SUPPLEMENTARY DATA

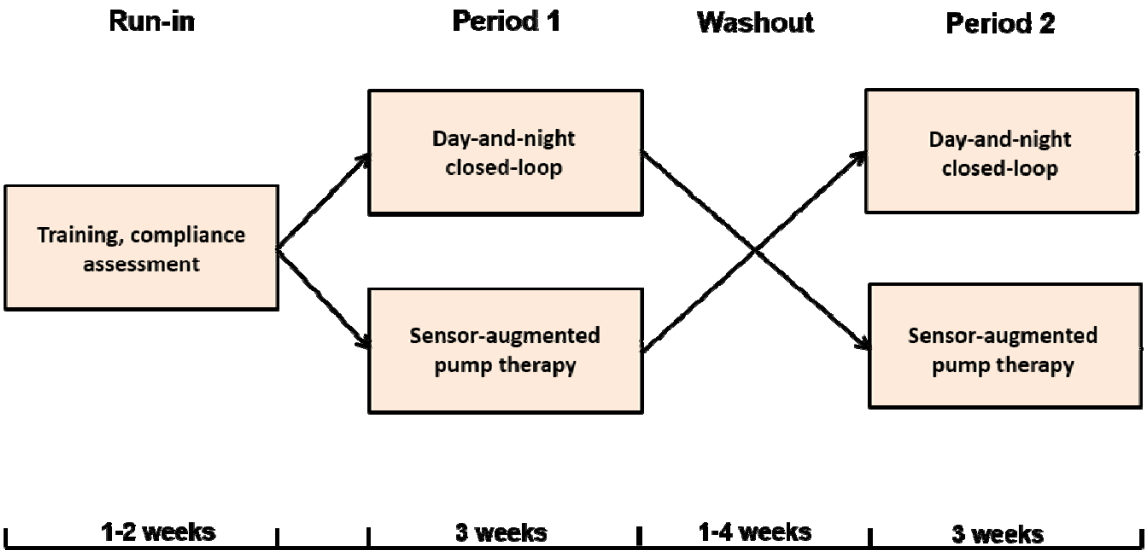
Supplementary Table S1. Baseline characteristics of study participants[a].

No. of subjects	12
Gender (M/F)	(7/5)
Age (years)	14.6±3.1
BMI (kg/m^2)	21.3±4.4
BMI z-score	0.56±1.19
Glycated haemoglobin at screening (%)	8.5±0.7
Glycated haemoglobin at screening (mmol/mol)	69±8
Duration of diabetes (years)	7.8±3.5
Duration on pump (years)	5.5±2.6
Total daily insulin dose (U/kg/day)	0.82±0.18

[a] All C-peptide negative at non-hypoglycaemia (C-peptide less than 33pmol/l at fingerstick glucose equal or greater than 4mmol/l) except for two participants with levels of 61 and 262 pmol/l

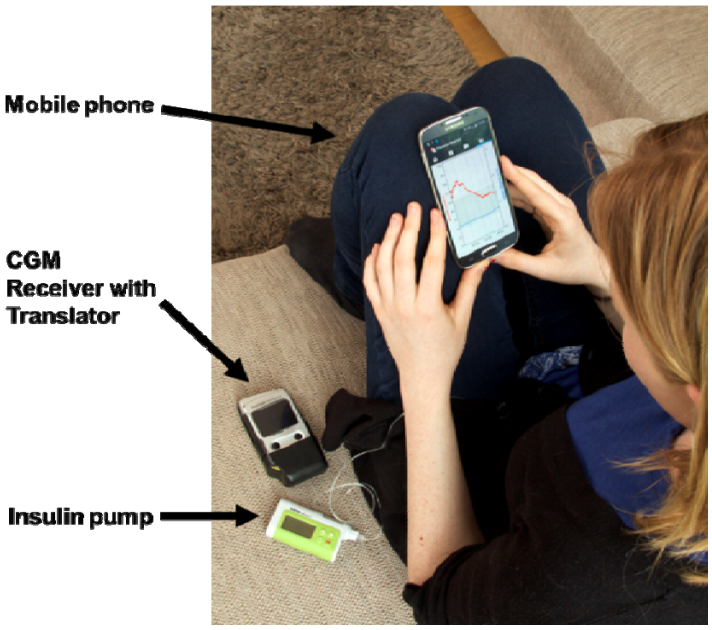
SUPPLEMENTARY DATA

Supplementary Figure S1. Study design.



