Supplemental Figure 1.

$$\frac{T_{max}}{CMR_{gl}} = \frac{V_d + \frac{\Delta_i}{\Delta_o}}{V_d - \frac{\Delta_i}{\Delta_o}}$$

$$G_i = G_o \frac{\Delta_i}{\Delta_o} - \frac{1}{2} K_T \left(V_d - \frac{\Delta_i}{\Delta_o} \right)$$

Using a previously published reversible Michaelis-Menten model for glucose transport across the human blood-brain barrier (6, 29), it is possible to use our data to derive some estimates of the ratio of maximum rate of blood-brain glucose transport to brain glucose consumption and then, baseline brain glucose levels from our data. G_i is the calculated brain glucose level, G_o is the plasma glucose level, K_T is the Michaelis-Menten half-saturation constant, with a value of 0.6 mM (6) or 1.1 mM (29), T_{max} is the maximum rate of blood-brain glucose transport, CMR_{gl} is the brain glucose utilization rate, V_d is the brain water space (30), and Δ_i is the difference between the steady-state brain glucose concentration during the infusion and baseline, and Δ_o is the analogous difference for the plasma glucose.

Supplemental Table 1. Calculated $T_{max}/CMR_{glucose}$ using previously published reversible Michaelis-Menten models. ANOVA followed by Fisher's least significant difference (LSD) test for pairwise comparisons, data expressed as mean ± SEM

				P value			
	Lean	**Obese**	**T2DM**	**ANOVA**	**Lean vs Obese**	**Lean vs T2DM**	**Obese vs T2DM**
$\frac{T_{max}}{CMR_{gl}}$	1.74 ± 0.1	1.49 ± 0.03	1.40 ± 0.1	0.011	0.006	0.02	0.41

Supplemental Table 2. Estimated absolute intracerebral glucose concentrations. Estimations derived using previously published reversible Michaelis-Menten models (Model A, K_T 0.6 mM (6); Model B, K_T 1.1 mM (29) for glucose transport across the blood-brain barrier. Calculations presented as mM, mean ± SEM.

		Estimated brain glucose (mM) (at plasma gluc 5 mM)	Estimated Brain glucose (mM) (at plasma gluc 12 mM)
Lean	Model A	0.8 ± 0.1	2.3 ± 0.2
	Model B	0.7 ± 0.1	2.1 ± 0.2
Obese	Model A	0.6 ± 0.05	1.6 ± 0.1
	Model B	0.4 ± 0.05	1.5 ± 0.1
T2DM	Model A	0.4 ± 0.1	1.3 ± 0.3
	Model B	0.3 ± 0.1	1.4 ±0.1