Supplementary Table S1: Participant characteristics at baseline

	Total (n=23)	Male (n=13)	Female (n=10)
Participant Characteristics			
Age; mean (range)	62 ± 8	60 ± 9	64 ± 5
BMI (kg/m^2)*	32.7 ± 3.5	32.5 ± 3.2	32.8 ± 3.9
Weight (kg)	94 ± 13.4	99.9 ± 13.4	86.7 ± 9.4 †
Waist circumference (cm)	111.0 ± 8.9	114.6 ± 8.6	106.2 ± 6.7 †
Waist to hip ratio	1.0 ± 0.1	1.1 ± 0.1	0.9 ± 0.1 †
Neck (cm)	39.7 ± 4.8	43.0 ± 4.2	36.0 ± 1.9 †
SBP (mmHg)	128 ± 9	125 ± 9	131 ± 9 †
DBP (mmHg)	73 ± 8	72 ± 8	74 ± 7
T2D duration (yrs)	10 ± 7	10 ± 7	11 ± 6
Metabolic parameters			
Glycated haemoglobin (%)	7.6 ± 0.8	7.8 ± 0.7	7.3 ± 0.7
Fasting glucose (mmol/L)‡	8.2 ± 1.5	8.2 ± 1.7	8.1 ± 1.1
Fasting insulin (pmol/L)‡	76.2 ± 43.5	81.8 ± 49.1	69.0 ± 34.5
Fasting triglycerides (mmol/L)‡	1.7 ± 0.6	1.8 ± 0.6	1.5 ± 0.5 †
HOMA2-IR	1.9 ± 1.0	2.0 ± 1.1	1.7 ± 0.9
HOMA-%β	56.6 ± 31.5	61.1 ± 36.8	50.8 ± 22.3
Number of diabetes therapies, n (%)			
Single	7 (30)	2 (15)	5 (50)
Dual	10 (44)	6 (46)	4 (40)
Triple	6 (26)	5 (38)	1 (10)

BMI, Body Mass Index; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; T2D, Type 2 Diabetes; SD, Standard Deviation. Data presented as mean ± SD unless otherwise stated.
*****Calculated as body mass in kilograms divided by height in metres squared.
†Statistically significant difference; $P<0.05$, between males and females.
‡Calculated as the mean fasting concentration of two time points (-1 and 0 h) at the beginning of testing days

Supplementary Table S2: Overview and comparison of outcomes for total, positive incremental and net incremental area under the curve, and mean analyte values

	SIT	SRA3	SRA6
tAUC			
Glucose mmol·h·L^{-1}*	84.9 (80.3, 89.8)	85.4 (80.7, 90.3)	80.7 (76.3, 85.3)†
Insulin pmol·h·L^{-1}*	1982 (1679, 2340)	1870 (1584, 2207)	1783 (1510, 2105)†
Triglycerides mmol·h·L^{-1}	16.7 (15.7, 17.6)	17.1 (16.1, 18.0)	16.7 (15.7, 17.6)
Positive iAUC			
Glucose mmol·h·L^{-1}*	19.7 (15.6, 24.7)	20.3 (16.2, 25.6)	15.4 (12.3, 19.4)†‡
Insulin pmol·h·L^{-1}*	1414 (1117, 1790)	1306 (1032, 1653)	1233 (974, 1560)†
Triglycerides mmol·h·L^{-1}	3.2 (2.3, 4.2)	3.5 (2.6, 4.4)	3.1 (2.2, 4.0)
Net iAUC			
Glucose mmol·h·L^{-1}	21.4 (16.9, 25.8)	22.1 (17.7, 26.6)	17.0 (12.5, 21.4)†‡
Insulin pmol·h·L^{-1}*	1411 (1128, 1767)	1301 (1040, 1629)	1229 (982, 1538)†
Triglycerides mmol·h·L^{-1}	3.0 (2.1, 3.9)	3.4 (2.5, 4.3)	3.0 (2.1, 3.9)
Mean Analyte Values			
Glucose mmol·L^{-1}	10.9 (10.3, 11.5)	11.0 (10.4, 11.6)	10.3 (9.7, 11.0)†‡
Insulin pmol·L^{-1}	300 (260, 341)	286 (246, 327)	265 (224, 306)
Triglycerides mmol·L^{-1}	2.1 (2.0, 2.2)	2.1 (2.0, 2.2)	2.1 (1.9, 2.2)