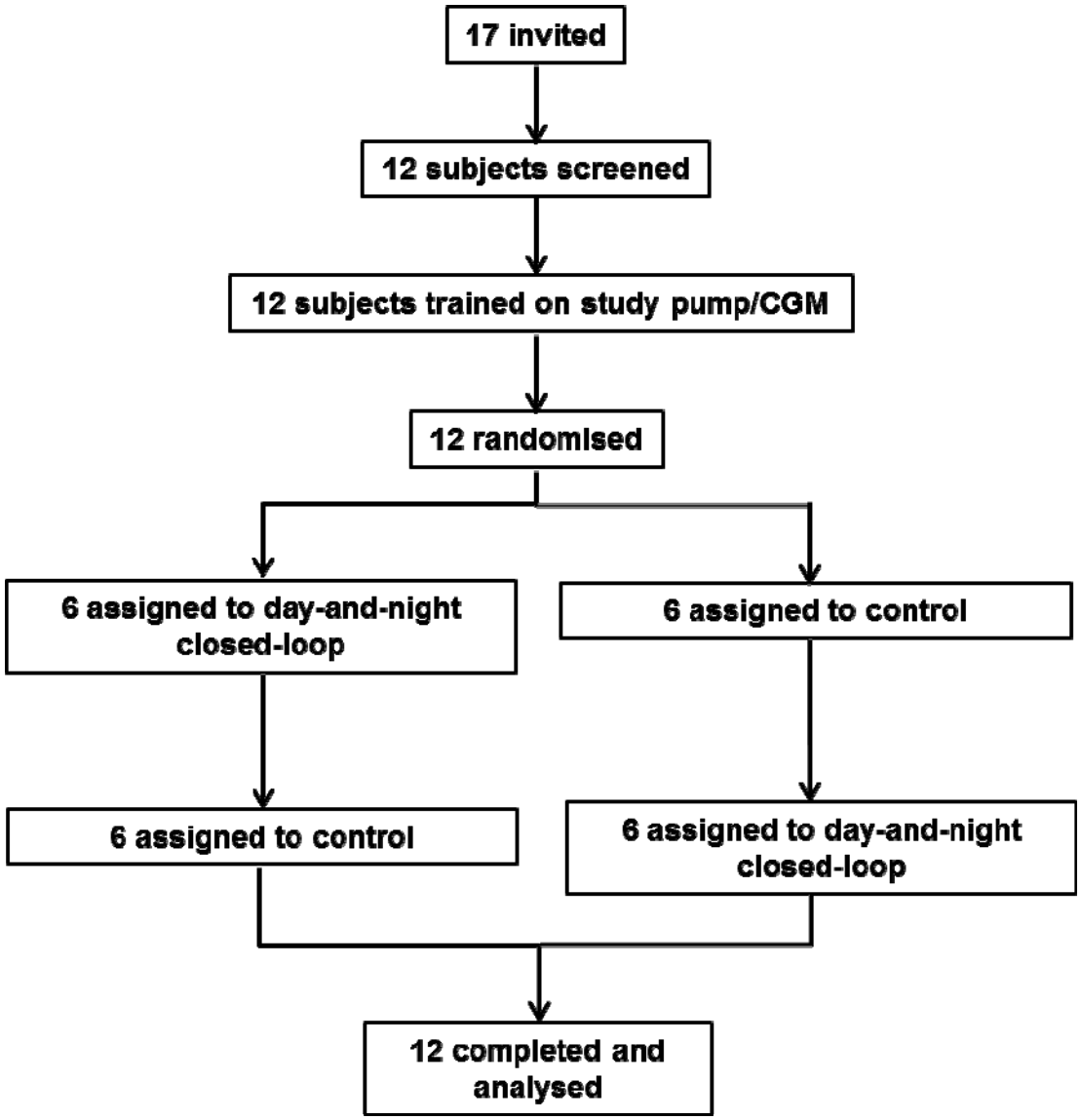
SUPPLEMENTARY DATA

Supplementary Figure S2. Components of Florence D2A automated closed-loop system comprising an Android phone (Galaxy S4, Samsung, South Korea) running control algorithm and communicating wirelessly with Dana Diabecare insulin pump (Sooil, Seoul, South Korea) and translator (Triteq, Hungerford, UK) with inserted Nav2 Receiver (Abbott Diabetes Care, Alameda CA, USA).



