COST-EFFECTIVENESS OF A REAL-TIME CONTINUOUS GLUCOSE MONITORING SYSTEM VERSUS SELF-MONITORING OF BLOOD GLUCOSE IN PEOPLE WITH TYPE 2 DIABETES ON INSULIN THERAPY IN THE UK

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Supplementary Appendix
CHECKLIST OF REPORTING MODEL INPUT IN DIABETES HEALTH ECONOMIC STUDIES

The following study information includes a checklist for transparency as per the Mt Hood Modelling Group recommendations. A trace of HbA1c progression over time in each comparator is also included for transparency of the cost-effectiveness analysis comparing rt-CGM to SMBG in people with T2D on insulin therapy in the United Kingdom.

| Model Input                                                      | Checkbox | Comments                  |
|-----------------------------------------------------------------|----------|---------------------------|
| Simulation cohort                                               |          |                           |
| Baseline age                                                    | ☒        | Table 1, page 11          |
| Ethnicity/race                                                  | ☒        | Table 1, page 11          |
| BMI/weight                                                      | ☒        | Table 1, page 11          |
| Duration of Diabetes                                            | ☒        | Table 1, page 11          |
| Baseline HbA1c, lipids, and blood pressure                      | ☒        | Table 1, page 11          |
| Smoking status                                                  | ☒        | Table 1, page 11          |
| Comorbidities                                                   | ☒        | Table 1, page 11          |
| Physical activity                                               |          | Not included in the study design |
| Baseline treatment                                              | ☒        | Introduction, page 2      |
| Treatment intervention                                          |          |                           |
| Type of treatment                                               | ☒        | Introduction, page 5      |
| Treatment algorithm for HbA1c over time                         | ☒        | Appendix, Table 2         |
| Treatment algorithm for other conditions                        | ☒        | Appendix, Table 2         |
| Treatment initial effects on baseline HbA1c                    | ☒        | Appendix, figure 1        |
| Rules for treatment intensification                             | ☒        | Appendix, Table 2         |
Long-term effects (adverse effects, treatment adherence and persistence, and residual effects after discontinuation of treatment)

Trajectory of HbA1c

Differentiated by acute event in first and subsequent years

Cost of intervention and other costs (e.g., managing complications, adverse events and diagnostics)

Unit price and resource use separately and give information on discount rates applied

Health state utilities

Operational mechanics of the assignment of utility values

Management of multi-health conditions

General model characteristics

Choice of mortality table and any specific event-related mortality

Choice and source of risk equations

Long-term diabetes complications, hypoglycaemia and hyperglycaemia event costs: Table 4

Appendix, figure 1

Methods, page 6 and Table 4, page 23

Appendix, Table 1

Table 1, page 11

Table 4, page 23

Table 1, page 11

Table 4, page 23

Methods, page 7

Methods, page 7 and Table 3, page 22

CDM defaults and risk equations

Appendix, Table 1

Appendix, Table 1
IMPACT INVENTORY

The Impact Inventory from the 2nd Panel on Cost-effectiveness in Health and Medicine has been included here for clarification on the impacts and components included in the cost-effectiveness analyses.²

| Sector                                   | Type of Impact                                                                 | Included in This Reference Case Analysis from NHS Perspective | Notes on Sources of Evidence                                                                 |
|------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Formal Health Care Sector                |                                                                               |                                                                | Lifeline effects from the CORE diabetes model                                               |
| Health                                   | Health outcomes (effects)                                                      | ■                                                             | Benefit of avoiding fingerstick use                                                           |
|                                          | Longevity effects                                                             | ■                                                             | Benefit of avoiding acute and chronic diabetes-related complications                         |
|                                          | Health-related quality-of-life effects                                       | ■                                                             |                                                                                               |
|                                          | Other health effects (eg, adverse events and secondary transmissions of infections) | ■                                                             |                                                                                               |
|                                          | Medical costs                                                                 | ■                                                             | NHS                                                                                            |
|                                          | Paid for by third-party payers                                               | ■                                                             | Future costs and clinical outcomes were discounted at 3.5% per annum                       |
|                                          | Paid for by patients out-of-pocket                                           | □                                                             |                                                                                               |
|                                          | Future related medical costs (payers and patients)                           | □                                                             |                                                                                               |
|                                          | Future unrelated medical costs (payers and patients)                          | □                                                             |                                                                                               |
| Informal Health Care Sector              |                                                                               |                                                                |                                                                                               |
| Health                                   | Patient-time costs                                                           | N/A                                                           |                                                                                               |
|                                          | Unpaid caregiver-time costs                                                  | N/A                                                           |                                                                                               |
|                                          | Transportation costs                                                         | N/A                                                           |                                                                                               |
| Non-Health Care Sectors (with examples of possible items) | Productivity                                                               |                                                                |                                                                                               |
|                                          | Labor market earnings lost                                                   | N/A                                                           |                                                                                               |
|                                          | Cost of unpaid lost productivity due to illness                              | N/A                                                           |                                                                                               |
|                                          | Cost of uncompensated household production                                  | N/A                                                           |                                                                                               |
|                                          | Consumption                                                                  |                                                                |                                                                                               |
|                                          | Future consumption unrelated to health                                       | N/A                                                           |                                                                                               |
|                                          | Social Services                                                              |                                                                |                                                                                               |
|                                          | Cost of social services as part of intervention                             | N/A                                                           |                                                                                               |
|                                          | Legal or Criminal Justice                                                    |                                                                |                                                                                               |
|                                          | Number of crimes related to intervention                                     | N/A                                                           |                                                                                               |
|                                          | Cost of crimes related to intervention                                       | N/A                                                           |                                                                                               |
| Category          | Impact Description                                                                 | N/A | □ |
|-------------------|--------------------------------------------------------------------------------------|-----|---|
| Education         | Impact of intervention on educational achievement of population                      | N/A |   |
| Housing           | Cost of intervention on home improvements (e.g., removing lead paint)                | N/A |   |
| Environment       | Production of toxic waste pollution by intervention                                  | N/A |   |
| Other (specify)   | Other impacts                                                                        | N/A |   |

