



Diploma in Pharmaceutical Medicine Examination Part 2 22 October 2025 - Critical Appraisal Paper

Cost-effectiveness of GLP-1 receptor agonists versus insulin for the treatment of type 2 diabetes: a real-world study and systematic review by Yang et al

Cardiovasc Diabetol. 2021 Jan 19;20(1):21. doi: 10.1186/s12933-020-01211-4

Question 1

What are the primary objectives of the study? (1 mark)

Question 2

How does a cost-utility analysis differ from a cost-effectiveness analysis? (1 mark)

Question 3

Define the five-step study framework of this Cost-Effective Analysis. (2.5 marks)

Question 4

What data source was used for the real-world cost-effectiveness analysis? (1 mark)

Question 5

State three potential biases in the study's cohort identification process and give an example for each of how this could influence the study. (6 marks)

Question 6

Name the two clinical outcomes for which the number needed to treat (NNT) was calculated. (1 mark)



Question 7

- a) What is the incremental cost-effectiveness ratio (ICER) in the context of this study? (1 mark)
- b) How were the ICERs calculated in this analysis? (1.5 marks)
- c) How are ICERs assessed by Health Technology Assessment (HTA) bodies? (1 mark)

Question 8

- a) What is a sensitivity analysis and why does it matter? (2 marks)
- b) Give 2 strengths and 2 weaknesses of the sensitivity analyses conducted in the study? (4 marks)

Question 9

Summarise the key findings as presented in Table 1 (6 marks)

Question 10

What is meant by external adjudication and why is this important? (1 mark)

Question 10

From the third-party payer perspective, what was the base-case cost per case of hospitalised hypoglycemia prevented? (1 mark)

Question 11

- a) What does it mean to have a cost-effectiveness analysis from the payer perspective? (1 mark)
- b) Provide one benefit and one limitation of choosing the payer perspective for health economic analysis. (2 marks)
- c) What does it mean to have an analysis from a societal perspective? (1 mark)
- d) Provide one benefit and one limitation to a pharmaceutical company of generating a cost-effectiveness analysis from a societal perspective. (2 marks)



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Question 12

The study reports a higher drug acquisition cost for GLP-1RAs (e.g., US\$108.6/month) compared to insulin (e.g., US\$15.4/month). In a market where healthcare is provided through insurance, how might this affect patient adherence in a real-world setting? (1 mark)

Question 13

Provide brief explanations of three benefits and three limitations of using real world data to inform cost-effectiveness analyses. (6 marks)

Question 14

In the discussion, the authors state that the findings of this study could be generalised to countries with a universal health insurance coverage. List three potential factors that might limit this for the UK setting. (3 marks)

Question 15

Briefly describe 2 implications of the study's findings for healthcare policy and clinical practice? (2 marks)

Question 16

Give 3 types of additional data or analyses that could be useful in the broader understanding the costs and benefits of these interventions and how they compare? (3 marks)