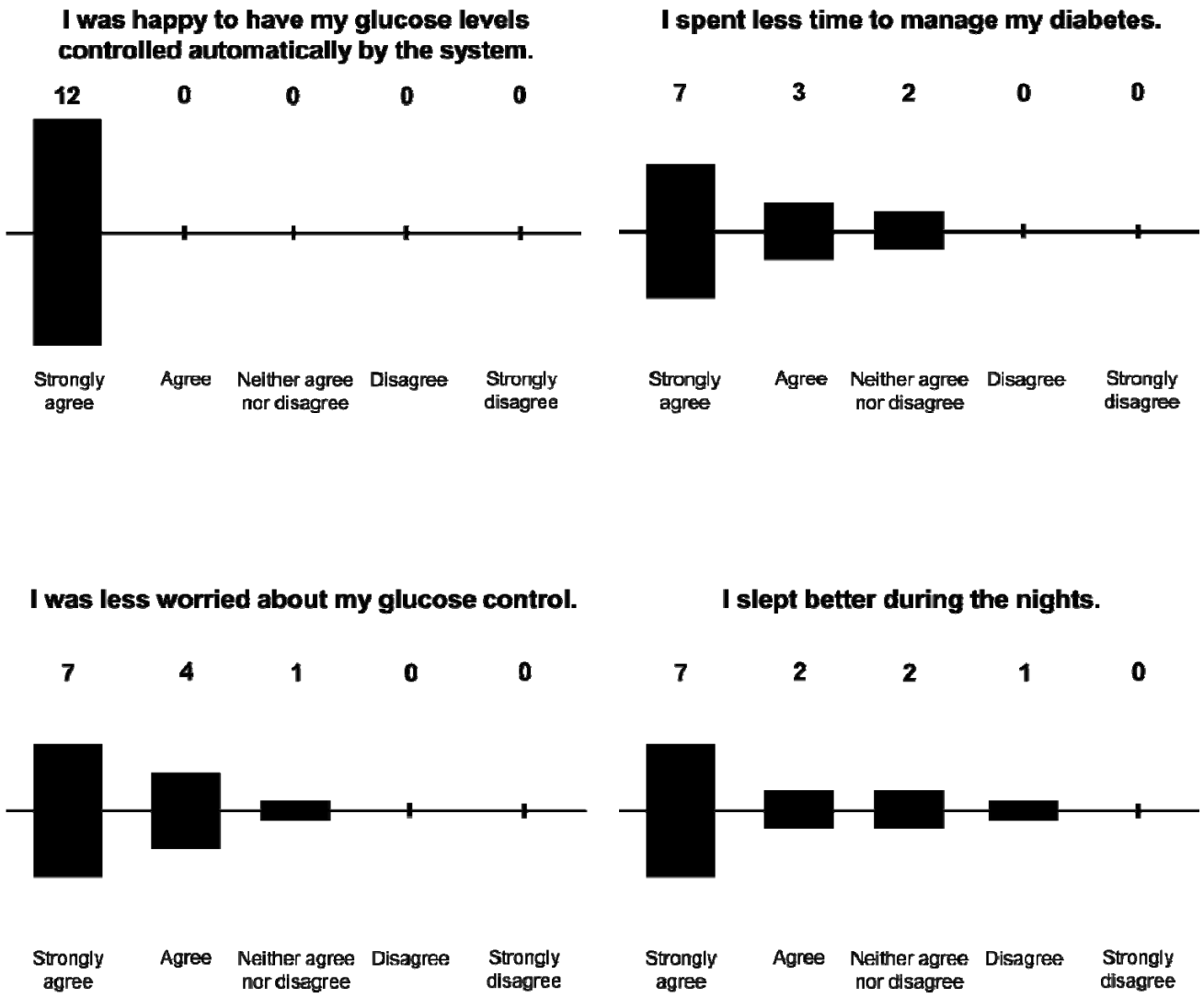
SUPPLEMENTARY DATA

Supplementary Figure S3. Flow of participants through the trial.



