcome their desire for concealment. It will also obviate the insistence of some school staff to conceal the T1D status of the child.

The logistic benefits are obvious. The tiffin break in most schools is for 15-30 minutes, during which time the children have to eat, bond and play. In this limited time, the child with T1D must also perform self-care activities. Ideally there should a gap of 5-15 minutes between taking

the rapid-acting analog insulin dose and eating; Regular (soluble) insulin requires a gap of 30 minutes or more between taking the dose and eating. The process of checking BG and taking insulin, if performed in the classroom itself, saves time and increases the likelihood of getting a few minutes gap between insulin and meal. It also becomes practical for the child on Regular insulin to check BG and take insulin one period before the break, so that there is adequate time for onset of action, and BG control is smoother. During the day (for the school dose and before lunch dose), the abdomen is perhaps the best site to inject insulin. For most young school children, it is quite easy to take this shot by just going into a corner of the room, after confirming the dose with the teacher.

Self-care activities inevitably disrupt the class routine for the child with T1D, and for others. Performing them in the classroom rather than going elsewhere in school minimizes the disruption. It is quite practical for the teacher to supervise the child in the classroom itself, ensuring fewer omissions and occasions for playing mischief. This ensures safety for the child, gives confidence to the teacher, and reassures parents about their child's safety and well-being. Since the sharps and insulin are in the teacher's custody, it ensures they are out of reach of other children, and thus keeps them safe also.

The use of CGM often requires a mobile phone for the child to read the BG values and trends, for others (e.g. parents) to access this information (via bluetooth), and for receiving alarms for low and very high BG. Schools do not permit children to have mobile phones during school hours, so the child using CGM in any case has to deposit the phone with the teacher at the beginning of the day, go to the teacher whenever the BG value has to be read, expect the teacher to get alarms and react to them, and retrieve the phone before returning home. Planning to do all self-care activities at the teacher's desk streamlines the process, with the child checking the BG and injecting insulin daily at the teacher's desk. The daily routine of these activities promotes normalization of diabetes (analogous to wearing spectacles for myopia or a hearing aid for deafness), reduces the child's embarrassment, leads to awareness and usually greater acceptance of the child's T1D among the classmates, and eventually to greater levels of awareness among schoolmates' families and the wider community. The general awareness of diabetes makes it easier to tackle other children's bullying or teasing. It invalidates the notion of diabetes being contagious or as a barrier for the child to behave like a normal person.

The healthcare team and parents can request the teacher to discuss diabetes and hypoglycemia with the entire class; thus creating awareness regarding acute

emergencies among the classmates, thereby enhancing the safety of the child for timely detection of any episode of hypoglycemia or sickness. It is easier for the teachers who supervise self-care activities to remember that they may need to give time to the child to finish tiffin, to permit a snack to avoid hypoglycemia before any unexpected activity, or to check if BG is drifting towards hypoglycemia. In general, it is recommended that in case hypoglycemia occurs, corrective actions (giving sugar, followed by a snack) should be done in situ, rather than sending the child to the medical room. This becomes easier if the teacher and classmates are already familiar with daily self-care activities under supervision.

Schools with medical rooms often insist the child go there for performing self-care activities. This means the child must go to the medical room every day, wait for the attention of the nurse, and then check BG and inject insulin. This is time-consuming, limiting the child's time to play and bond with friends, and increasing the chances of the child missing or forgetting the self-care activities. The need to visit the medical room daily also increases the perception of schoolmates and staff that the child is "unwell", which can make it difficult for them to treat the child as normal, and increase the chances of her/him being excluded from activities and discriminated against.

Other options have their own disadvantages. The child using the staff room daily interferes with the privacy of the teachers and may cause some resentment. The toilet is an unsanitary place to perform self-care activities, and suggests that there is a sense of shame associated with diabetes. During break time, the toilet is a crowded place, with many children jostling, so it is best avoided for diabetes care.

The acceptance of self-care activities by school staff

and even peers, may not be easy, with challenges likely to arise from time to time. Occasionally a teacher may refuse to cooperate, the adolescent may need privacy, or peers may bully. The child himself/herself may try to take undue advantage of his/her diabetes. Using the classroom for delivery of care may reduce and ease problems. At all times, school authorities, parents, and the diabetes care team must stay alert to hindrances and work together to overcome them, in the best interest of the child and other children.

To conclude, the diabetes care team should advise parents from the beginning to inform school authorities about diabetes, make sure they insist that the child is supported in management of T1D in school, and consider emphasizing that these self-care activities are to be performed in the classroom itself.

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