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| Topic                        | No. | Item                                                                 | Location where item is reported                             |
|------------------------------|-----|----------------------------------------------------------------------|-------------------------------------------------------------|
| **Title**                    | 1   | Identify the study as an economic evaluation and specify the interventions being compared. | Title                                                       |
| Abstract                     | 2   | Provide a structured summary that highlights context, key methods, results, and alternative analyses. | Abstract                                                    |
| Introduction                 | 3   | Give the context for the study, the study question, and its practical relevance for decision making in policy or practice. | Introduction                                                |
| **Methods**                  |     |                                                                      |                                                             |
| Health economic analysis plan| 4   | Indicate whether a health economic analysis plan was developed and where available. | Methods, First Paragraph, "Model Structure"                |
| Study population             | 5   | Describe characteristics of the study population (such as age range, demographics, socioeconomic, or clinical characteristics). | Methods, Second Paragraph, "Simulation cohort and treatment effects" and Table 1 |
| Setting and location         | 6   | Provide relevant contextual information that may influence findings. | Not reported                                                |
| Comparators                  | 7   | Describe the interventions or strategies being compared and why chosen. | Introduction: Fifth paragraph, Methods: "Costs and Utilities" |
| Perspective                  | 8   | State the perspective(s) adopted by the study and why chosen.       | Methods: "Time horizon, perspective and discount rate"      |
| Time horizon                 | 9   | State the time horizon for the study and why appropriate.            | Methods: "Time horizon, perspective and discount rate"      |
| Topic                                      | No. | Item                                                                 | Location where item is reported                                      |
|-------------------------------------------|-----|----------------------------------------------------------------------|---------------------------------------------------------------------|
| Discount rate                             | 10  | Report the discount rate(s) and reason chosen.                       | Methods: “Time horizon, perspective and discount rate”              |
| Selection of outcomes                     | 11  | Describe what outcomes were used as the measure(s) of benefit(s) and harm(s). | Methods: "Model Structure"                                         |
| Measurement of outcomes                   | 12  | Describe how outcomes used to capture benefit(s) and harm(s) were measured. | Methods: “Costs and Utilities”, Second paragraph                    |
| Valuation of outcomes                     | 13  | Describe the population and methods used to measure and value outcomes. | Methods: “Costs and Utilities”, Second paragraph, Table 3           |
| Measurement and valuation of resources and costs | 14  | Describe how costs were valued.                                      | Methods: “Costs and Utilities”, First and Second paragraph, Table 2 |
| Currency, price date, and conversion      | 15  | Report the dates of the estimated resource quantities and unit costs, plus the currency and year of conversion. | Methods: “Costs and Utilities”, First paragraph                     |
| Rationale and description of model        | 16  | If modelling is used, describe in detail and why used. Report if the model is publicly available and where it can be accessed. | Methods: "Model Structure"                                         |
| Analytics and assumptions                 | 17  | Describe any methods for analysing or statistically transforming data, any extrapolation methods, and approaches for validating any model used. | Methods: "Model Structure"                                         |
| Characterising heterogeneity              | 18  | Describe any methods used for estimating how the results of the study vary for subgroups. | Methods: “Sensitivity analysis”, Second paragraph                  |
| Characterising distributional effects     | 19  | Describe how impacts are distributed across different individuals or adjustments made to reflect priority populations. | Methods: “Sensitivity analysis”, Second paragraph                  |
| Characterising uncertainty                | 20  | Describe methods to characterise any sources of uncertainty in the analysis. | Methods: “Sensitivity analysis”                                     |
| Topic                                                   | No. | Item                                                                 | Location where item is reported |
|---------------------------------------------------------|-----|----------------------------------------------------------------------|---------------------------------|
| Approach to engagement with patients and others         | 21  | Describe any approaches to engage patients or service recipients, the | Not reported                    |
| affected by the study                                   |     | general public, communities, or stakeholders (such as clinicians or  |                                 |
|                                                         |     | payers) in the design of the study.                                   |                                 |
| Results                                                 |     |                                                                      |                                 |
| Study parameters                                        | 22  | Report all analytic inputs (such as values, ranges, references)      | Tables 1, 2 and 3               |
|                                                         |     | including uncertainty or distributional assumptions.                 |                                 |
| Summary of main results                                 | 23  | Report the mean values for the main categories of costs and outcomes  | Results: “Base case analysis”,  |
|                                                         |     | of interest and summarise them in the most appropriate overall     | Table 4                        |
| Effect of uncertainty                                   | 24  | Describe how uncertainty about analytic judgments, inputs, or        | Results: “Sensitivity analysis”,|
|                                                         |     | projections affect findings. Report the effect of choice of discount  | Table 5                        |
|                                                         |     | rate and time horizon, if applicable.                                 |                                 |
| Effect of engagement with patients and others           | 25  | Report on any difference patient/service recipient, general          | Not reported                    |
| affected by the study                                   |     | public, community, or stakeholder involvement made to the approach or|                                 |
|                                                         |     | findings of the study                                                |                                 |
| Discussion                                              |     |                                                                      |                                 |
| Study findings, limitations,                            | 26  | Report key findings, limitations, ethical or equity considerations    | Discussion: First to Fourth     |
| generalisability, and current knowledge                 |     | not captured, and how these could affect patients, policy, or        | paragraph                       |
|                                                         |     | practice.                                                            |                                 |
| Other relevant information                              |     |                                                                      |                                 |
| Source of funding                                       | 27  | Describe how the study was funded and any role of the funder in the   | Acknowledgements: “Funding”     |
|                                                         |     | identification, design, conduct, and reporting of the analysis       |                                 |
| Conflicts of interest                                   | 28  | Report authors conflicts of interest according to journal or          | Acknowledgements: “Conflict of |
|                                                         |     | International Committee of Medical Journal Editors requirements.      | interest”                       |
### Supplementary Table 1  General Model Characteristics