Data are presented as mean (95% CI) *Data is displayed as exponents of the natural log. †SRA6 significantly different to SIT ($P < 0.05$). ‡SRA6 significantly different to SRA3 ($P < 0.05$). Mean analyte values are presented as the average of 16 measurements taken across each 8 h trial day.

Supplementary Table S3: Meal-specific 3.5 h net incremental area under the curve values

	SIT	SRA3	SRA6
Post-breakfast $iAUC_{net}$			
Glucose $mmol \cdot h \cdot L^{-1}$	11.2 (9.0, 13.4)	11.6 (9.4, 13.8)	9.6 (7.4, 11.8)‡
Insulin $pmol \cdot h \cdot L^{-1}$*	616 (475, 799)	632 (487, 819)	596 (460, 773)
Triglycerides $mmol \cdot h \cdot L^{-1}$	0.4 (0.2, 0.6)	0.4 (0.2, 0.6)	0.5 (0.3, 0.7)
Post-lunch $iAUC_{net}$			
Glucose $mmol \cdot h \cdot L^{-1}$	12.0 (7.1, 16.8)	12.5 (7.7, 17.3)	7.8 (2.9, 12.6)†‡
Insulin $pmol \cdot h \cdot L^{-1}$*	958 (707, 1300)	796 (587, 1080)†	796 (587, 1079)‡
Triglycerides $mmol \cdot h \cdot L^{-1}$	3.0 (2.1, 4.0)	3.4 (2.5, 4.4)	3.0 (2.0, 4.0)

Data are presented as mean (95% CI) *Data are displayed as exponents of the natural log. †Significantly different to SIT ($P < 0.05$). ‡SRA6 significantly different to SRA3 ($P < 0.05$)

Supplementary Table S4: Type and combinations medications used by participants

Medication	n (%) of the 23 participants
Metformin	21 (91)
DPP4	7 (30)
Sulfonylureas	5 (22)
$SGLT2^{+}$	8 (35)
GLP agonists	4 (17)
Combinations; n (%)	
Single; 7 (30)	
Metformin only	6 (26)
Sulfonylurea only	1 (4)
Dual; 10 (44)	
Metformin + DPP4	2 (9)
Metformin + Sulfonylurea	2 (9)
Metformin + $SGLT2^{+}$	2 (9)
Metformin + GLP agonist	2 (9)
DPP4 + $SGLT^{+}$	1 (4)
Triple; 6 (26)	
Metformin + DPP4 + $SGLT2^{+}$	2 (9)
Metformin + $SGLT2^{+}$ + GLP agonist	2 (9)
Metformin + DPP4 + Sulfonylurea	1 (4)
Metformin + Sulfonylurea + $SGLT2^{+}$	1 (4)
Other treatment related medications, n (%)	
ACE inhibitor or ARB	12 (52)
Calcium channel blocker	3 (13)
Beta blocker	3 (13)
Diuretic and other	2 (9)
Statin	14 (61)

Supplementary Table S5: Total time (mins) spent sitting, standing and stepping from ActivPAL inclinometer during each experimental condition

During condition	SIT	SRA3	SRA6
Sitting time	459 ± 21	424 ± 16*	421 ± 34*
Standing time	11 ± 15	29 ± 11*	34 ± 28*
Stepping time	3 ± 7	19 ± 9*	21 ± 12*

All data expressed as means ± SD. *Denotes a statistically significant difference from SIT ($P < 0.001$)

