

**University of Sheffield**



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**The Cost-Effectiveness of Long-Acting  
Insulin Analogue, Insulin Glargine**

**Addendum to Assessment Report**

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## **Insulin Glargine addendum**

Following the submission of the assessment report, amendments have been made to the cost-effectiveness model of Insulin Glargine to take account of the comments from consultees. New evidence was provided in the comments from the consultees (mainly Aventis) which lead SchARR to amend the cost-effectiveness model of insulin glargine in time for the first Appraisal Committee meeting.

### **New drug price**

New data relating to the drug price of insulin glargine was included in the comments from Aventis. In the original assessment report, the annual cost are insulin glargine in type I patients was £237 and the annual cost of insulin glargine in type II was £380. These drug prices were reported in the Aventis submission.

Aventis have since confirmed that the launch price to the NHS will be lower than those reported in their original submission. Aventis' response to the SchARR assessment report suggests that the price of insulin glargine is as follows:

	Annual cost of insulin glargine	
	Type I	Type II
Vials	£203	£325
Cartridges	£231	£369
Pens	£237	£380

The SchARR model has been amended to account of these new drug prices.

### **Utility per hypoglycaemic event avoided**

In the original assessment report, the utility gained per hypoglycaemic event avoided was 0.19%. This figure was taken from correspondence with Aventis regarding regression analysis on the utility dataset.

Aventis have since re-analysed the dataset on which this value is based. This re-analysis suggests that the utility gained per hypoglycaemic event is 0.52%. The SchHARR model has been amended to account for this new evidence.

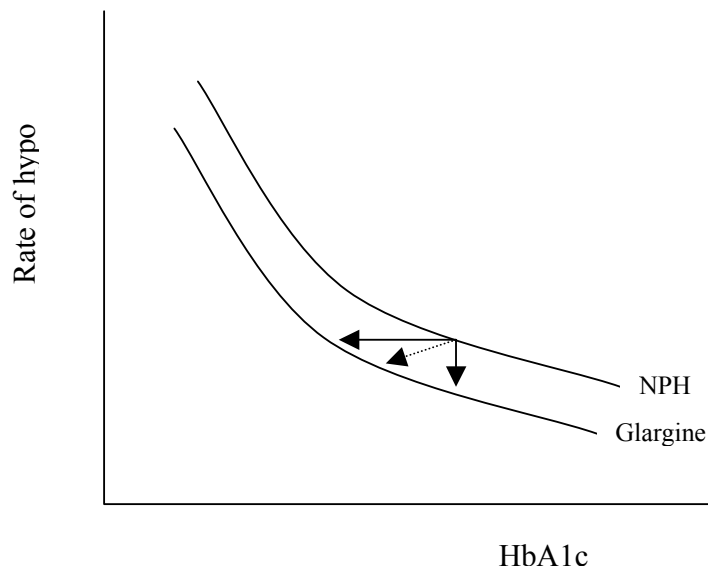
### **The cost of a severe hypoglycaemic event**

In the original assessment report, the cost of a severe hypoglycaemic event was £62. Data from the DARTS/MEMO study suggests that the cost of a severe hypoglycaemic event is, in fact, £218. The SchHARR model has been amended to take account of this DARTS/MEMO data.

### **Relationship between glycaemic control and hypoglycaemia**

The model was also amended to examine the relationship between glycaemic control and the incidence of hypoglycaemia. Two additional analyses were performed to determine the effect of this relationship on the cost per QALY ratio on insulin glargine.

Figure 1: The relationship between glycaemic control and hypoglycaemia



The first analysis determines the effect on the cost-effectiveness of holding glycaemic control constant and reducing the incidence of hypoglycaemic events. In type I patients, results from

the Ratner trial<sup>1</sup> were used to represent a scenario in which insulin glargine has no additional effect on Hba1c control but significantly reduces the incidence of hypoglycaemic events (42% reduction compared to NPH).

In type II patients, results from the HOE 4002 trial<sup>2</sup> were used to represent a scenario in which insulin glargine has no additional effect on Hba1c control but significantly reduces the incidence of hypoglycaemic events (18.84% reduction compared to NPH).

The second analysis determines the effect on the cost-effectiveness of holding the incidence of hypoglycaemic events constant and improving glycaemic control. In both type I and type II patients, results from the Pieber trial<sup>3</sup> were used to represent a scenario in which insulin glargine does not significantly reduce the incidence of hypoglycaemic events but has additional benefit on Hba1c control (0.14% reduction in HbA1c compared to NPH). The Pieber study was used in type II patients due to a lack of other data. By using the Pieber data, the model assumes that the effect of insulin glargine on HbA1c control is the same in type I and type II patients.

#### **New cost-effectiveness ratio**

The cost effectiveness model for insulin glargine has been amended to take account of the new drug price, £218.34 as the cost of a severe hypoglycaemic event and 0.0052 utils gained per hypoglycaemic event avoided. The cost-effectiveness is minimised if HbA1c control is held constant and the maximum reduction in the incidence of hypoglycaemic events is modelled, as shown in the following table.

Table 1: Minimized cost per QALY ratio

Minimized cost per QALY	Type 1	Type 2
Vial	£3,496	£32,508
Cartridge	£4,628	£41,236
Pen	£4,978	£43,411

Table 2 and Table 3 show the cost per QALY ratios for type I and type II patients respectively.

Table 2: Cost per QALY ratio for type I patients

Type 1	% reduction in Hba1c	% reduction in hypos	No. of avoided hypos	utility from avoided hypos	C/E
Vials	0	42	15	7.70%	£3,496
	0.07	21	7.5	3.90%	£5,935
	0.14	0	-	-	£16,011
Cartridges	0	42	15	7.70%	£4,682
	0.07	21	7.5	3.90%	£8,012
	0.14	0	-	-	£21,772
Pens	0	42	15	7.70%	£4,978
	0.07	21	7.5	3.90%	£8,530
	0.14	0	-	-	£23,207

Table 3: Cost per QALY ratio for type II patients

Type 2	% reduction in Hba1c	% reduction in hypos	No. of avoided hypos	utility from avoided hypos	C/E
Vials	0	18.84	3	1.60%	£32,508
	0.07	9.4	1.5	0.8%	£44,755
	0.14	0	-	-	£71,978
Cartridges	0	18.84	3	1.60%	£41,236
	0.07	9.4	1.5	0.8%	£56,789
	0.14	0	-	-	£91,362
Pens	0	18.84	3	1.60%	£43,411
	0.07	9.4	1.5	0.8%	£59,787
	0.14	0	-	-	£96,192

## References

1. Ratner, R. E., Hirsch, I. B., Neifing, J. L., Garg, S. K., Mecca, T. E., Wilson, C. A., and [Anon] Less hypoglycemia with insulin glargine in intensive insulin therapy for type 1 diabetes. U.S. Study Group of Insulin Glargine in Type 1 Diabetes. [see comments]. *Diabetes Care* 2000; **23** 639-643.
2. Aventis Submission to the National Institute of Clinical Excellence on the Clinical and Cost-Effectiveness of Insulin Glargine (Lantus) for Type 1 and 2 Diabetes compared with Other Long and Intermediate Acting Insulin Preparations and Insulin Pump Therapy. 2002;
3. Pieber, T. R., Eugene-Jolchine, I., Derobert, E., and [Anon] Efficacy and safety of HOE 901 versus NPH insulin in patients with type 1 diabetes. The European Study Group of HOE 901 in type 1 diabetes. *Diabetes Care* 2000; **23** 157-162.