| Algorithm                  | Description                                                                 |
|----------------------------|-----------------------------------------------------------------------------|
| Mortality rate             | Combined UKPDS 68\(^4\)                                                    |
| Risk equations             | 1. Myocardial infarction: UKPDS Outcomes Model Version 2                    |
|                            | 2. Stroke: UKPDS Outcomes Model Version 2                                    |
|                            | 3. Angina: UKPDS Outcomes Model Version 2                                    |
|                            | 4. Heart failure: UKPDS Outcomes Model Version 2                             |
| Model uncertainty          | 1. UKPDS 68 used for T2D specific health state transition probabilities.     |
|                            | 2. Probabilistic sensitivity analysis specified with Monte Carlo 2\(^{nd}\) order sampling, with 1000 patients and 1000 bootstrap iterations. |

T2D, type 2 diabetes; UKPDS, UK Prospective Diabetes Study.

### Supplementary Table 2  Treatment Algorithms

| Algorithm/Characteristic   | Description                                                                 |
|----------------------------|-----------------------------------------------------------------------------|
| HbA1c evolution overtime  | Clinical Tables: Index 0; yearly progression 0.15\(^{\ast}\)               |
| Initial treatment effect HbA1c | 0.56\% reduction in HbA1c for rt-CGM after 12 months follow-up (based on mean adjusted difference between rt-CGM and SMBG groups) |
| Rules for treatment intensification (HbA1c cut-off) | Restrict to HbA1c values lower than 7.0\% points |
| Switch treatment when HbA1c critical threshold is exceeded | Change treatment at HbA1c critical threshold of 12.0\% points |

HbA1c, glycated hemoglobin; rt-CGM, real-time continuous glucose monitoring.

\(^{\ast}\)The yearly progression of 0.15 HbA1c units is based on the clinical tables setting in the CORE diabetes model indexed over the duration of diabetes. The clinical tables are derived from results of the of the Diabetes Control and Complications Trial (DCCT) and the Epidemiology of Diabetes Interventions and Complications study (EDIC; 1994 to present). The EDIC study represents the observational follow-up study from the DCCT.
## Supplementary Table 3  
### Annual Costs for rt-CGM and SMBG in type 2 Diabetes in the UK

|                          | Unit cost (GBP) | Units | Net cost (GBP) |
|--------------------------|-----------------|-------|----------------|
| rt-CGM annual cost       |                 |       |                |
| rt-CGM annual costs were based current U.K. prices and assumed an annual usage of 36 sensors and 4 transmitters.⁵ | 1,250 | 1   | 1,250          |
| SMBG annual cost         |                 |       |                |
| Annual costs of strips and lancets were derived from published sources.⁶,⁷ Utilization of 3.8 times per day was sourced from DIAMOND for type 2 patients on insulin.⁸ | 0.2897 per test | 1,387 | 401.81         |

GBP, Great British pound; rt-CGM, real-time continuous glucose monitoring; SMBG, self-monitoring of blood glucose
HbA1c: glycated hemoglobin; rt-CGM: real-time glucose monitoring; SMBG: self-monitoring of blood glucose.
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