SUPPLEMENTARY DATA

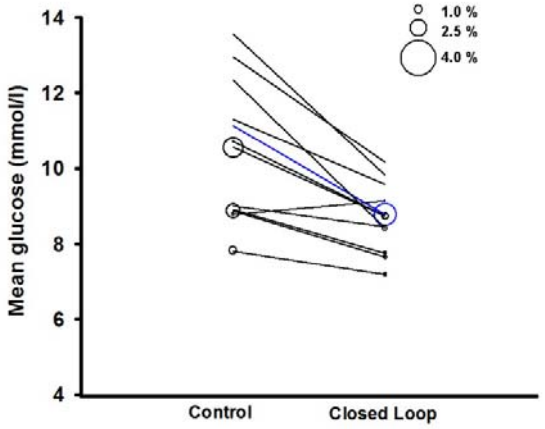
Supplementary Figure S4. Questionnaire results. The numbers at the top of each graph indicate the total number of answers out of 12 responses.



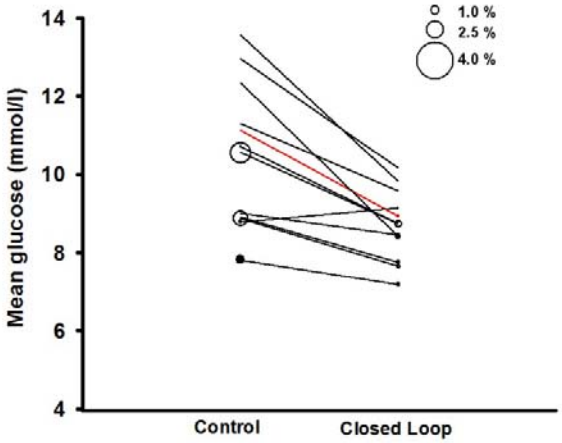
SUPPLEMENTARY DATA

Supplementary Figure S5. Individual values of mean sensor glucose values during closed-loop and control periods. The size of bubble indicates the proportion of time spent with low glucose below 2.8mmol/l. Panel A: Blue line indicates Subject 21 when mean glucose and percentage of time spent below 2.8 mmol/l are calculated using original data. Panel B: Red line indicates Subject 21 when mean glucose and percentage of time spent below 2.8 mmol/l are calculated based on cleaned data with excluded sensor under-reading (erroneously low glucose sensor values; see Figures S6 to S9).