Supplementary Table S6: Glucose, Insulin and Triglyceride $iAUC_{net}$ results with additional adjustment for activity data

	SIT	SRA3	SRA6
Base Model†			
Glucose mmol·h·L^{-1}	21.4 (16.9, 25.8)	22.1 (17.7, 26.6)	17.0 (12.5, 21.4)*
Insulin pmol·h·L^{-1}	1411 (1128, 1767)	1301 (1040, 1629)	1229 (982, 1538)*
Triglycerides mmol·h·L^{-1}	3.0 (2.1, 3.9)	3.4 (2.5, 4.3)	3.0 (2.1, 3.9)
Adjusted for pre-experimental stepping time			
Glucose mmol·h·L^{-1}	20 (16, 24)	20 (16, 24)	15 (11, 19)
Insulin pmol·h·L^{-1}	1281 (944, 1547)	1208 (944, 1547)	1137 (888, 1456)
Triglycerides mmol·h·L^{-1}	3.2 (2.3, 4.2)	3.7 (2.7, 4.7)	3.0 (2.0, 3.9)
Adjusted for restricted period stepping time			
Glucose mmol·h·L^{-1}	23 (18, 27)	22 (17, 26)	17 (13, 21)*
Insulin pmol·h·L^{-1}	1307 (1126, 1517)	1218 (1046, 1420)	1215 (1047, 1409)
Triglycerides mmol·h·L^{-1}	3.3 (2.3, 4.2)	3.0 (2.0, 4.0)	2.9 (1.9, 3.8)
Adjusted for pre-experimental MVPA (ActivPAL derived)‡			
Glucose mmol·h·L^{-1}	22 (17, 27)	22 (17, 27)	17 (12, 22)
Insulin pmol·h·L^{-1}	1265 (1084, 1476)	1258 (1073, 1475)	1216 (1050, 1408)
Triglycerides mmol·h·L^{-1}	3.1 (2.0, 4.1)	3.2 (2.1, 4.3)	2.8 (1.8, 3.9)
Adjusted for restricted period MVPA (ActivPAL derived)‡			
Glucose mmol·h·L^{-1}	23 (19, 27)	22 (17, 26)	17 (13, 21)*
Insulin pmol·h·L^{-1}	1265 (1084, 1476)	1258 (1073, 1475)	1216 (1050, 1408)
Triglycerides mmol·h·L^{-1}	3.1 (2.0, 4.1)	3.2 (2.1, 4.3)	2.8 (1.8, 3.9)
Adjusted for pre-experimental MVPA (Actigraph derived)§			
Glucose mmol·h·L^{-1}	21 (17, 26)	23 (18, 27)	17 (13, 22)
Insulin pmol·h·L^{-1}	1463 (1141, 1876)	1377 (1074, 1766)	1293 (1009, 1659)*
Triglycerides mmol·h·L^{-1}	3.1 (2.1, 4.0)	3.5 (2.5, 4.5)	3.0 (2.1, 4.0)
Adjusted for restricted period MVPA (Actigraph derived)§			
Glucose mmol·h·L^{-1}	24 (19, 30)	22 (17, 26)	15 (10, 20)*
Insulin pmol·h·L^{-1}	1478 (1222, 1786)	1274 (1094, 1482)	1340 (1111, 1616)
Triglycerides mmol·h·L^{-1}	2.9 (1.8, 3.9)	3.0 (2.2, 3.9)	2.9 (1.9, 4.0)

Data are means (95% Confidence Interval). *Denotes a statistically significant difference from SIT (P<0.05). †Base model adjusted for treatment order, average of the -1 and 0 h fasting samples, age, sex and waist circumference. ‡ActivPAL derived MVPA was calculated as time spent stepping at a cadence of >100steps/min. §Wrist-worn Actigraph data were analysed using the GGIR package and time spent in MVPA was identified using Hildebrand Euclidean Norm Minus One (ENMO) cutpoints of 100.6 for moderate and 428.8mg for vigorous physical activity.