The Management of Insulin Administration and Blood Glucose Monitoring in Children with Type 1 Diabetes Mellitus: Guidelines
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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada’s health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

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Research Questions

1. What are the evidence-based guidelines regarding the management of insulin administration in children with type 1 diabetes mellitus?

2. What are the evidence-based guidelines regarding the monitoring of blood glucose in children with type 1 diabetes mellitus?

Key Findings

Three evidence-based guidelines were identified regarding the management of insulin administration and the monitoring of blood glucose in children with Type 1 diabetes mellitus.

Methods

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Filters were applied to limit the retrieval to health technology assessments, systematic reviews, and meta-analyses, and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2012 and May 10, 2017. Internet links are provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Selection Criteria</th>
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<tr>
<td><strong>Population</strong></td>
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<tr>
<td>Children with type 1 diabetes in outpatient settings (including school)</td>
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<td><strong>Intervention</strong></td>
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<tr>
<td>Q1: Guidelines regarding the management of insulin administration</td>
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<td>Q2: Guidelines regarding the monitoring of blood glucose</td>
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<tr>
<td><strong>Comparator</strong></td>
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<tr>
<td>Q1-2: No comparator</td>
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<tr>
<td><strong>Outcomes</strong></td>
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<tr>
<td>Guidelines</td>
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<tr>
<td><strong>Study Designs</strong></td>
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<tr>
<td>Health technology assessments, systematic reviews, meta-analyses, evidence-based guidelines</td>
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Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Normally, health technology assessment reports, systematic reviews, and meta-analyses are presented first; however, in reports where guidelines are primarily sought the aforementioned evidence types are presented in the appendix.

Three evidence-based guidelines were identified regarding the management of insulin administration and the monitoring of blood glucose in children with Type 1 diabetes mellitus.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Three evidence-based guidelines were identified regarding the management of insulin administration and the monitoring of blood glucose in children with Type 1 diabetes mellitus. One guideline, published by National Institute for Health and Care Excellence (NICE), recommends education and information be given to children and young people with Type 1 diabetes mellitus, with information on insulin management and blood glucose testing (including targets) included. NICE recommends that school staff receive appropriate education and should be liaised with regularly. They also recommend that the insulin therapy and management should be individualized for each child depending on their personal and family circumstances.

The second identified guideline was published by Province of British Columbia (Child Health BC), and recommends that blood glucose be monitored regularly in the school-setting, with treatment goals and strategies being tailored to each individual child. Blood glucose should be measured regularly throughout the school day and supervision should be available for students who require it. Blood glucose levels should additionally be recorded in a logbook that is kept at school and these values should be reviewed with the parent or guardian. For insulin administration, supervision should be available for students if agreed upon by the parents/caregivers, with staff who are trained in assisting and operating the individual student’s insulin delivery system. Extra and emergency insulin should be stored in the school setting in the event of natural disasters or emergencies that require the student to remain at school. It is also recommended that, in the school setting, an injection pen be used instead of a syringe if the student requires multiple daily injections of insulin.

The final guideline published by the Agency for Healthcare Research and Quality (AHRQ) recommends that, at diagnosis, outpatient care should be offered according to the clinical needs, circumstances, and wishes of the individual patient. In the case of acute intercurrent diseases, for outpatients, families and patients should be informed of the risk of hyperglycemia, ketosis, and hypoglycemia; especially the risk of hypoglycemia in children under six. They should also be informed about disease management during intercurrent disease. Insulin management should continue even if the patient cannot eat and blood glucose should continue to be monitored.
References Summarized

Guidelines and Recommendations


Appendix — Further Information

Previous CADTH Reports


Systematic Reviews and Meta-analyses


Clinical Practice Guidelines – Uncertain Methodology


11. Royal College of Physicians of Ireland, Faculty of Pediatrics [Internet]. Model of care for all children and young people with type 1 diabetes. Dublin (Ireland): Health Service Executive, National Clinical Programmes for Diabetes and Paediatrics; 2015 [cited 2017 May 23].


Review Articles


Additional References