A

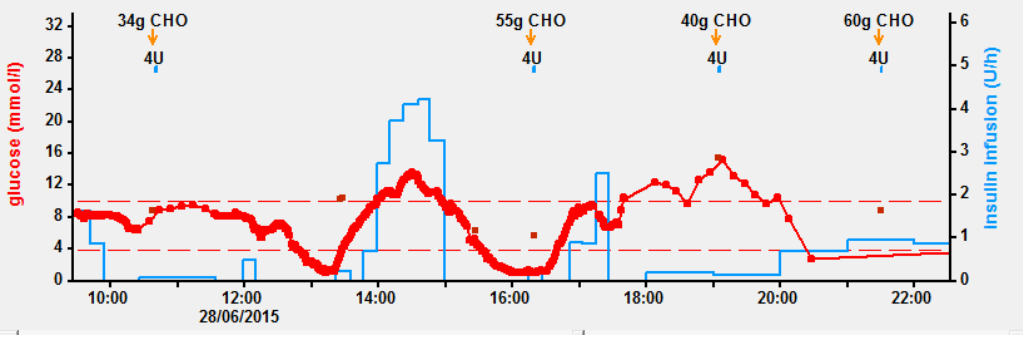


B



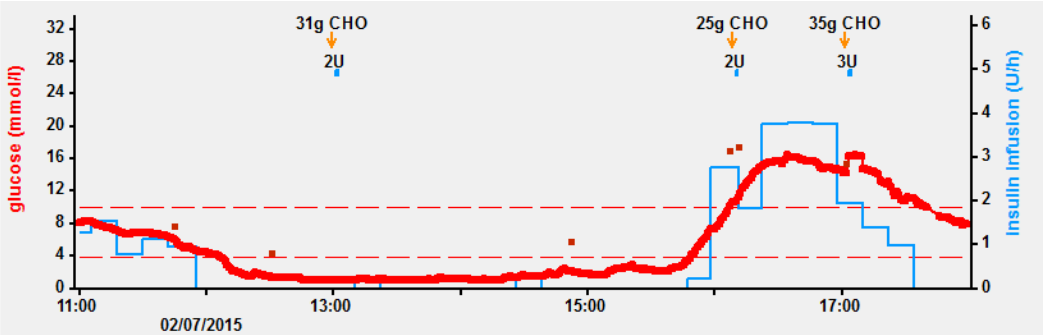
SUPPLEMENTARY DATA

Supplementary Figure S6. Subject 21, 28 June 2015: Sensor under-reading starting at 15:32 and ending at 16:40 (denoted by blue shaded area). Discrepancy noted between capillary blood glucose measurements and sensor glucose levels during this period (at 16:19 capillary glucose 5.7 mmol/l vs sensor glucose 1.0 mmol/l). A period of 01:08 hours was excluded during exploratory analysis.



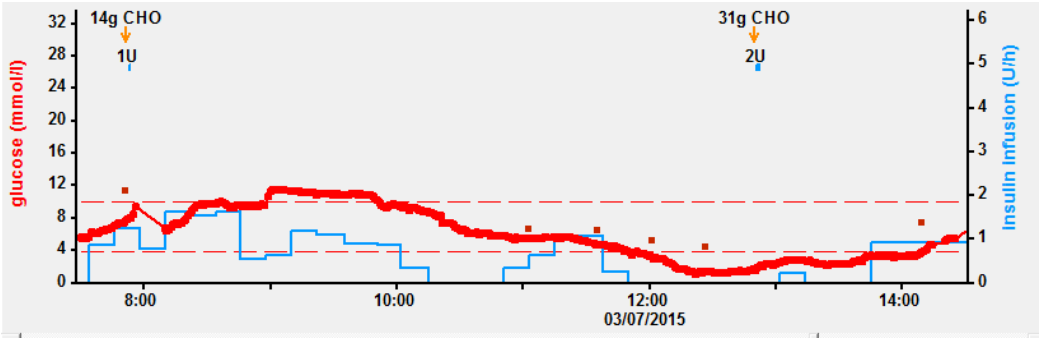
SUPPLEMENTARY DATA

Supplementary Figure S7. Subject 21, 02 July 2015: Sensor under-reading starting at 12:31 and ending at 14:52 (denoted by blue shaded area). Discrepancy noted between capillary blood glucose measurements and sensor glucose levels during this period (at 12:31 capillary glucose 4.4mmol/l vs. sensor glucose 1.4 mmol/l; at 14.52 capillary glucose 5.8 mmol/l vs. sensor glucose 2.2 mmol/l). A period of 02:21 hours was excluded during exploratory analysis.



SUPPLEMENTARY DATA

Supplementary Figure S8. Subject 21, 03 July 2015: Sensor under-reading starting at 12:01 and ending at 14:09 (denoted by blue shaded area). Discrepancy noted between capillary blood glucose measurements and sensor glucose levels during this period (at 12:01 capillary glucose 5.3 mmol/l vs. sensor glucose 3.2 mmol/l; at 12.26 capillary glucose 4.4 mmol/l vs. sensor glucose 1.3 mmol/l; at 14.09 capillary glucose 7.5 mmol/l vs. sensor glucose 3.8 mmol/l). A period of 02:08 hours was excluded during exploratory analysis.



SUPPLEMENTARY DATA

Supplementary Figure S9. Subject 21, 05 July 2015: Sensor under-reading starting at 21:35 and ending at 00:30 (denoted by blue shaded area). Discrepancy noted between capillary blood glucose measurements and sensor glucose levels during this period (at 21.35 capillary glucose 4.0 mmol/l vs. sensor glucose 2.5 mmol/l; at 22:07 capillary glucose 5.4 mmol/l vs. sensor glucose 1.0 mmol/l; at 22:38 capillary glucose 4.1 mmol/l vs. sensor glucose 1.0mmol/l; at 22:52 capillary glucose 4.6 mmol/l vs sensor glucose 1.0 mmol/l; at 23:19 capillary glucose 6.7 mmol/l vs. sensor glucose 1.1 mmol/l; at 00:21 capillary glucose 10.7 mmol/l vs sensor glucose 1.1 mmol/l). A period of 02:55 hours was excluded during exploratory analysis.