CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Long-Acting Insulin Analogues versus Human NPH Insulin for Adults with Type 2 Diabetes and Unresponsive to Non-insulin Therapies: Clinical Effectiveness, Cost-Effectiveness, and 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 is the comparative clinical effectiveness of long-acting insulin analogues versus human NPH insulin for the treatment of adults with type 2 diabetes who are not responding to non-insulin therapies alone?

2. What is the comparative cost-effectiveness of long-acting insulin analogues versus human NPH insulin for the treatment of adults with type 2 diabetes who are not responding to non-insulin therapies alone?

3. What are the evidence-based guidelines regarding the selection of a first-line insulin therapy for the treatment of adults with type 2 diabetes who are not responding to non-insulin therapies alone?

Key Findings

Two evidence-based guidelines were identified regarding the selection of first-line insulin therapy for the treatment of adults with type 2 diabetes who are unresponsive to non-insulin therapies. No relevant studies pertaining to the comparative clinical effectiveness and cost-effectiveness of long-lasting insulin analogues versus human NPH insulin were identified.

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. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2014 and April 20, 2019. Internet links were provided, where available.

Selection Criteria

One reviewer conducted an initial screening of titles and abstracts of citations, and a second reviewer confirmed selected studies based on the inclusion criteria presented in Table 1 and prepared the summary of abstracts.

Table 1: Selection Criteria

<table>
<thead>
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<th>Population</th>
<th>Adults with type 2 diabetes who are not responding to non-insulin therapies (i.e., DPP-4 inhibitors, GLP-1 receptor agonists, or SGLT2 inhibitors) alone in any clinical setting</th>
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</table>
| Intervention | Q1-Q2: Long-acting insulin analogues  
Q3: Long-acting insulin analogues; human NPH insulin                                                                 |
### Comparator

| Comparator | Q1-Q2: Human NPH insulin  
Q3: No comparator required |

### Outcomes

| Outcomes | Q1: Clinical effectiveness (e.g., quality of life, glycemic control, changes in weight) and safety (e.g., adverse effects, hypoglycemic events)  
Q2: Cost-effectiveness  
Q3: Evidence-based guidelines and recommendations |

### Study Designs

| Study Designs | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines |

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**Results**

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

Two evidence-based guidelines were identified regarding the selection of first-line insulin therapies for adults with type 2 diabetes who do not respond to non-insulin therapies. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies or economic studies were identified.

Additional references of potential interest are provided in the appendix.

**Overall Summary of Findings**

Two evidence-based guidelines\(^1,2\) were identified regarding the selection of first-line insulin therapies for adult patients with type 2 diabetes (T2DM) who are unresponsive to non-insulin therapies.

Diabetes Canada\(^1\) recommends those patients with T2DM who are unresponsive to non-insulin antihyperglycemic therapies should add once-daily long-acting insulin over premixed or bolus insulin to their treatment regimen. Additionally, long-acting insulin analogues are recommended over NPH insulin for reducing nocturnal and symptomatic hypoglycemia although it wasn’t stated whether this was suggested for those T2DM patients who are specifically unresponsive to non-insulin therapies.

The National Institute for Health and Care Excellence (NICE)\(^2\) recommends a variety of insulin therapies depending on a patient’s needs and severity of hypoglycemia (i.e. depending upon which non-insulin therapies have inadequately controlled hypoglycemia). However, the recommendations do not specifically state whether TD2M patients who are unresponsive to non-insulin therapies should consider long-acting insulin over human NPH insulin or vice versa.

**References Summarized**

**Health Technology Assessments**

No literature identified.
Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials
No literature identified.

Non-Randomized Studies
No literature identified.

Economic Evaluations
No literature identified.

Guidelines and Recommendations
   See: Insulin Treatment for Type 2 Diabetes Recommendations, Page 115

   See: Recommendation 64; page 20
Appendix — Further Information

Systematic Reviews

Non-Responsive to Non-Insulin Therapies Not Specified in Patient Population


Randomized Controlled Trials

Non-Responsive to Non-Insulin Therapies Not Specified in Patient Population


Non-Randomized Studies

Non-Responsive to Non-Insulin Therapies Not Specified in Patient Population


Economic Evaluations

*Non-Responsive to Non-Insulin Therapies Not Specified in Patient Population*

